Case study of “Shiv Shakti Rice Mill”

Final Term report for the BDM capstone Project

Submitted by

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Contents:

1 Executive Summary:

“Shiv Shakti Mill Store” is a mid-sized Kirana store, started by Mr. Ramesh Yadav in early 2017, currently encountering challenges in terms of profit and inventory management which is having an indirect impact on the store's net profit and sales. The aim of the proposed capstone project is focused on the objective to understand the complexities of managing or controlling inventory/goods flow, enhancing the sales and formulating marketing strategies that increase net profit and sales of the store.

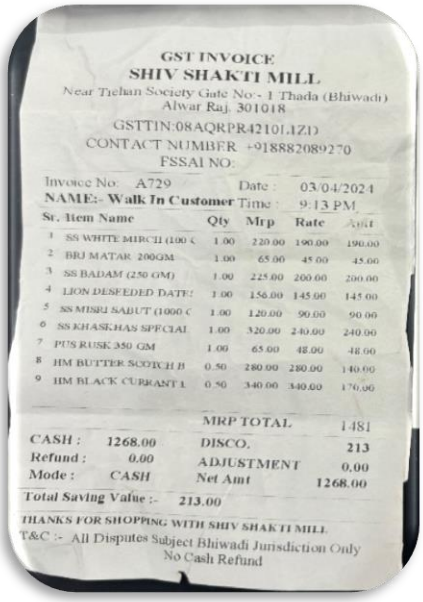
Considering objective, primary goal of our capstone project will be to increase net profit, optimization and checking inventory to determine the optimum purchase time and manage goods flow and expenditure as well. To achieve this, the project will necessitate an in-depth analysis of the sales data along with fluctuation in purchase price over the month. Identifying the gaps and areas of improvement in the current strategy will be a critical aspect of this project. The report will also include in depth analysis of the sales data to identify patterns and trends in the sales. This analysis will allow us to identify the best and worst performing items, enabling us to understand and formulate marketing strategies to improve net sales leading to an increase in net profit. After a thorough analysis, the project report will focus on recommendations to combat the problem areas as identified above.

To analyse the sales data and make indicated business decisions, I will be utilizing various Excel tools such as pivot tables, bar graphs, and line graphs etc ... that can provide valuable graphical representations. These tools enable a visual representation of the sales data, making it easier to identify trends, patterns, and key insights. By analysing the outperforming and underperforming products using these Excel tools, recommendation, marketing strategy and data-driven decisions to optimize revenue generation can be formulated.

2 Detailed Explanation of Analysis Process/Method:

a) Data Analysis for sales and expenditure:

As per aforesaid statement, MS Excel is the main tool which will be used for the analysis. First, sales data is collected in an unstructured format along with prices of each product from "Shiv Shakti Mill Store" over the period of approx. 31 days.



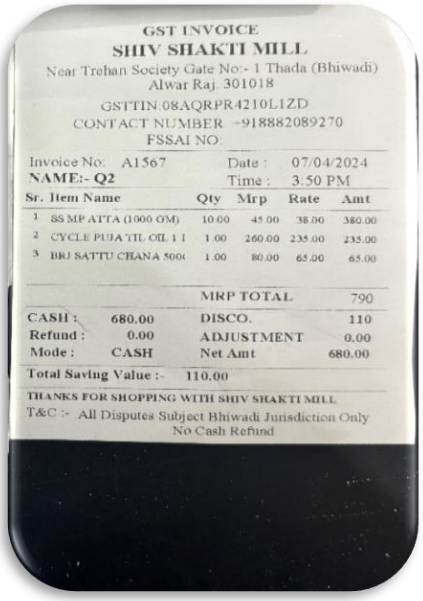
GST INVOICE
SHIV SHAKTI MILL
Near Trehan Society Gate No:- 1 Thada (Bhiwadi)
Alwar Raj. 301018
GSTTIN:08AQRPR4210L1ZD
CONTACT NUMBER +918882089270
FSSAI NO:

Invoice No: A729 Date : 03/04/2024
NAME:- Walk In Customer Time : 9:13 PM

Sr.	Item Name	Qty	Mrp	Rate	Amt
1	SS WHITE MIRCH (100 G	1.00	220.00	190.00	190.00
2	BRJ MATAR 200GM	1.00	65.00	45.00	45.00
3	SS BADAM (250 GM)	1.00	225.00	200.00	200.00
4	LION DESEEDED DATE	1.00	156.00	145.00	145.00
5	SS MISRI SABUT (1000 G	1.00	120.00	90.00	90.00
6	SS KHASKHAS SPECIAL	1.00	320.00	240.00	240.00
7	PUS RUSK 350 GM	1.00	65.00	48.00	48.00
8	HM BUTTER SCOTCH B	0.50	280.00	280.00	140.00
9	HM BLACK CURRANT L	0.50	340.00	340.00	170.00

MRP TOTAL 1481
CASH : 1268.00 DISCO. 213
Refund : 0.00 ADJUSTMENT 0.00
Mode : CASH Net Amt 1268.00
Total Saving Value :- 213.00

THANKS FOR SHOPPING WITH SHIV SHAKTI MILL
T&C :- All Disputes Subject Bhiwadi Jurisdiction Only
No Cash Refund



GST INVOICE
SHIV SHAKTI MILL
Near Trehan Society Gate No:- 1 Thada (Bhiwadi)
Alwar Raj. 301018
GSTTIN:08AQRPR4210L1ZD
CONTACT NUMBER +918882089270
FSSAI NO:

Invoice No: A1567 Date : 07/04/2024
NAME:- Q2 Time : 3:50 PM

Sr.	Item Name	Qty	Mrp	Rate	Amt
1	SS MP ATTA (1000 GM)	10.00	45.00	38.00	380.00
2	CYCLE PUJA TIL OIL 1 L	1.00	260.00	235.00	235.00
3	BRJ SATTU CHANA 500(	1.00	80.00	65.00	65.00

MRP TOTAL 790
CASH : 680.00 DISCO. 110
Refund : 0.00 ADJUSTMENT 0.00
Mode : CASH Net Amt 680.00
Total Saving Value :- 110.00

THANKS FOR SHOPPING WITH SHIV SHAKTI MILL
T&C :- All Disputes Subject Bhiwadi Jurisdiction Only
No Cash Refund

Data storage way

The unstructured store data inserted into excel and basic data pre-processing task such as typing errors, improper data standard, sorting etc. are done.

- The pre-processed sales data have a total of 31 columns where 15 columns represent each item's sales quantity along with the date (1 column) and 10 more represent each item's selling price on the given day.

	SALES														
DATE	RICE	FLOUR	MAIDA	SUZI	TOOR DAL	NAMKEEN	BISCUIT	EGG	SUGAR	COOKING OIL	GHEE	MILK & DAIRY	DRY FRUITS	BREADS	SALT
01-02-2024	70	55	8	8	10	32	8	68	42	29	5	32	2	10	6
02-02-2024	61	70	6	6	16	21	10	102	60	35	6	41	1	5	14
03-02-2024	110	140	9	9	10	20	11	65	29	32	8	48	6	6	8
04-02-2024	60	41	5	5	12	15	14	69	38	21	3	36	2	8	9
05-02-2024	66	43	10	10	9	10	9	84	12	28	6	39	3	5	10
06-02-2024	35	40	5	5	8	12	5	12	26	26	9	42	4	11	17
07-02-2024	60	62	6	6	8	15	5	66	23	31	3	44	8	8	15
08-02-2024	40	80	8	8	8	12	6	58	45	21	3	60	2	6	6
09-02-2024	60	46	10	10	6	20	5	102	62	32	5	35	6	8	7
10-02-2024	95	115	11	11	8	20	10	65	53	22	6	43	5	12	6
11-02-2024	48	61	19	12	6	18	5	75	43	18	6	55	2	10	11
12-02-2024	48	78	10	10	8	12	10	102	19	20	3	48	1	5	14
13-02-2024	50	59	15	8	6	13	6	22	21	14	2	43	2	8	10
14-02-2024	106	113	9	9	5	14	8	85	22	19	6	56	1	3	8
15-02-2024	42	35	8	8	6	12	6	69	60	22	2	49	5	7	16
16-02-2024	40	42	6	6	6	20	9	86	39	21	1	50	3	11	10
17-02-2024	105	68	10	10	4	24	6	91	48	10	3	56	2	15	8
18-02-2024	40	45	8	8	4	22	3	89	29	16	2	48	1	5	6
19-02-2024	36	69	9	9	6	15	8	100	66	21	5	42	4	8	4
20-02-2024	38	85	10	10	4	25	6	28	35	27	2	39	1	4	3
21-02-2024	48	91	8	8	8	20	9	81	26	21	1	61	1	6	8
22-02-2024	73	68	10	10	16	15	3	92	45	25	9	49	5	12	6
23-02-2024	69	56	17	11	12	10	6	105	43	23	5	55	8	10	10
24-02-2024	125	140	10	10	10	15	9	66	28	35	3	42	6	7	4
25-02-2024	90	59	18	10	18	12	5	79	46	19	6	51	10	3	5
26-02-2024	70	67	18	6	9	16	9	89	33	35	3	48	1	5	17
27-02-2024	75	54	11	17	4	19	3	15	41	22	2	56	6	8	10
28-02-2024	71	59	12	10	3	20	7	77	50	32	5	39	2	4	2
29-02-2024	60	88	10	7	5	17	6	90	26	29	9	46	3	6	5
01-03-2024	45	78	9	6	10	20	3	102	19	25	3	51	4	7	7
02-03-2024	130	132	12	9	5	15	5	90	22	29	8	61	1	10	6

