Enhancing Sales Strategy at Subhash General Stores in Changing Market Dynamics.

Mid-Term Submission for the BDM Capstone Project

Submitted by

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Contents

1. Executive Summary

Subhash General Stores, Chirala, is a well-established fertilizer shop, that sells fertilizers and pesticides for farmers and gardeners for over four decades. Located at 21-1-185, Near By Perala Market, Andhra Ratna Road-523155, Chirala, Andhra Pradesh, the shop has earned a reputation for quality products and exceptional customer service.

The major problem facing Sri Subrahmanyeswara Fertilisers is a significant decline in sales and customer footfall over the past two years, and also the irregularity in the inventory.

To address the decline in sales and enhance profitability, the project will adopt a data-driven approach. Descriptive Analysis for clear understanding of current trends and patterns in sales, and inventory management. Given the seasonal nature of the business, will also employ time series analysis.

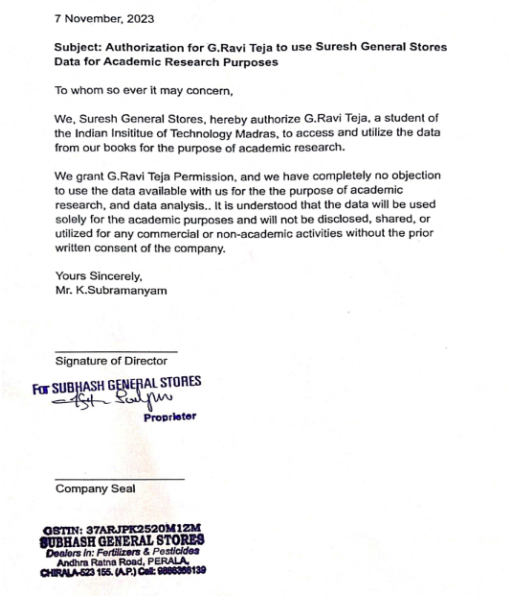
The expected outcome of this project is to identify the customer buying behaviour, analyze market trends as per seasons, and devise an effective sales strategy for better inventory management that can increase sales and ultimately lead to improved profitability.

2. Proof Of Originality

Below are the supporting links, images, and documents affirming the originality and authenticity of the data and the project.

1. **Shop Location:**
   Door No 21-1-185, Andhra Ratna Road, Chirala HO, Chirala - 523155 (Near Perala Vegetable Market).
   Ref: [Justdial - Subash General Stores]

2. **Authorization Letter by Shop Owner Mr. K.Subramanyam:**



7 November, 2023

Subject: Authorization for G.Ravi Teja to use Suresh General Stores Data for Academic Research Purposes

To whom so ever it may concern,

We, Suresh General Stores, hereby authorize G.Ravi Teja, a student of the Indian Insititue of Technology Madras, to access and utilize the data from our books for the purpose of academic research.

We grant G.Ravi Teja Permission, and we have completely no objection to use the data available with us for the the purpose of academic research, and data analysis.. It is understood that the data will be used solely for the academic purposes and will not be disclosed, shared, or utilized for any commercial or non-academic activities without the prior written consent of the company.

Yours Sincerely,
Mr. K.Subramanyam

Signature of Director

For SUBHASH GENERAL STORES
Proprietor

Company Seal

GSTIN: 37ARJPK2520M1ZM
SUBHASH GENERAL STORES
Dealers in: Fertilizers & Pesticides
Andhra Ratna Road, PERALA,
CHIRALA-523 155. (A.P.) Cell: 9866368139

Authorization Letter by Subhash General Stores.pdf

3. **Proof of Originality Video:**
   Proof or Originality Video
   This video consists of
   A. shop images
   B. Sample Video of Bill book
   C. Sample Video of Stock book
   D. Explaining the First Level Analysis to the Owner
   E. Discussion on the Analysis
   F. Signature, Stamp on the Authorization Letter.

4. **Images of the Stock Book and Bill Book:** The shop owner has generously granted me access to the necessary books in the shop, below are the pictures.

Unstructured Bill Book Data Contains

1. Customer name
2. Customer Village
3. Date of Purchase
4. Items Bough
5. Rate of Each Item
6. Weight of the Item
7. Quantity of Item
8. Total Cost of the Item
9. Total Cost of the Purchase.