SELLING PRICE													
RICE	FLOUR	MAIDA	SUZI	TOOR DAL	NAMKEEN	BISCUIT	EGG	SUGAR	COOKING OIL	GHEE	MILK & DAIRY	DRY FRUITS	BREADS	SALT
₹51	₹38	₹40	₹54	₹201	₹110	₹102	₹7	₹41	₹129	₹601	₹60	₹900	₹45	₹25
₹51	₹38	₹40	₹54	₹202	₹110	₹102	₹7	₹41	₹129	₹601	₹60	₹900	₹45	₹25
₹51	₹38	₹40	₹53	₹202	₹110	₹102	₹7	₹41	₹129	₹601	₹60	₹900	₹45	₹25
₹51	₹38	₹41	₹56	₹202	₹110	₹102	₹7	₹41	₹130	₹601	₹60	₹900	₹45	₹25
₹52	₹38	₹41	₹56	₹205	₹110	₹102	₹7	₹41	₹130	₹601	₹60	₹900	₹45	₹25
₹53	₹40	₹42	₹56	₹205	₹110	₹102	₹7	₹42	₹130	₹601	₹60	₹900	₹45	₹25
₹53	₹40	₹41	₹58	₹205	₹110	₹102	₹7	₹42	₹130	₹601	₹60	₹900	₹45	₹25
₹53	₹40	₹41	₹58	₹205	₹110	₹102	₹7	₹42	₹130	₹601	₹60	₹900	₹45	₹25
₹52	₹40	₹46	₹58	₹210	₹110	₹102	₹7	₹42	₹130	₹601	₹60	₹900	₹45	₹25
₹52	₹40	₹46	₹58	₹210	₹110	₹102	₹7	₹42	₹130	₹601	₹60	₹900	₹45	₹25
₹52	₹39	₹46	₹58	₹210	₹110	₹102	₹7	₹42	₹130	₹601	₹60	₹900	₹45	₹25
₹50	₹39	₹46	₹60	₹210	₹110	₹102	₹7	₹42	₹130	₹605	₹60	₹900	₹45	₹25
₹50	₹40	₹45	₹60	₹209	₹110	₹102	₹7	₹42	₹130	₹605	₹60	₹900	₹45	₹25
₹50	₹40	₹43	₹60	₹209	₹110	₹102	₹7	₹42	₹130	₹605	₹60	₹900	₹45	₹25
₹51	₹41	₹43	₹60	₹209	₹110	₹102	₹7	₹42	₹130	₹605	₹60	₹905	₹45	₹25
₹51	₹41	₹43	₹61	₹209	₹110	₹102	₹7	₹42	₹130	₹605	₹60	₹905	₹45	₹25
₹51	₹41	₹41	₹60	₹210	₹110	₹102	₹7	₹42	₹132	₹605	₹60	₹905	₹45	₹25
₹52	₹41	₹41	₹61	₹210	₹110	₹103	₹7	₹42	₹132	₹605	₹61	₹905	₹45	₹25
₹52	₹40	₹41	₹61	₹210	₹110	₹103	₹7	₹41	₹132	₹605	₹61	₹905	₹45	₹25
₹52	₹40	₹45	₹61	₹210	₹113	₹103	₹7	₹41	₹132	₹605	₹61	₹905	₹45	₹26
₹52	₹40	₹45	₹59	₹208	₹113	₹103	₹7	₹41	₹132	₹605	₹61	₹905	₹45	₹26
₹52	₹38	₹42	₹59	₹208	₹113	₹103	₹6	₹41	₹132	₹605	₹61	₹905	₹45	₹26
₹50	₹38	₹43	₹59	₹208	₹113	₹103	₹6	₹41	₹132	₹605	₹61	₹905	₹45	₹26
₹50	₹40	₹43	₹59	₹208	₹113	₹103	₹6	₹41	₹132	₹605	₹60	₹905	₹45	₹26
₹50	₹40	₹43	₹60	₹205	₹113	₹103	₹6	₹41	₹132	₹604	₹60	₹905	₹46	₹26
₹52	₹40	₹42	₹60	₹205	₹113	₹103	₹6	₹41	₹130	₹604	₹60	₹901	₹46	₹26
₹52	₹39	₹42	₹60	₹210	₹113	₹103	₹6	₹41	₹130	₹604	₹60	₹901	₹46	₹26
₹52	₹39	₹46	₹60	₹210	₹115	₹100	₹6	₹41	₹130	₹604	₹60	₹901	₹46	₹26
₹52	₹40	₹46	₹58	₹210	₹115	₹100	₹6	₹42	₹130	₹604	₹60	₹901	₹46	₹26
₹52	₹40	₹46	₹58	₹210	₹115	₹100	₹6	₹42	₹130	₹604	₹60	₹901	₹46	₹26
₹52	₹40	₹46	₹58	₹210	₹115	₹100	₹6	₹42	₹130	₹604	₹60	₹901	₹46	₹26

- Using sales and selling price revenue for the day, average sales, selling price and total revenue can be calculated by formula:

$$Revenue = Selling\ price * Sales$$

$$Total\ Revenue = \sum_{i=0} R_i$$

where R_i = Revenue made at i^{th} day

- In the same manner, purchase data has been collected for every item's which consists of purchase quantity and purchase price, using which expenditure is calculated on each item.

	PUCHASE VOLUME														
DATE	RICE	FLOUR	MAIDA	SUZI	TOOR DAL	NAMKEEN	BISCUIT	EGG	SUGAR	COOKING OIL	GHEE	MILK & DAIRY	DRY FRUITS	BREADS	SALT
01-02-2024	200	0	0	0	100	100	0	0	100	100	10	60	0	5	0
02-02-2024	0	300	0	0	0	0	0	150	150	0	0	50	0	5	25
03-02-2024	0	0	0	0	0	0	0	100	0	50	0	50	10	7	75
04-02-2024	200	0	50	50	0	0	0	0	0	0	10	45	0	6	0
05-02-2024	0	0	0	0	0	0	0	120	0	0	0	60	0	6	0
06-02-2024	0	200	0	0	0	0	0	180	100	100	10	65	0	8	0
07-02-2024	0	0	0	0	0	50	50	0	0	0	10	55	10	9	0
08-02-2024	0	0	0	0	0	0	50	0	0	100	0	50	0	10	0
09-02-2024	0	0	0	0	0	150	0	120	100	0	10	40	0	8	0
10-02-2024	300	0	50	50	0	0	0	0	0	0	0	50	10	10	0
11-02-2024	0	200	0	0	0	0	0	150	150	0	10	40	0	8	50
12-02-2024	200	100	0	0	0	0	0	150	100	100	10	50	0	9	0
13-02-2024	0	60	0	0	0	0	0	0	0	0	0	30	0	8	0
14-02-2024	0	0	0	0	0	0	0	0	0	0	0	40	5	8	0
15-02-2024	0	0	0	0	0	0	0	0	0	0	10	50	0	9	0
16-02-2024	200	0	0	0	50	0	0	120	0	0	0	55	5	8	50
17-02-2024	0	0	0	0	0	50	0	150	0	0	0	50	0	8	0
18-02-2024	0	300	50	20	0	0	0	300	100	100	0	40	10	8	0
19-02-2024	0	0	0	0	0	0	0	0	0	0	0	40	0	6	0
20-02-2024	0	0	0	50	0	0	50	0	0	0	10	60	0	8	0
21-02-2024	200	50	0	0	0	50	0	0	0	0	0	40	5	8	0
22-02-2024	0	200	0	0	0	0	0	150	100	100	0	40	0	8	25
23-02-2024	0	0	50	40	0	0	0	0	100	0	10	40	10	7	0
24-02-2024	0	0	0	0	50	50	0	120	0	0	0	50	5	6	0
25-02-2024	200	100	20	0	0	0	0	0	0	0	0	45	10	6	25
26-02-2024	0	500	50	0	0	50	0	120	100	100	20	50	10	8	0
27-02-2024	0	0	0	0	0	0	0	0	0	0	0	45	0	6	0
28-02-2024	0	0	0	40	50	0	50	120	100	0	10	40	10	8	0
29-02-2024	100	0	0	0	0	0	0	120	0	0	0	40	0	6	10
01-03-2024	0	0	0	0	0	0	0	0	0	0	0	40	0	8	0
02-03-2024	0	0	0	0	0	0	0	120	0	0	0	45	0	10	0

PURCHASE COST														
RICE	FLOUR	MAIDA	SUZI	TOOR DAL	NAMKEEN	BISCUIT	EGG	SUGAR	COOKING OIL	GHEE	MILK & DAIRY	DRY FRUITS	BREADS	SALT
₹48	₹34	₹37	₹50	₹190	₹100	₹90	₹6	₹38	₹119	₹530	₹57	₹750	₹42	₹23
₹48	₹35	₹37	₹50	₹191	₹100	₹90	₹6	₹38	₹119	₹530	₹57	₹750	₹42	₹23
₹48	₹35	₹37	₹50	₹191	₹100	₹90	₹6	₹38	₹119	₹530	₹57	₹750	₹42	₹23
₹48	₹35	₹38	₹52	₹191	₹100	₹90	₹6	₹38	₹120	₹530	₹57	₹750	₹42	₹23
₹49	₹35	₹38	₹52	₹193	₹100	₹90	₹6	₹38	₹120	₹530	₹57	₹750	₹42	₹23
₹49	₹35	₹39	₹52	₹193	₹100	₹90	₹6	₹39	₹120	₹530	₹57	₹750	₹42	₹23
₹49	₹36	₹38	₹54	₹194	₹100	₹90	₹6	₹39	₹120	₹530	₹57	₹750	₹42	₹23
₹49	₹36	₹38	₹54	₹194	₹100	₹90	₹6	₹39	₹120	₹530	₹57	₹750	₹42	₹23
₹48	₹36	₹43	₹54	₹196	₹100	₹90	₹6	₹39	₹120	₹530	₹57	₹750	₹42	₹23
₹48	₹36	₹43	₹54	₹196	₹100	₹90	₹6	₹39	₹120	₹530	₹57	₹750	₹42	₹23
₹48	₹36	₹43	₹54	₹196	₹100	₹90	₹6	₹39	₹120	₹530	₹57	₹750	₹42	₹23
₹46	₹36	₹43	₹56	₹196	₹100	₹90	₹6	₹39	₹120	₹534	₹57	₹750	₹42	₹23
₹46	₹35	₹42	₹56	₹195	₹100	₹90	₹6	₹39	₹120	₹534	₹57	₹750	₹42	₹23
₹46	₹35	₹40	₹56	₹195	₹100	₹90	₹6	₹39	₹120	₹534	₹57	₹750	₹42	₹23
₹47	₹35	₹40	₹56	₹195	₹100	₹90	₹6	₹39	₹120	₹534	₹57	₹755	₹42	₹23
₹47	₹36	₹40	₹57	₹195	₹100	₹90	₹6	₹39	₹120	₹534	₹57	₹755	₹42	₹23
₹47	₹36	₹38	₹56	₹196	₹100	₹90	₹6	₹39	₹122	₹534	₹57	₹755	₹42	₹23
₹48	₹36	₹38	₹57	₹196	₹100	₹91	₹6	₹39	₹122	₹534	₹58	₹755	₹42	₹23
₹48	₹35	₹38	₹57	₹196	₹100	₹91	₹6	₹38	₹122	₹534	₹58	₹755	₹42	₹23
₹48	₹36	₹39	₹57	₹196	₹102	₹91	₹6	₹38	₹122	₹534	₹58	₹755	₹42	₹23
₹48	₹36	₹39	₹55	₹195	₹102	₹91	₹6	₹38	₹122	₹534	₹58	₹755	₹42	₹23
₹48	₹38	₹39	₹55	₹195	₹102	₹91	₹5	₹38	₹122	₹534	₹58	₹755	₹42	₹23
₹46	₹38	₹40	₹55	₹195	₹102	₹91	₹5	₹38	₹122	₹534	₹58	₹755	₹42	₹23
₹46	₹38	₹40	₹55	₹195	₹102	₹91	₹5	₹38	₹122	₹534	₹57	₹755	₹42	₹23
₹46	₹37	₹40	₹56	₹195	₹102	₹91	₹5	₹38	₹122	₹533	₹57	₹755	₹43	₹23
₹48	₹37	₹39	₹56	₹195	₹102	₹91	₹5	₹38	₹120	₹533	₹57	₹750	₹43	₹23
₹48	₹37	₹39	₹56	₹197	₹102	₹91	₹5	₹38	₹120	₹533	₹57	₹750	₹43	₹23
₹48	₹36	₹43	₹56	₹197	₹103	₹89	₹5	₹38	₹120	₹533	₹57	₹750	₹43	₹23
₹48	₹36	₹43	₹54	₹197	₹103	₹89	₹5	₹39	₹120	₹533	₹57	₹750	₹43	₹23
₹48	₹36	₹43	₹54	₹197	₹103	₹89	₹5	₹39	₹120	₹533	₹57	₹750	₹43	₹23
₹48	₹36	₹43	₹54	₹197	₹103	₹89	₹5	₹39	₹120	₹533	₹57	₹750	₹43	₹23

- Then, expenditure, total expenditure, average expenditure per item and total expenditure is calculated using formulas as:

$$Expenditure = Purchase\ Quantity * Purchase\ Price$$

$$Total\ Expenditure = \sum_{i=0} E_i$$

$$where\ E_i = Expenditure\ at\ i^{th}\ day$$

b) Increase the profit of the store:

- During store visit and my discussion with the store's owner, we found that due to the entrance of new competitors and online grocery shops, profits were declining, which was not a good sign for them to survive.
- That's why our first step was to figure out the profit / loss for each day, each item to determine the authenticity of the owner, for that I used sales and purchase data to calculate profit/loss, profit % for each item day using formula.

$$Profit = Sales - Purchase$$

$$profit_{item}\ \% = (profit_{item} / T.profit)\ \%$$

	P/L	REVENUE (SALES)	% OF TOTAL PROFIT	% OF TOTAL REVENUE
RICE	₹14,175	₹1,06,103	14%	13%
FLOUR	₹12,860	₹88,552	13%	11%
MAIDA	₹1,906	₹13,751	2%	2%
SUZI	₹1,717	₹15,949	2%	2%
TOOR DAL	₹4,676	₹51,691	5%	6%
NAMKEEN	₹7,308	₹59,166	7%	7%
BISCUIT	₹2,989	₹21,949	3%	3%
EGG	₹2,053	₹15,463	2%	2%
SUGAR	₹4,387	₹47,748	4%	6%
COOKING OIL	₹11,158	₹99,098	11%	12%
GHEE	₹14,238	₹84,424	14%	10%
MILK & DAIRY	₹5,341	₹88,194	5%	11%
DRY FRUITS	₹16,972	₹97,447	17%	12%
BREADS	₹700	₹10,528	1%	1%
SALT	₹757	₹6,783	1%	1%
Total	₹1,01,237	₹8,06,846		

DATE	Profit/Loss	Total Expenditure	Toal Sales
01-02-2024	-37208	63230	26022
02-02-2024	7392	20735	28127
03-02-2024	17520	18919	36439
04-02-2024	-493	22217	21724
05-02-2024	19348	4392	23740
06-02-2024	-8901	33321	24420
07-02-2024	2077	25813	27890
08-02-2024	2563	19770	22333
09-02-2024	952	27536	28488
10-02-2024	2481	30020	32501
11-02-2024	1281	23016	24297
12-02-2024	-17364	38168	20804
13-02-2024	14221	4146	18367
14-02-2024	19996	6366	26362
15-02-2024	14272	8568	22840
16-02-2024	-7473	28266	20793
17-02-2024	15992	9086	25078
18-02-2024	-24265	41946	17681
19-02-2024	22557	2572	25129
20-02-2024	4110	16556	20666
21-02-2024	-998	22931	21933
22-02-2024	4493	27581	32074
23-02-2024	7457	23504	30961
24-02-2024	11593	22327	33920
25-02-2024	10017	24648	34665
26-02-2024	-38586	63304	24718
27-02-2024	23194	2823	26017
28-02-2024	-11549	36394	24845
29-02-2024	19650	8168	27818
01-03-2024	21938	2624	24562
02-03-2024	28037	3595	31632

- Since there was some inventory for every item at the start and end of data collection purchase of each item, was calculated using formula.

$$Purchase = T.\ Purchase + I.\ Inventory - E.\ Inventory$$

Where I. Inventory = Initial inventory,

E. Inventory = End inventory,

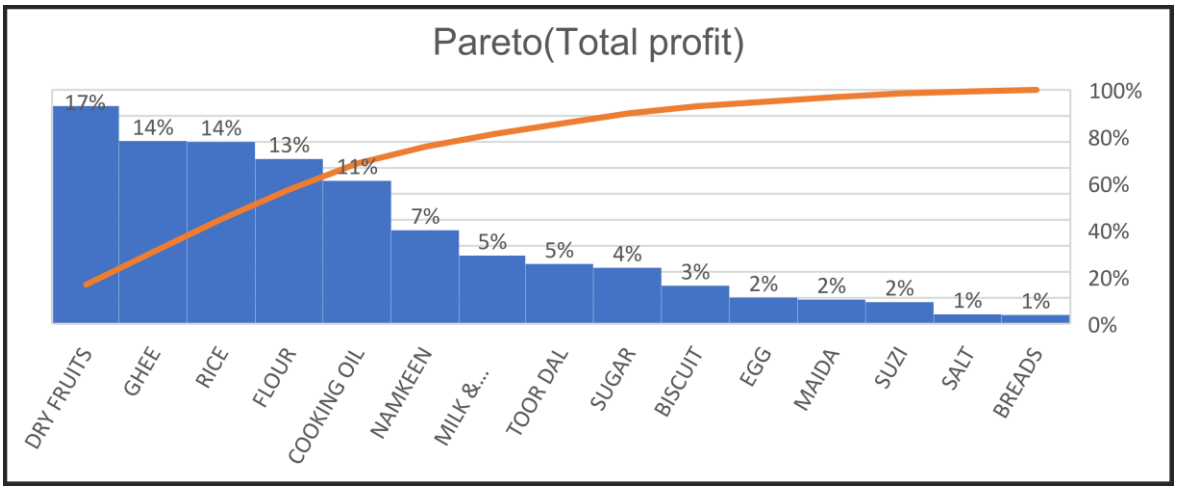
T. Purchase = Total purchase

AI37 =(AI34+AI35)-AI36

	EXPENDITURE															
	RICE	FLOUR	MAIDA	SUZI	TOOR DAL	NAMKEEN	BISCUIT	EGG	SUGAR	COOKING OI	GHEE	MILK & DAIR	DRY FRUITS	BREADS	SALT	Total
	₹9,200	₹3,700	₹800	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹2,565	₹7,550	₹258	₹575	₹24,648
	₹0	₹18,500	₹1,950	₹0	₹0	₹5,100	₹0	₹600	₹3,800	₹12,000	₹10,660	₹2,850	₹7,500	₹344	₹0	₹63,304
	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹2,565	₹0	₹258	₹0	₹2,823
	₹0	₹0	₹0	₹2,240	₹9,850	₹0	₹4,450	₹600	₹3,800	₹0	₹5,330	₹2,280	₹7,500	₹344	₹0	₹36,394
	₹4,800	₹0	₹0	₹0	₹0	₹0	₹0	₹600	₹0	₹0	₹0	₹2,280	₹0	₹258	₹230	₹8,168
	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹2,280	₹0	₹344	₹0	₹2,624
	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹600	₹0	₹0	₹0	₹2,565	₹0	₹430	₹0	₹3,595
Total	₹75,800	₹72,800	₹10,700	₹13,730	₹48,350	₹50,300	₹18,000	₹12,990	₹46,150	₹90,250	₹69,150	₹83,195	₹75,225	₹9,922	₹5,980	₹6,82,542
Initial Inventory	₹24,000	₹10,200	₹2,220	₹2,500	₹9,500	₹3,000	₹6,300	₹600	₹760	₹3,570	₹5,300	₹2,850	₹11,250	₹336	₹345	
Closing Inventory	₹7,872	₹7,308	₹1,075	₹1,998	₹10,835	₹1,442	₹5,340	₹180	₹3,549	₹5,880	₹4,264	₹3,192	₹6,000	₹430	₹299	
Expenditure	₹91,928	₹75,692	₹11,845	₹14,232	₹47,015	₹51,858	₹18,960	₹13,410	₹43,361	₹87,940	₹70,186	₹82,853	₹80,475	₹9,828	₹6,026	₹7,05,609