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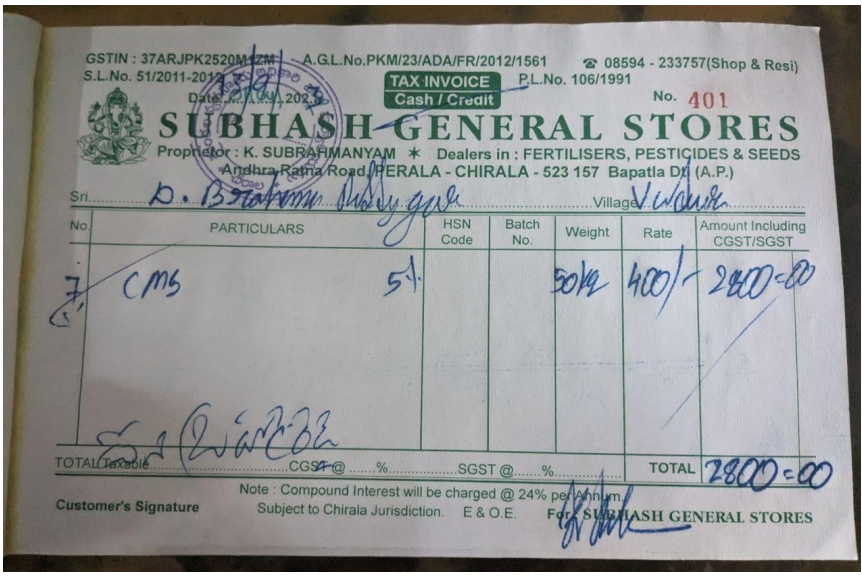


GSTIN : 37ARJPK2520M1ZM A.G.L.No.PKM/23/ADA/FR/2012/1561 ☎ 08594 - 233757(Shop & Resi)
S.L.No. 51/2011-2012 P.L.No. 106/1991
TAX INVOICE Cash / Credit No. 401

SUBHASH GENERAL STORES

Proprietor : K. SUBRAHMANYAM ✶ Dealers in : FERTILISERS, PESTICIDES & SEEDS
Andhra Ratna Road, PERALA - CHIRALA - 523 157 Bapatla Dt. (A.P.)

Sri. D. B. Rahaman Village Vadarevu

No.	PARTICULARS	HSN Code	Batch No.	Weight	Rate	Amount Including CGST/SGST
7	CMS		51	50kg	400/-	2800-00

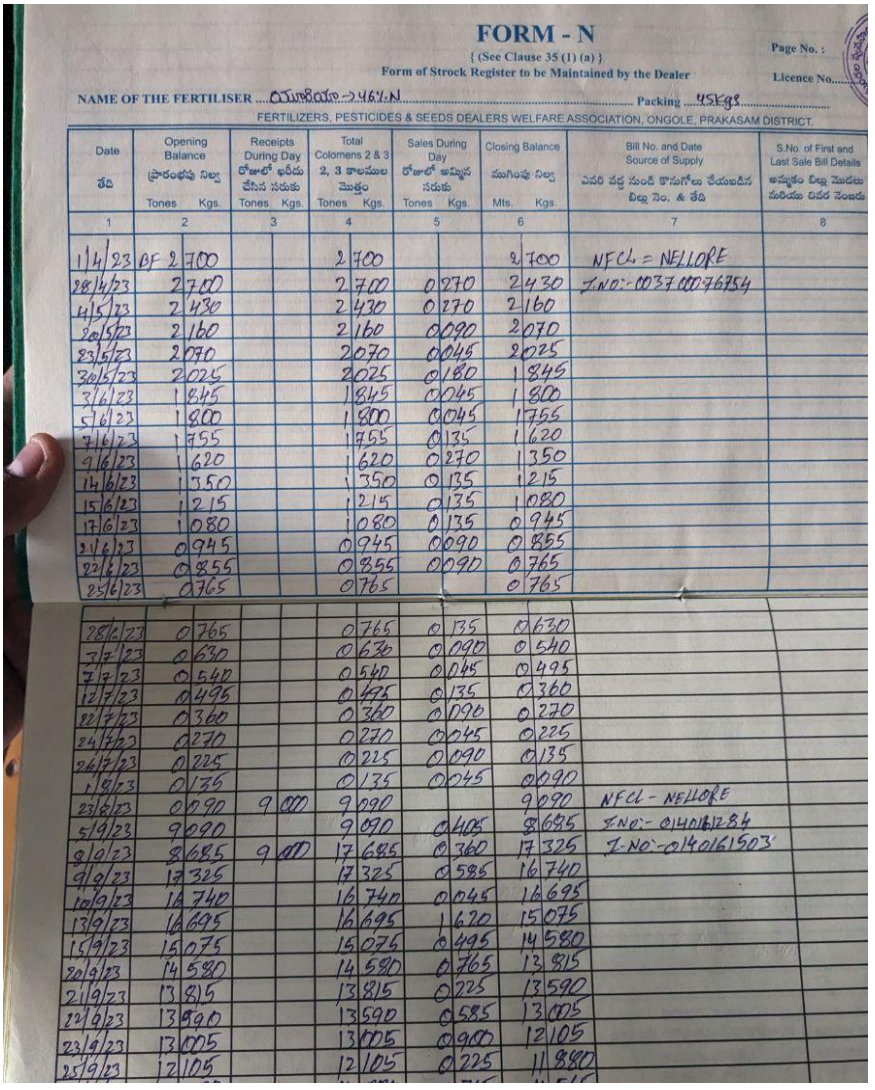
TOTAL Taxable CGST @ % SGST @ % TOTAL 2800-00