- In the end cumulative profit has been calculated to represent it in pareto chart

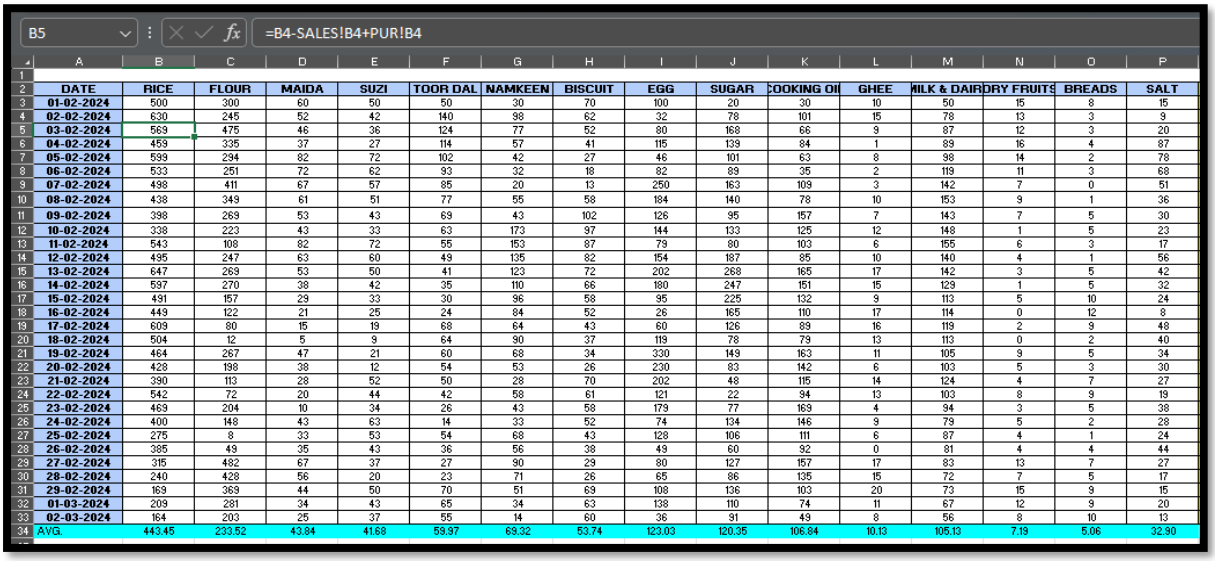
	% OF TOTAL PROFIT	Cumulative Profit %
RICE	14%	14%
FLOUR	13%	27%
MAIDA	2%	29%
SUZI	2%	30%
TOOR DAL	5%	35%
NAMKEEN	7%	42%
BISCUIT	3%	45%
EGG	2%	47%
SUGAR	4%	51%
COOKING OIL	11%	62%
GHEE	14%	77%
MILK & DAIRY	5%	82%
DRY FRUITS	17%	99%
BREADS	1%	99%
SALT	1%	100%



c) Inventory optimization methodology:

- During discussion with owner, we came to know that inventory management was the tedious task w.r.t stockpiled-up condition in the month end, less profit and new stock buying decision.
- Hence, we collect the inventory data for each item at very first day and afterward calculated using sales, purchase, and initial inventory as per below mentioned formula:

$$Inventory_i = Initial\ Inventory_i - Sales_i + Purchase_i$$



B5 =B4-SALES!B4+PUR!B4

DATE	RICE	FLOUR	MAIDA	SUZI	TOOR DAL	NAMKEEN	BISCUIT	EGG	SUGAR	COOKING OI	GHEE	MILK & DAIR	DRY FRUITS	BREADS	SALT
01-02-2024	500	300	60	50	50	30	70	100	20	30	10	50	15	8	15
02-02-2024	630	245	52	42	140	98	62	32	78	101	15	78	13	3	9
03-02-2024	569	475	46	36	124	77	52	80	168	66	9	87	12	3	20
04-02-2024	459	335	37	27	114	57	41	115	139	84	1	89	16	4	87
05-02-2024	599	294	82	72	102	42	27	46	101	63	8	98	14	2	78
06-02-2024	533	251	72	62	93	32	18	82	89	35	2	119	11	3	68
07-02-2024	498	411	67	57	85	20	13	250	163	109	3	142	7	0	51
08-02-2024	438	349	61	51	77	55	58	184	140	78	10	153	9	1	36
09-02-2024	398	269	53	43	69	43	102	126	95	157	7	143	7	5	30
10-02-2024	338	223	43	33	63	173	97	144	133	125	12	148	1	5	23
11-02-2024	543	108	82	72	55	153	87	79	80	103	6	155	6	3	17
12-02-2024	495	247	63	60	49	135	82	154	187	85	10	140	4	1	56
13-02-2024	647	269	53	50	41	123	72	202	268	165	17	142	3	5	42
14-02-2024	597	270	38	42	35	110	66	180	247	151	15	129	1	5	32
15-02-2024	491	157	29	33	30	96	58	95	225	132	9	113	5	10	24
16-02-2024	449	122	21	25	24	84	52	26	165	110	17	114	0	12	8
17-02-2024	609	80	15	19	68	64	43	60	126	89	16	119	2	9	48
18-02-2024	504	12	5	9	64	90	37	119	78	79	13	113	0	2	40
19-02-2024	464	267	47	21	60	68	34	330	149	163	11	105	9	5	34
20-02-2024	428	198	38	12	54	53	26	230	83	142	6	103	5	3	30
21-02-2024	390	113	28	52	50	28	70	202	48	115	14	124	4	7	27
22-02-2024	542	72	20	44	42	58	61	121	22	94	13	103	8	9	19
23-02-2024	469	204	10	34	26	43	58	179	77	169	4	94	3	5	38
24-02-2024	400	148	43	63	14	33	52	74	134	146	9	79	5	2	28
25-02-2024	275	8	33	53	54	68	43	128	106	111	6	87	4	1	24
26-02-2024	385	49	35	43	36	56	38	49	60	92	0	81	4	4	44
27-02-2024	315	482	67	37	27	90	29	80	127	157	17	83	13	7	27
28-02-2024	240	428	56	20	23	71	26	65	86	135	15	72	7	5	17
29-02-2024	169	369	44	50	70	51	69	108	136	103	20	73	15	9	15
01-03-2024	209	281	34	43	65	34	63	138	110	74	11	67	12	9	20
02-03-2024	164	203	25	37	55	14	60	36	91	49	8	56	8	10	13
AVG.	443.45	233.52	43.84	41.68	59.97	69.32	53.74	123.03	120.35	106.84	10.13	105.13	7.19	5.06	32.90

- By using above inventory data, average inventory, total inventory was calculated for each day for each item.

$$Total\ Inventory = \sum_{i=0} I_i$$

$$where\ I_i = Inventory\ at\ i^{th}\ day$$

DATE	Daily Inventory	AVG. DAILY
01-02-2024	1308	87
02-02-2024	1598	107
03-02-2024	1824	122
04-02-2024	1605	107
05-02-2024	1628	109
06-02-2024	1470	98
07-02-2024	1876	125
08-02-2024	1700	113
09-02-2024	1547	103
10-02-2024	1561	104
11-02-2024	1549	103
12-02-2024	1768	118
13-02-2024	2099	140
14-02-2024	1918	128
15-02-2024	1507	100

d) Fixed cost analysis:

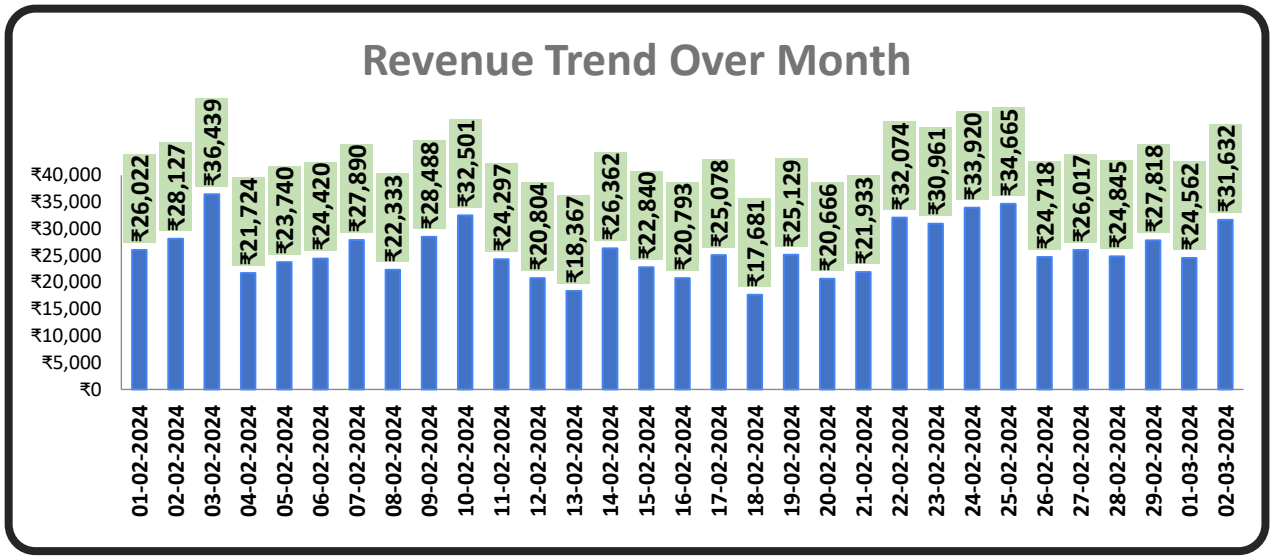
- In this analysis, we collected the data for furniture, transport, storage items, rent for a period of approx. 31 days considering the depreciation rate.
- Considering the collected data, total fixed cost was calculated.

FIXED COST ANALYSIS			
	COST	RATE OF DEPRICIATION	DEPRICIATION
FURNITURE	800000	1%	₹8,000
FREEZER	120000	2%	₹2,400
CONTAINERS	80000	1%	₹800
DELIVERY VEHICLES	80000	5%	₹4,000
PETROL/TRANSPORT	5000	100%	₹5,000
RENT	35000	100%	₹35,000
ELECTRICITY	15000	100%	₹15,000
CARRY BAGS	3000	100%	₹3,000
TOTAL FIXED COST	₹11,38,000	TOTAL NORMALISED FIXED COST	₹73,200

3 Results and findings:

a) Sales and purchase analysis:

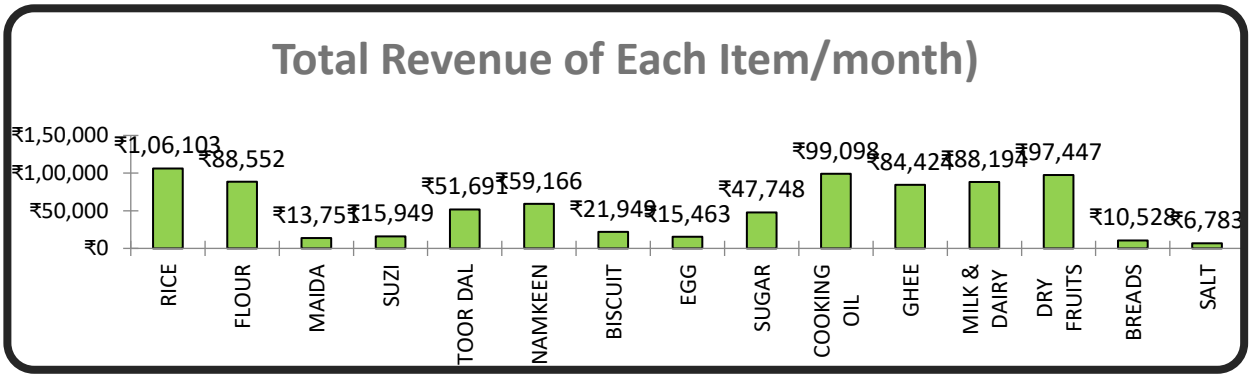
- Firstly, graph for revenue generated over the month, is made.

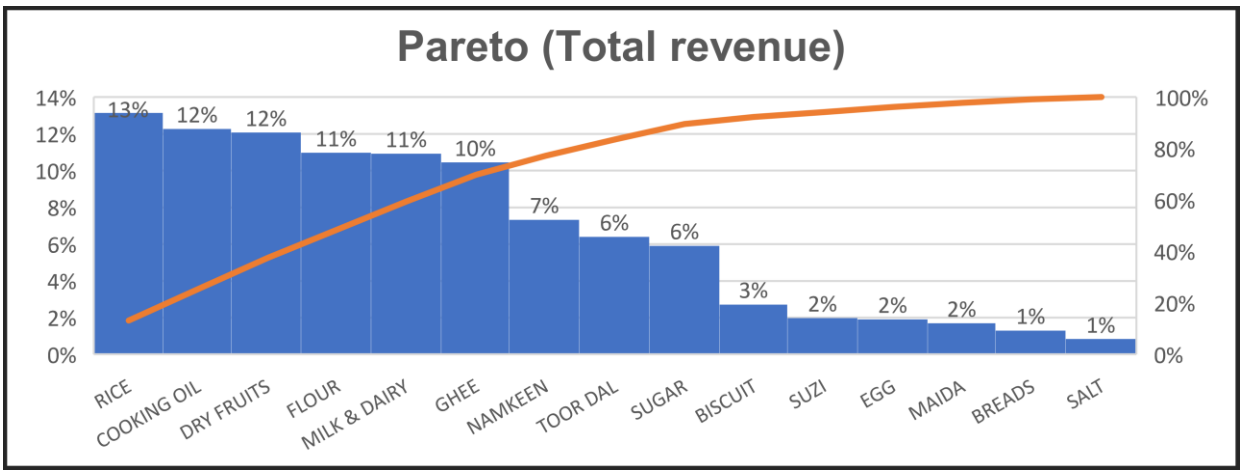


- By seeing above graph, we can say that sales are good on Saturdays as compared to other days.
- In the mid of the month, slight decline trend is visible in sales.
- If we talk about the average daily revenue generated is ₹ 26027 and Standard deviation is ₹ 4780 which not so high and we can say low level of fluctuation is visible in sales.

- Minimum revenue ₹ 17681.
- Maximum revenue ₹ 36439.
- The range of max and min is ₹ 18758.

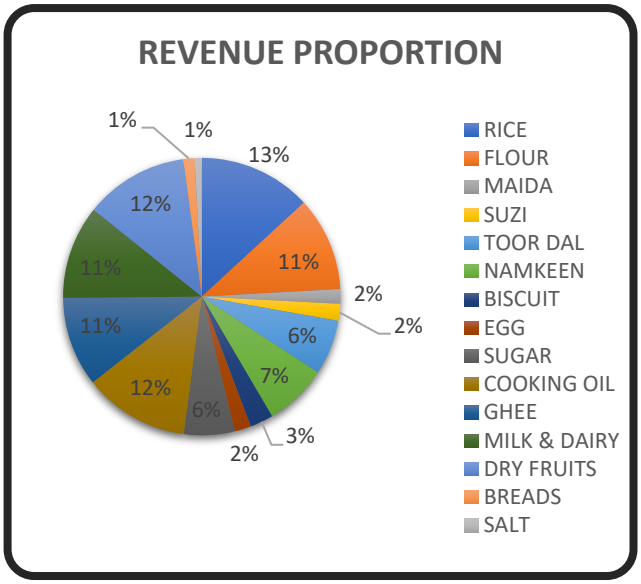
Further, revenue generated by each item over the month and pareto chart in respect to the total revenue generated by each item over the month, has been represented.

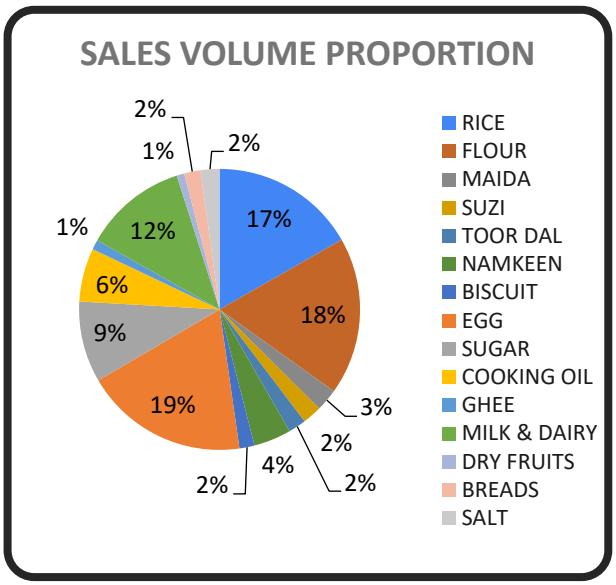




- By looking above graphs, we can say that Rice, Cooking Oil, Dry Fruits, Flour, Milk & Dairy and Ghee are the main revenue generating items over the month.
- The fact also can be seen by pareto chart as these 6 items contribute approx. 69% to the total store's revenue.

Further, to analyse each item contribution, revenue proportion pie graph has been made along with sales volume proportion pie chart.

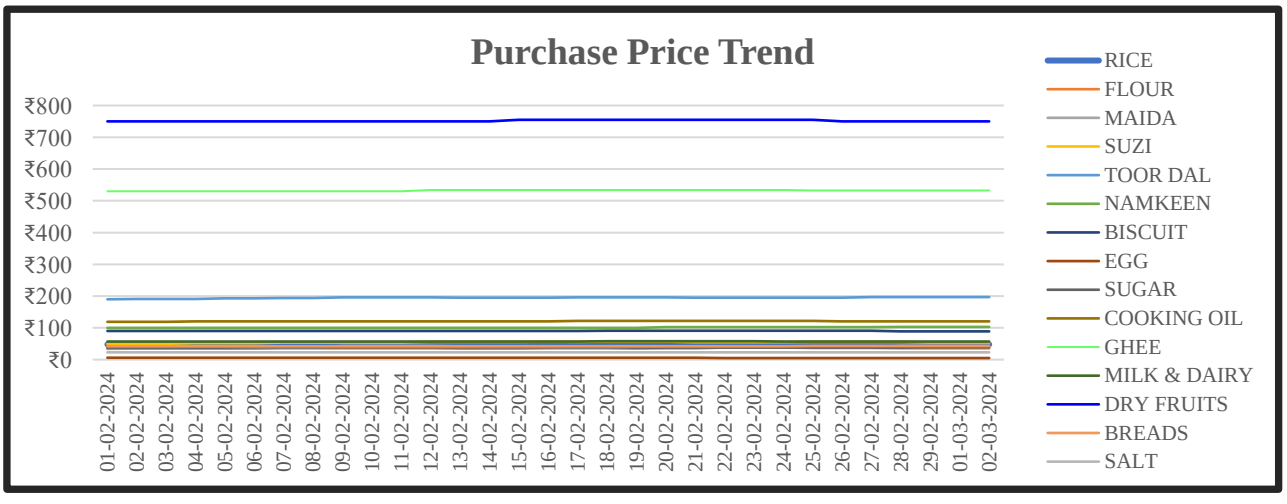




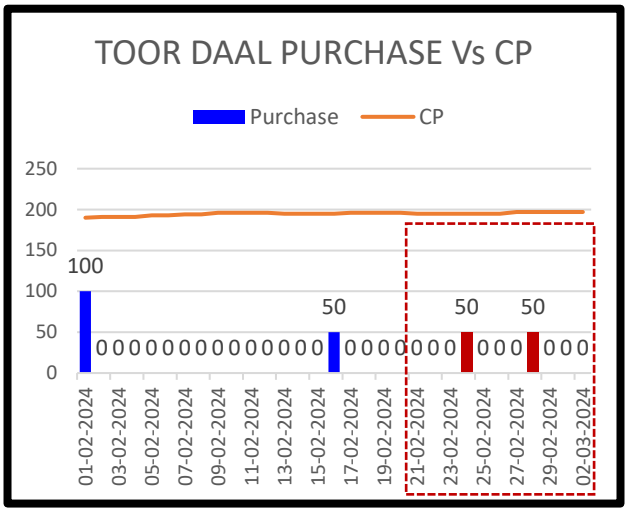
- By seeing above graphs, we can say that revenue proportion of each item is directly proportionate to the sales volume.
- Cooking oil, Ghee and Dry Fruits having sales volume of 6%, 1% and 1% respectively contributes 12%, 11% and 12% to the total revenue generated by the store over the month means these are high revenue generating items at a low level of sales volumes.