Note : Compound Interest will be charged @ 24% per Annum.
Customer's Signature Subject to Chirala Jurisdiction. E & O.E. For SUBHASH GENERAL STORES

Fig 3 - This is a photo of one such bill
Contains the bills information from October 13th

Structured Stock Book Data

1. Stock Information Date
2. Opening Balance
3. Stock Received Today
4. Total Opening Balance
5. Sales Today
6. Closing Balance
7. Supplier (If Stock Received)



FORM - N
{ (See Clause 35 (1) (a) }
Form of Strock Register to be Maintained by the Dealer
Page No. :
Licence No.....
NAME OF THE FERTILISER ..... Packing .....
FERTILIZERS, PESTICIDES & SEEDS DEALERS WELFARE ASSOCIATION, ONGOLE, PRAKASAM DISTRICT.

Date తేది	Opening Balance ప్రారంభపు నిల్వ Tones	Kgs.	Receipts During Day రోజులో భీడిమ చేసిన సరుకు Tones	Kgs.	Total Colomens 2 & 3 2, 3 కాలముల మొత్తం Tones	Kgs.	Sales During Day రోజులో అమ్మిన సరుకు Tones	Kgs.	Closing Balance ముగింపు నిల్వ Mts.	Kgs.	Bill No. and Date Source of Supply ఎవరి వద్ద నుండి కొనుగోలు చేయబడిన బిల్లు నెం. & తేది	S.No. of First and Last Sale Bill Details అమ్మకం బిల్లు మొదటి మరియు చివర నెంబరు
1	2		3		4		5		6		7	8
1/4/23	OF 2	700			2	700			2	700	NFCL = NELLORE	
28/4/23	2	700			2	700	0	270	2	430	I.NO:-0037000767854	
4/5/23	2	430			2	430	0	270	2	160		
20/5/23	2	160			2	160	0	090	2	070		
23/5/23	2	070			2	070	0	045	2	025		
30/5/23	2	025			2	025	0	180	1	845		
3/6/23	1	845			1	845	0	045	1	800		
5/6/23	1	800			1	800	0	045	1	755		
7/6/23	1	755			1	755	0	135	1	620		
9/6/23	1	620			1	620	0	270	1	350		
14/6/23	1	350			1	350	0	135	1	215		
15/6/23	1	215			1	215	0	135	1	080		
17/6/23	1	080			1	080	0	135	0	945		
21/6/23	0	945			0	945	0	090	0	855		
22/6/23	0	855			0	855	0	090	0	765		
25/6/23	0	765			0	765			0	765		
28/6/23	0	765			0	765	0	135	0	630		
3/7/23	0	630			0	630	0	090	0	540		
7/7/23	0	540			0	540	0	045	0	495		
12/7/23	0	495			0	495	0	135	0	360		
22/7/23	0	360			0	360	0	090	0	270		
24/7/23	0	270			0	270	0	045	0	225		
26/7/23	0	225			0	225	0	090	0	135		
1/8/23	0	135			0	135	0	045	0	090		
23/8/23	0	090	9	000	9	090			9	090	NFCL - NELLORE	
5/9/23	9	090			9	090	0	405	8	685	I.NO:-0140161284	
8/9/23	8	685	9	000	17	685	0	360	17	325	I.NO:-0140161503	
9/9/23	17	325			17	325	0	585	16	740		
10/9/23	16	740			16	740	0	045	16	695		
13/9/23	16	695			16	695	1	620	15	075		
15/9/23	15	075			15	075	0	495	14	580		
20/9/23	14	580			14	580	0	765	13	815		
21/9/23	13	815			13	815	0	225	13	590		
22/9/23	13	590			13	590	0	585	13	005		
23/9/23	13	005			13	005	0	900	12	105		
25/9/23	12	105			12	105	0	225	11	880		

Fig 4 - Photo of a Stock Book, which Contains the Stock Information for each product.

3. Metadata

Using all the books, I segregated them to two excel sheets, one for inventory/stock data and other for Sales/Bills data. Extracted few columns using the information available.

Inventory Data

Column	Description
Product Name	Name of the Fertilizer
Supplier	Name of Supplier Company
Packaging	Packaging of the Product (in Kgs)
Info Date	Entered Date of the Stock Details
Opening Balance	Stock Balance at the start of Day (in Kgs)
Received Today	Stock Received Today (in Kgs)
Total Opening Balance	Opening Balance + Stock Received Today (in Kgs)
Sales Today	Total Sales Today (in Kgs)
Closing Balance	Total Opening Balance - Sales Today (in Kgs)
Quantity Sold	This feature is extracted by using Sales Today and Packaging, such as ‘Sales Today/Packaging’

Purchase Price Sheet

Column	Description
Product Name	Name of the Fertilizer
Purchase Price	Average Purchase Price of the Fertilizer

Sales Data

Column	Description
Customer Name	Name of the Customer
Village	Village of the Customer
Purchase Date	Date of the Purchase
Items Bought	Item Bought by the Customer
Weight of the Item	Purchase Weight of the Item
Selling Rate	Selling Rate of the Item
Quantity	Number of Quantites of the Item
Amount	otal Amount of the Item, Calculates and 'Selling Rate*Quantity'

4. Descriptive Statistics

I have Collected 6 months of Stock book data from 1st April, 2023 to 30th September, 2023. And the Bill book data from 12th July, 2023 to 30th September, 2023. As of now, other books are on-going data entry.

Access the excel sheet here - subhash_stores_data.xlsx

1. Calculated the Quantity column in inventory, we only had Sales today in the kg units! Hence, I calculated the quantity for further analysis.
   Quantity = Sales Today/Packaging
2. By Utilizing the Quantity, I am able to get Insights into Overall Products preferences over the 6months, and the seasonal insights of the products for the 6 months.
3. Calculated Revenue per each day using the sales data, and calculated the average revenue per month.
   And observed July - Rs.2276, August - Rs.3191, September - Rs.2283
4. Calculated the Quantity of Sales over various villages to get insights into customers from villages that visit the most.

Fig 4.1 Quantity Sold for Various Products over 6 months - Overall Products Preference

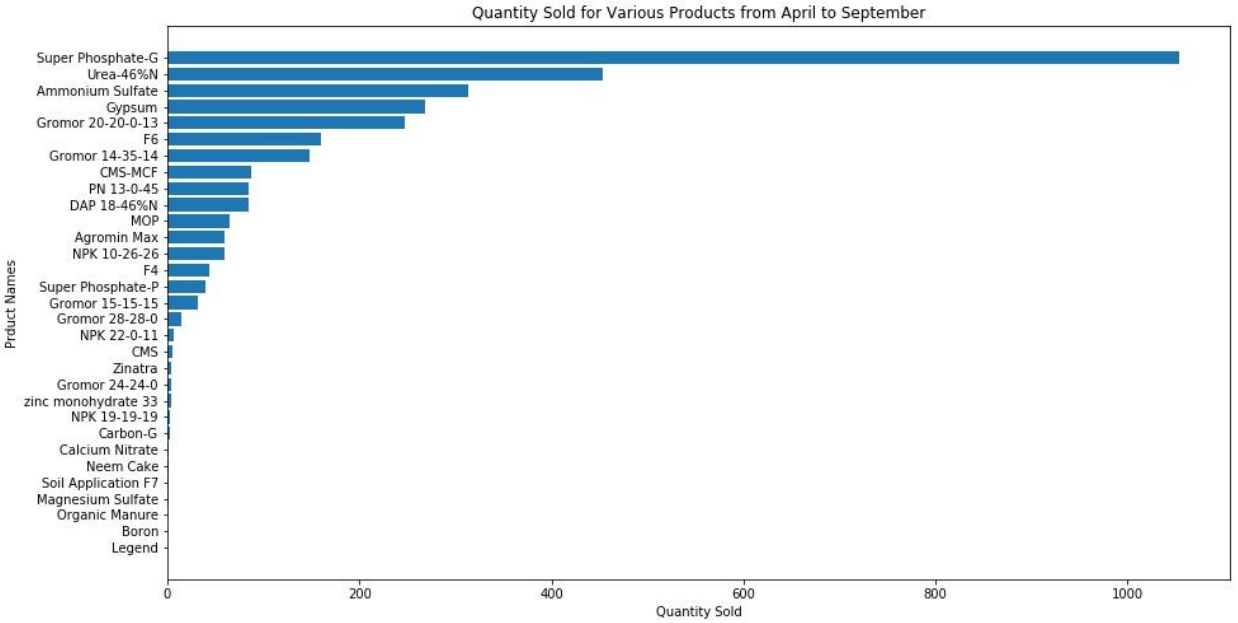


Fig 4.2 Observing Quantity Sold for various products for each month - seasonal Insights