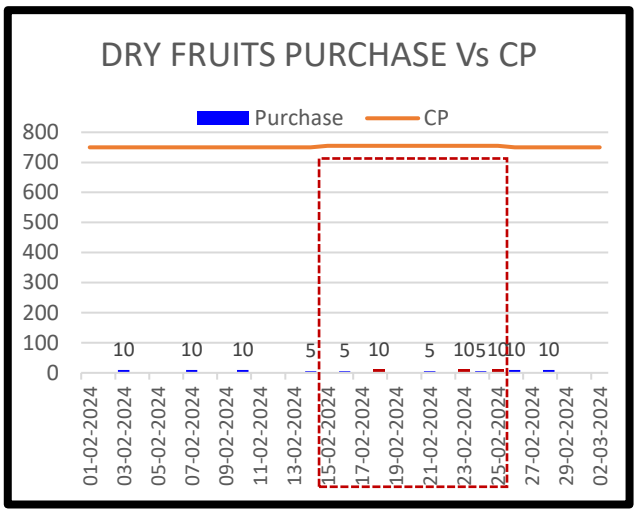
After sales analysis, we have analysed the fluctuation trend in purchase price as shown in below graph.

- By seeing below graph, we can say that purchase price slightly up in mid of the month which coincide with the highest revenue generating period as mid of the month.
- Dry fruits purchase price shows dip in the trend at the end of the month, means it is a best time to purchase the dry fruits to generate the maximum profit.
- On the other hand, TOOR DAAL purchase price shows slight up trend after mid of the month which shows that early stock of it will generate the greater profit.



Based on above analysis, we have plotted graphs for “Toor Daal” and “Dry Fruits” purchase price and purchase volume to analyse the buying decision made by store owner.

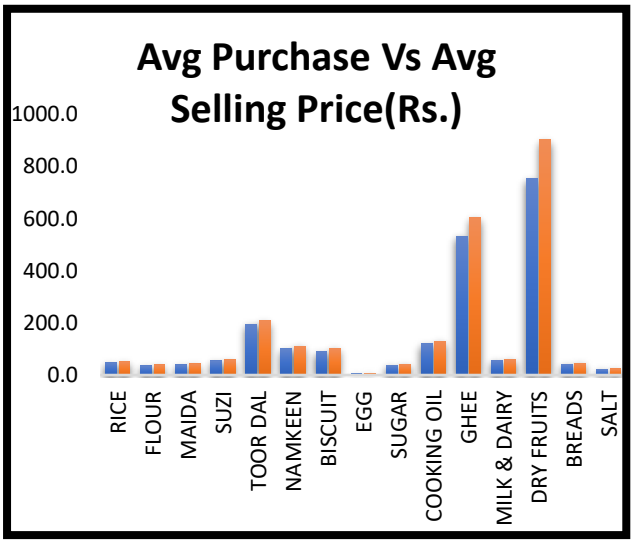


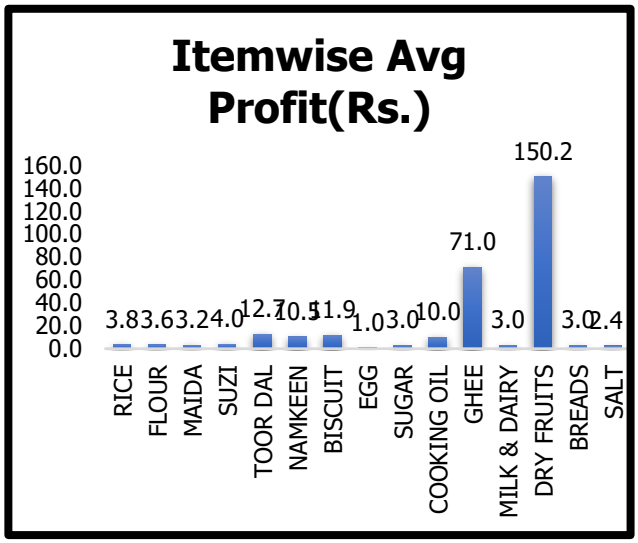


- By seeing above graphs, we can say that owner could increase the profit by early purchasing of “Toor Daal” and slightly delay or early purchasing of “Dry Fruits”.

b) Profit / Loss analysis:

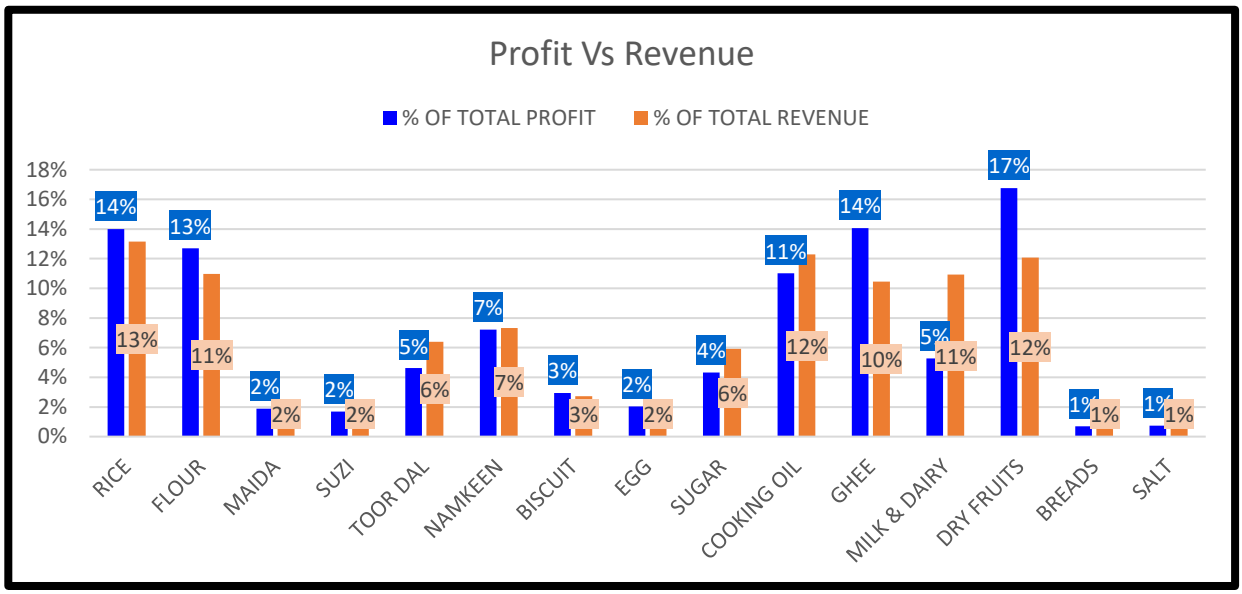
The graphs plotted over here shows the comparison of average purchase price to the average selling price for each item which further used to calculate the average profit of each item to analyse the gap areas which can be further improved to increase the net profit.





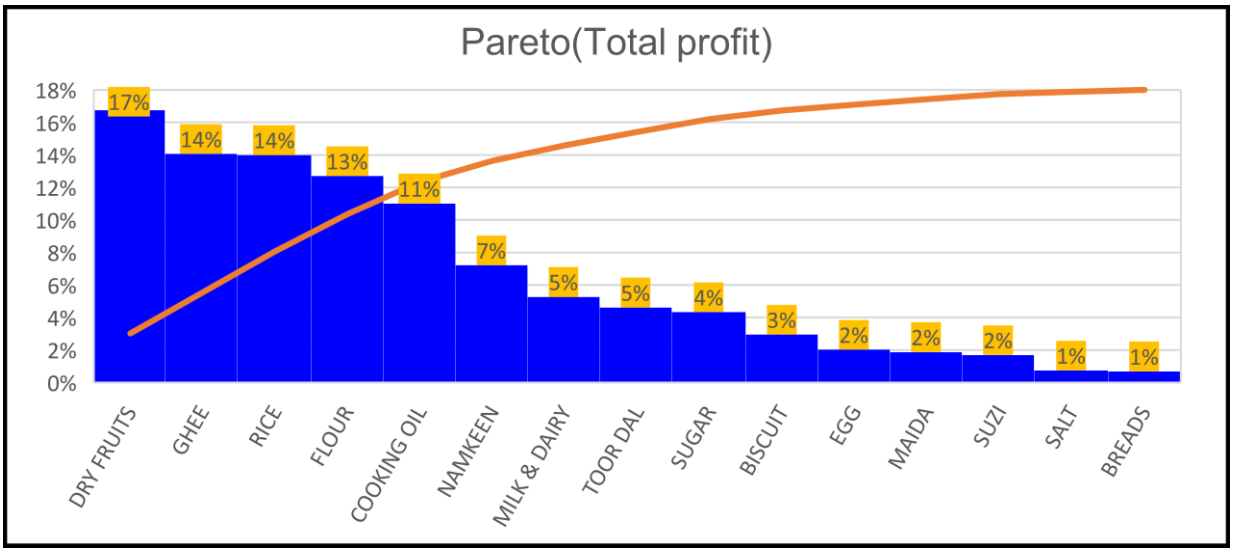
- From the above graphs, we can see that “Dry Fruits” and “Ghee” are the maximum profit generating items. On the other hand, if we look at sells volume of both the items, needs to be improved to increase the net profit of the store.