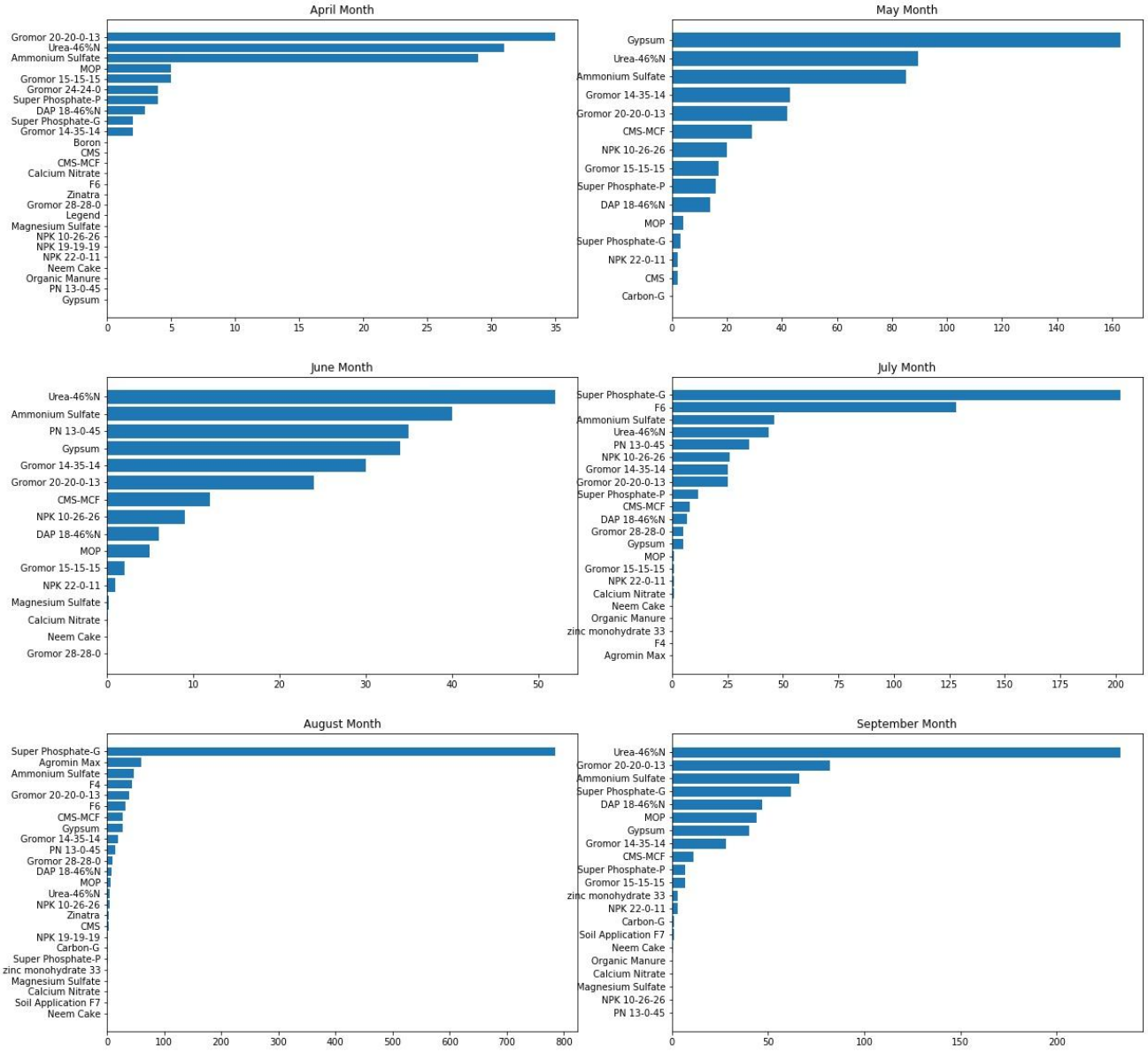


Fig 4.3 Revenue Trend over past 2.5 months

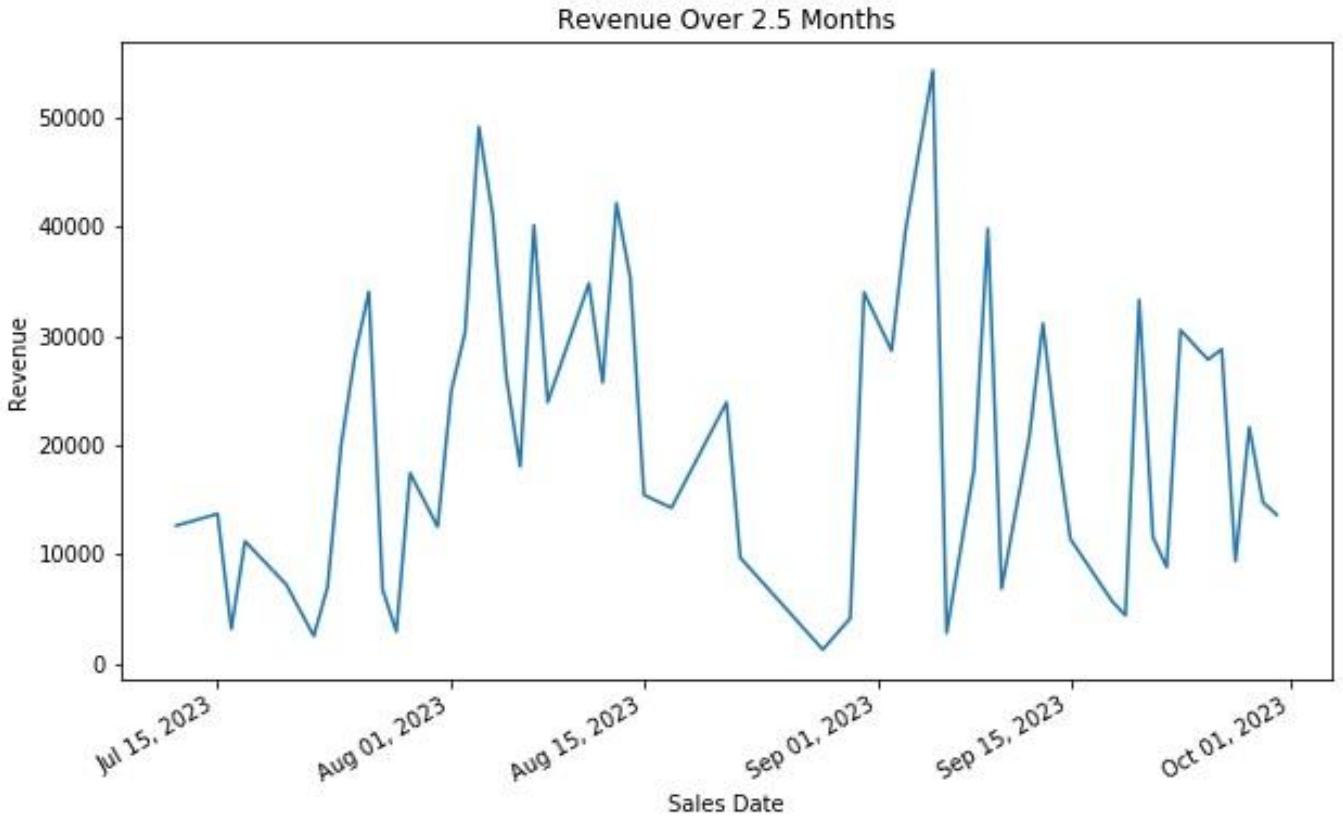


Fig 4.4 Village vs Quantity of Sales Distributoin