Further, we have plotted the graph to show the contribution of each item to the profit in comparison to the contribution in the revenue.



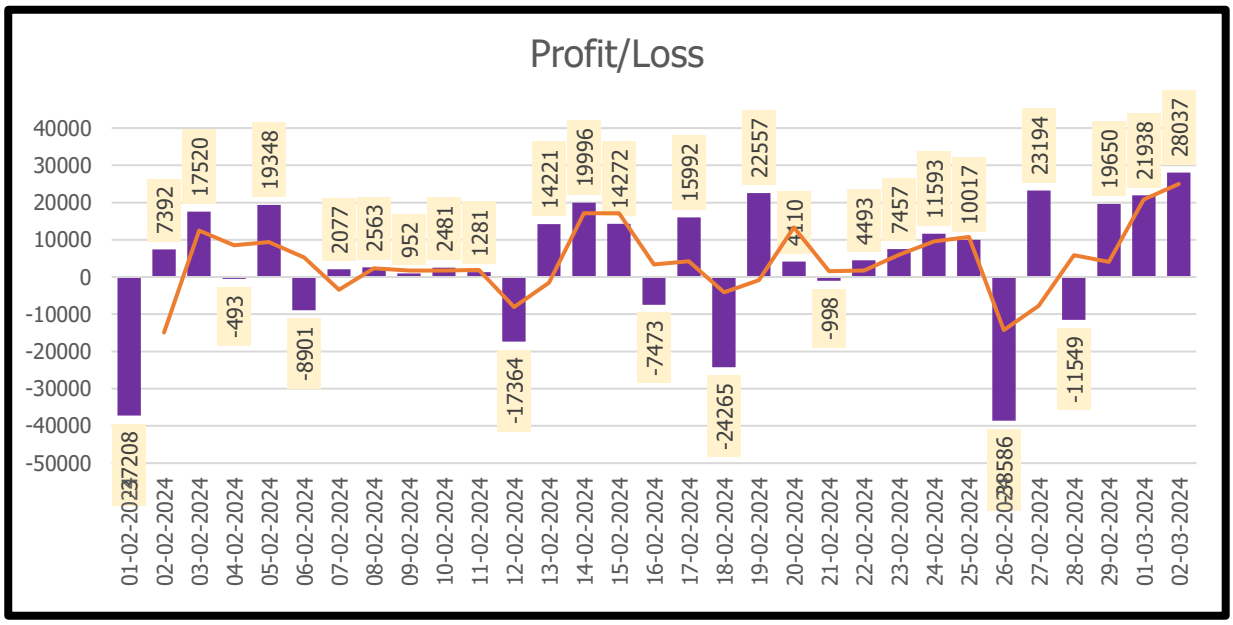
- The comparison graph validates our previous claim about “Dry Fruits” and “Ghee”.
- The above graph also indicates that “Milk & Dairy” and “Sugar” even after having enough sells volume, contribution to the net profit is lower as compared to other items.

To validate our above findings, pareto chart is plotted here.



- By seeing above pareto graph, we can easily say that 76% contribution to the profit is from Dry fruits, Ghee, Rice, Flour, Cooking oil and Namkeen.
- We can also validate our claim regarding “Milk & Dairy” and “Sugar” as they are not in 76%

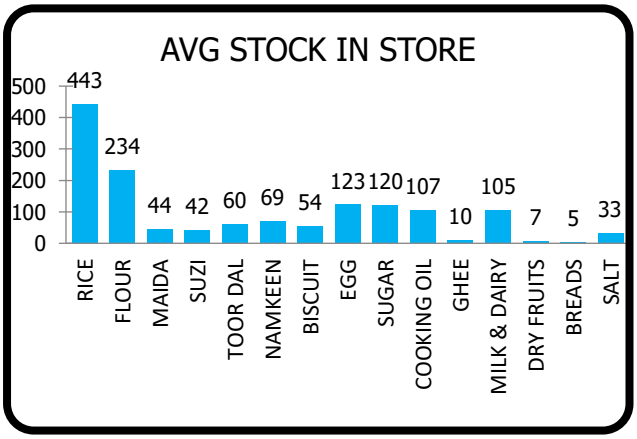
Furthermore, graph is generated to analyse the gross profit and loss over the period of the month.

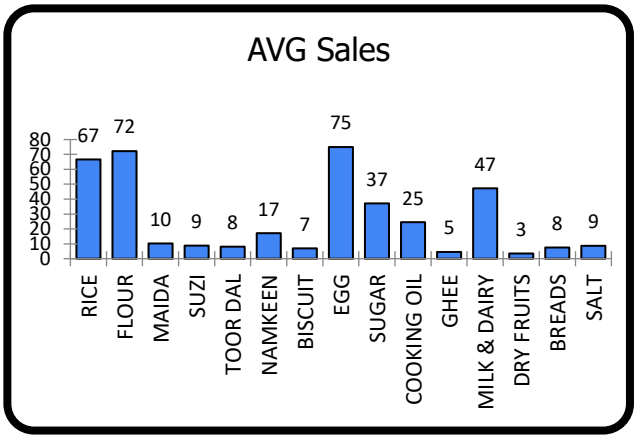


- We can say that purchasing "Dry fruits" and "Toor Daal" at right time, will increase the net profit of the store.
- It is also can be validated that after mid of the month, profit increases.
- We also can say that the stock addition in the start of the month, resulting in the lower net profit of the store.

c) Inventory analysis:

To do the analysis of inventory, we plotted the graphs showing average sales and stock of each item available in the store.

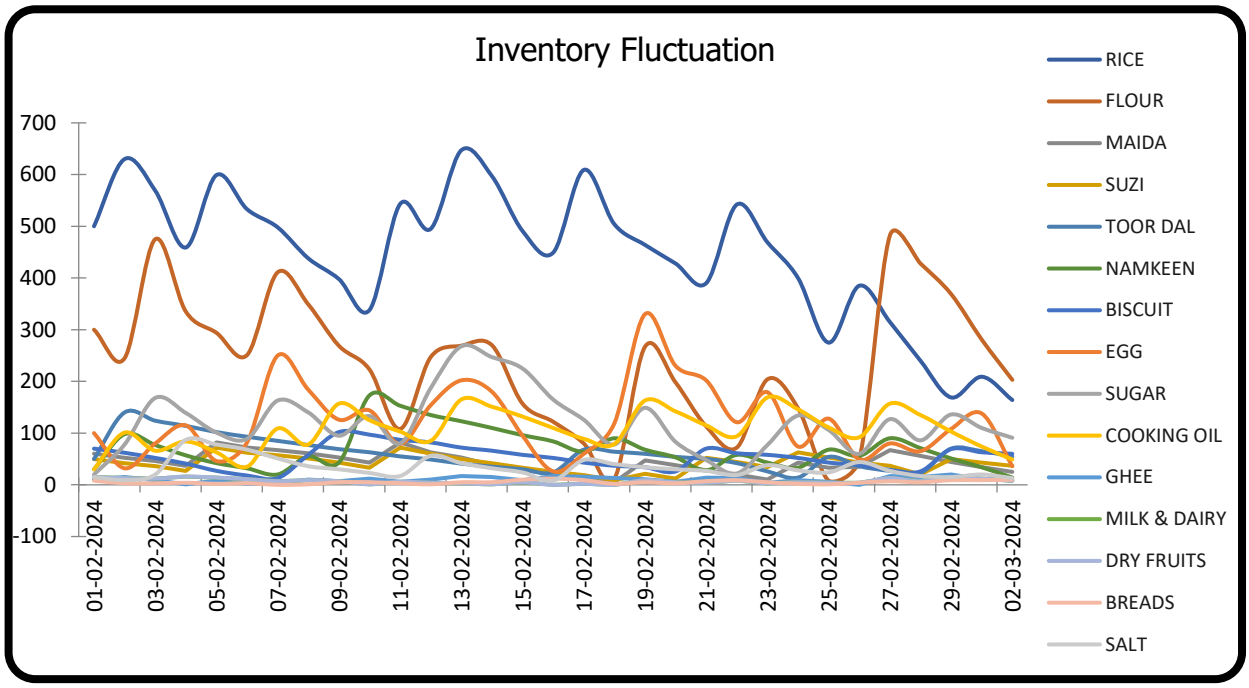




- By looking at both the graphs, we can say that there is no abnormality except "Breads".

- Rice, Flour and other items inventory is high, need to optimize the same to increase the net profit margin.

Now moving on to cater the inventory related issues, we plotted the inventory fluctuation graph over the period of month.



- By looking at above graph, we can say that there is no abnormality in average stock w.r.t sales, however, fluctuations are high in inventory for most of the items and slight dip in trend is visible after mid of the month which indicates poor planning and validate the owner's claim of tedious task to maintain the inventory.
- Secondly, it can also be seen easily that store tends to refill its stock in relation to demand or stock is limited which can be referred to as a good practice, but it is having bad impact.