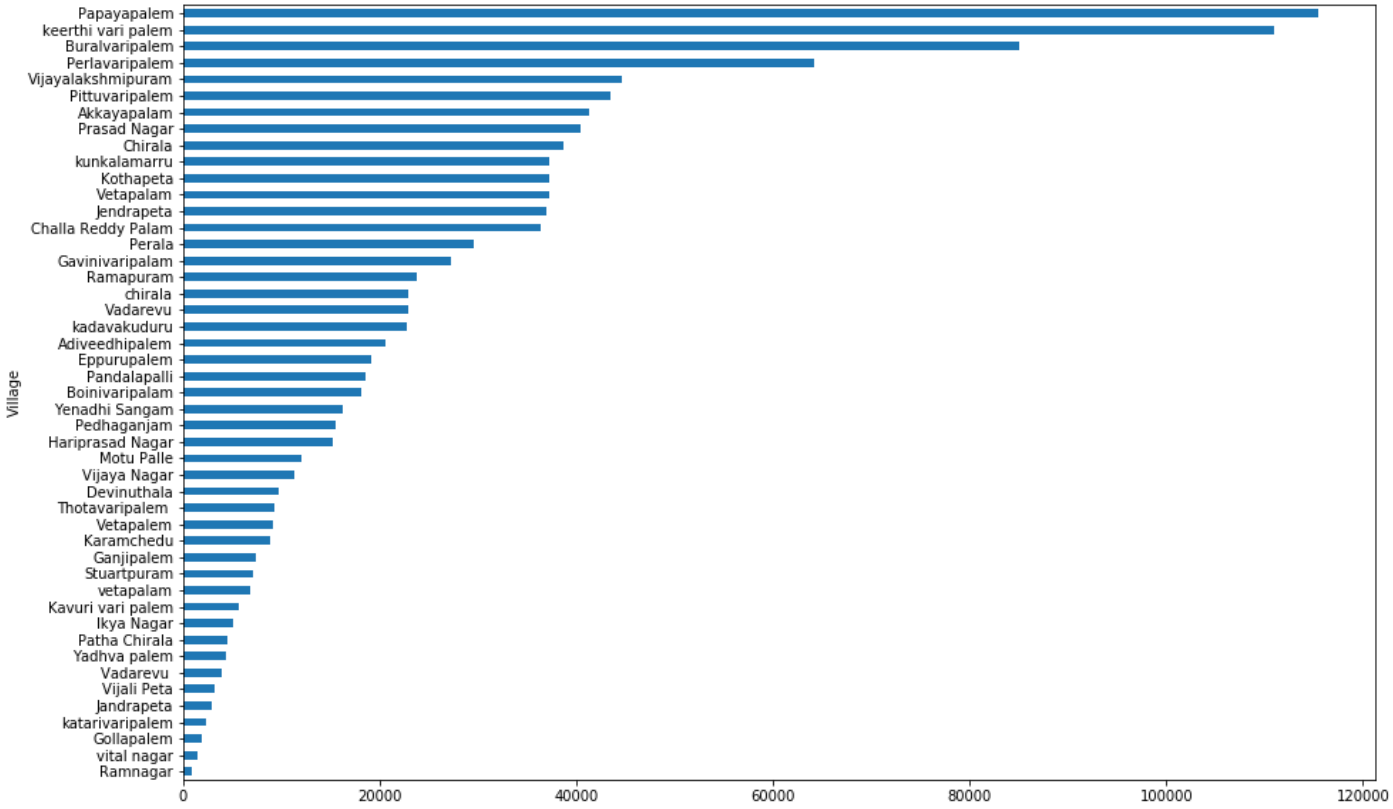
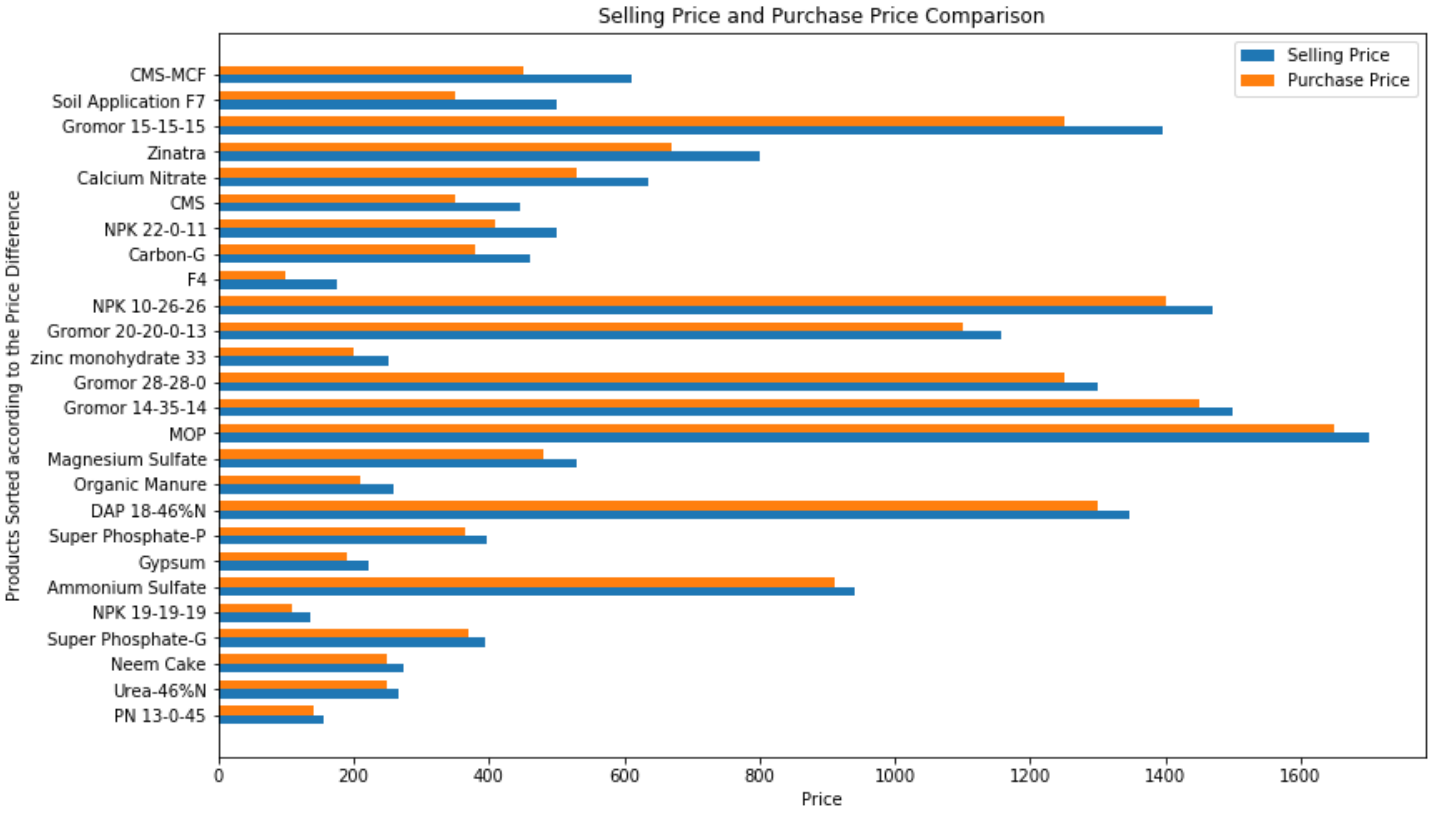