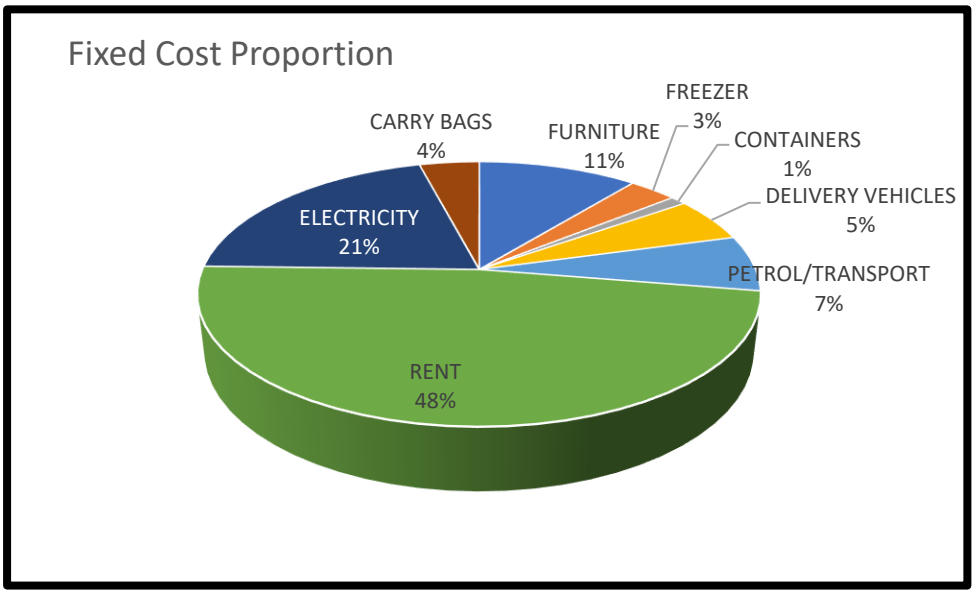
d) PL & Insights:

Now to calculate the net profit, fixed cost is calculated using the data given by store owner.

FIXED COST ANALYSIS			
	COST	RATE OF DEPRICIATION	DEPRICIATION
FURNITURE	800000	1%	₹8,000
FREEZER	120000	2%	₹2,400
CONTAINERS	80000	1%	₹800
DELIVERY VEHICLES	80000	5%	₹4,000
PETROL/TRANSPORT	5000	100%	₹5,000
RENT	35000	100%	₹35,000
ELECTRICITY	15000	100%	₹15,000
CARRY BAGS	3000	100%	₹3,000
TOTAL FIXED COST	₹11,38,000	TOTAL NORMALISED FIXED COST	₹73,200

- The above table provides us with fixed cost analysis along with depreciation rate (approx. given by the owner)
- Items in above table can be majorly divided into two segments: - fixed assets and monthly expenses.
- From the above table following things can also be calculated:
    - Total fixed cost: ₹ 11,38,000
    - Total Normalized Fixed cost: ₹ 73,200, which can be used to calculate net profit using formula:
      $(Net\ profit = Gross\ Profit - Total\ Normalised\ Fixed\ Cost)$
    - Net profit: ₹ 28,037

Further we have plotted pie chart to analyse fixed cost proportion.



- By seeing above graph, we can say that rent and electricity are the main contributors to the fixed cost but considering necessity for the shop, further reduction cannot be done.

4 Interpretation of results and recommendation:

a) Recommendation 1: Increase the sales of High profit items: (i.e., Dry Fruits, Ghee & Rice)

Based on the analysis, it is evident that Dry Fruits, Ghee and Rice have significantly higher profit margins compared to other items. The shop owner can take advantage of this by increasing the sales of these items, resulting in higher profits and additional assets for the shop.

Measures can be taken to increase the sales of high profit margin items:

- **Seasonal Promotion**: Dry Fruits are commonly consumed during winter and festive season. The shop can launch a sale on dry fruits during this season to capitalize on increased demand and boost sales.
- **B2B Platforms and Business Partnerships:** Dry Fruits, Ghee and Rice are essential items for other businesses as well. The shop can promote this by participating in B2B platforms or approaching other businesses to sell these items at a lower rate than what is offered to customers. However, this may reduce the profit margin per unit, it can significantly increase overall sales and ultimately lead to higher net profits for the shop.
- **Bulk Sales and Discounts:** Instead of selling small quantities of dry fruits and rice, the shop owner can offer larger quantities of dry fruits and rice packets at discounted prices to attract customers and other business owners. This strategy can encourage customers to buy in bulk and increase sales volume.

b) Recommendation 2: Increase the sales of items having low revenue : (i.e., Breads)

In line with the first recommendation, it is important to address items like Cooking Oil, Milk & Dairy that may not be meeting sales expectations due to seasonal, time-specific, or incentive-based factors. To optimize inventory further and increase sales, the following strategies can be implemented:

- **Morning-focused Milk Sales**: Based on discussions with the owner, it was found that 95% of milk sales occur in the morning. To enhance inventory management and increase sales, the shop can prioritize stocking milk specifically for morning demand. Additionally, the shop can encourage customers to purchase other goods along with milk or offer house delivery of milk at no additional cost. This strategy can optimize fixed assets, such as delivery vehicles, and increase overall sales. Successful startups like OTIPY, Milk BASKET have employed similar strategies to boost their sales.

- **Introduce Delivery Charges:** Once the initial phase of offering free home delivery of milk is established, the shop owner can gradually introduce nominal charges for delivery. This will not only help cover the cost of the service but also generate additional profits for the shop.

c) Recommendation 3: Restock inventory according to sales:

The shop owner made poor decisions in purchasing Toor Daal and Dry fruits, resulting in significant losses for the shop. These decisions were primarily influenced by high demand and low stock availability at that time. To avoid such situations and optimize inventory management, the following recommendations can be implemented.

- **Timely restocking:** Rather than purchasing and selling items based on demand, it is advisable to restock the inventory at fixed intervals. The items can be sorted based on perishable and non-perishable goods based on self-life, considering the shop's facilities and the owner's preferences. This approach allows the shop owner to identify items that can be purchased in advance, reducing the risk of making last-minute decisions.

- **Timing Restock with High Sales Periods**: By analyzing the data, it is observed that purchasing of goods considering purchase price, sometime pre-purchasing and post purchasing is beneficial to the store. Therefore, it is recommended to restock inventory slightly earlier or later to avoid making incorrect decisions due to inadequate stock. By aligning restocking with high sales periods, the shop can ensure sufficient inventory availability without excessive load or unnecessary risks.

d) Recommendation 4: Increase current ratio:

The analysis reveals that the shop's current ratio (CR) is currently low, indicating potential liquidity issues. The current ratio can be improved by either increasing current assets or decreasing liabilities. (based on formula given below)

$$Current\ Assets = Inventory\ (stock) + Cash\ (₹\ 25000) = ₹\ 38{,}818$$

$$Current\ Ratio = Current\ Assets\ /\ Liabilities = 0.04$$

Considering the constraints of the scenario where household expenses rely on the majority of profits and essential liabilities for running the business, reducing liabilities is not a feasible option. Therefore, the focus should be on increasing sales to boost current assets and improve the current ratio.

By implementing the aforementioned recommendations to increase the sales of high-profit items, restocking inventory at optimal times, and targeting specific sales strategies for milk and other items, the shop owner can enhance profitability, optimize inventory management, and improve the current ratio, leading to a more financially stable and successful business.

e) Recommendation 5: Additional ways:

e.1): Effective Pricing:

Another aspect to consider in increasing profitability is implementing effective pricing strategies. The shop owner can explore the following approaches:

- **Combo Offer**: Considering combo offers where related items such as rice and atta are sold together at a discounted price. This will encourage the customers to buy multiple items and increase the store's overall net profit.

- **Promotional pricing**: Time to time special offer and promotions, such as discounts, buy one get one free, 5% less from MRP to attract the customers. These promotional pricing strategies can boost sales during specific periods or intervals.

e.2): Store's display and visual enhancement:

Below given steps can be taken to enhance the store's visuals and display:

- **Eye-catching displays:** Arrange high-profit items, such as dry fruits and ghee, in attractive displays near the entrance or high-man movement areas. Use creative and appealing signage or decorations to draw attention and entice the customers to explore those sections.

- **Technology inculcation**: Technology plays a vital role in every field. Hoardings, banners and screens having clear message about special offers, can draw attention and entice the customers to explore these offers.

5 Conclusion:

In summary, the analysis of Shiv Shakti Mill Kirana Store's sales and expenditure data has yielded actionable insights aimed at enhancing profitability and optimizing inventory management.

Through this comprehensive examination, it became evident that certain product categories, notably Dry Fruits and Ghee, possess substantial profit potential. Leveraging targeted marketing initiatives, such as seasonal promotions and strategic partnerships, presents a promising avenue for capitalizing on these high-margin items. Additionally, incentivizing bulk purchases through discounts can further stimulate sales and bolster overall revenue.

Moreover, the assessment underscored the critical importance of refining inventory management practices. Proactive restocking during peak demand periods, coupled with refined forecasting techniques, will enable the store to maintain optimal stock levels, thereby mitigating both excess inventory costs and potential stockouts. This proactive stance ensures customer satisfaction while simultaneously optimizing operational efficiency.

Furthermore, prudent procurement practices emerged as a focal point, emphasizing the need for vigilant monitoring of market dynamics to circumvent purchasing at inflated prices, as evidenced by the fluctuations in Dry Fruits and Toor Daal costs. By adopting a proactive procurement strategy, the store can mitigate financial risks and safeguard profitability.

The scrutiny of fixed costs highlighted opportunities for cost optimization, particularly in areas such as electricity and packaging materials. Continuous evaluation and refinement of expenditure are imperative to enhance cost efficiency and safeguard profit margins.

Additionally, recommendations to enhance store aesthetics and implement effective pricing strategies are poised to elevate customer engagement and drive sales. Engaging displays, coupled with strategic pricing tactics, create a compelling shopping environment, fostering increased consumer spending and bolstering revenue streams.

By embracing these strategic imperatives, Shiv Shakti Mill Kirana Store stands to enhance its financial performance, fortify profitability, and solidify its competitive foothold within the market. It is imperative for the proprietor to maintain a vigilant stance, continuously evaluating the efficacy of these measures and adapting as necessary to ensure sustained growth and resilience in an ever-evolving market landscape.

6 Important link:

Spreadsheet: 21f3001362_BDM_Capstone_Spreadsheet

Presentation: BDM_Project_PPT_Digpal

Submitted by-
Digpal Singh
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