Fig 4.5 Avg. Selling Price vs Avg. Purchase Price



Analysis processes and methods

Firstly, I digitalized the collected data using excel, created an inventory sheet, sales sheet, and prices sheet. Once I digitialized the data, I organized and cleaned the data using pandas library of python in jupyter notebook.

The Cleaning Process Involved, Some dates were entered wrong, and they had to be corrected. Some village names were duplicated (such as Perala, perala), they had to be cleaned. After the cleaning process, Started the first level analysis, and on observing the inventory data, I felt I couldn't do much comparable analysis as the columns are in kgs, and the packaging may vary from product to product. So to make it properly comparable, I calculated the Quantity column by dividing the Sales with packaging.

Upon Obtaining the Quantity column, I grouped the products based on product name and calculated the sum of quantity for each product, You can observe it Fig4.1, this gave me understanding on the products preferences over the 6 months. Then to get more seasonal insights, I calculated a month column, and for each month, I repeated the above process and made a plot Fig4.2.

After understanding the products preferences, I moved on to observe the Revenue. I used the sales data to calculate the revenue, as the selling price keeps varying. I grouped the sales data based on date and calculated the sum of the revenue for those dates, which gave me revenue trend over the past 2.5 months, observe it in Fig 4.3.

Using the sales data, I grouped the villages and calculated the total sum of the quantity of items purchased by each village, to get understanding of the villages that visit often, Fig 4.4. And then I took the top4 villages and observed their products preferences.

Finally, took an average of sales price, and with the help of owner got the average of purchase price, and observed them in Fig 4.5. Moving further I plan to collect more data and get more insights into the products preferences, and with that understanding I plan to improve the inventory management, and get insights into customer purchase patterns more clearly.

Results and Findings

Based on the analysis, and the charts plotted, there are several findings, such as:

1. By plotting the Overall Products preferences, I picked the top 5 most sold products such as 'Super Phosphate-G', 'Urea-46%N', 'Ammonium Sulfate', 'Gypsum', 'Gromor 20-20-0-13'. And Calculated Basic Statistics for them.

Proudct Super Phosphate-G Descriptive Analysis

	Total Opening Bal	Received Today	Sales Today	Closing Bal
count	38.000000	38.000000	38.000000	38.000000
mean	6918.421053	1447.368421	1386.842105	5531.578947
std	6459.472628	4919.335093	1624.503426	5557.444740
min	300.000000	0.000000	0.000000	200.000000
25%	2912.500000	0.000000	100.000000	1987.500000
50%	5450.000000	0.000000	600.000000	3400.000000
75%	9787.500000	0.000000	3025.000000	6237.500000
max	25200.000000	25000.000000	5350.000000	24100.000000

From this, we can see that minimum of Total Opening balance was even having 300kgs! Considering that it is the most selling product, It is advisable to atleast keep 50% Percentile of the sales, that would be atleast 600kgs! This is the first level

observation, moving further I intend to calculate Reorder point for these products, to optimize the inventory management.

2. As this business is a seasonal business where the 80% of sales will happen in winter and Rainy seasons, it is appropriate to check the seasonal trends, hence i made the plots to check the popularity of products in each month. By looking at the Fig 4.2, we can say that in the Summer season (April-June), urea-46%N was always in top2, and Ammonium Sulfate was always in top3. So we can say that in summer season, on first level analysis, these stocks total opening balance can be maintained at 50% Percentile of Sales, which would potentially not loose customer.

3. Revenue Trend supports the fact that from August the sales are increasing, however need more data to get more insights on this section, it is work in progress as the bill books are taking a lot of time to enter to excel!

4. Using the sales data, I made Horizontal bar plot on Fig4.4, to get understanding on the top 5 visited villages, and i dig deep to see what are the products popularity from these top 5 villages in Fig 4.5, and observed that super phosphate G is the most popular and this is for the rainy season. Similarly, will be plotting for all different seasons, to see the products needed for popular villages in various seasons.

5. In the Prices sheet, I calculated the average selling price using sales data, and the average purchase price was told by the owner. So using this data, made the plot Fig 4.6, which gave insights into the profitable products, if we take the top 5, they are CMS-MCF, Soil Application F7, Gromor 15-15-15, Zintara, Calcium Nitrate.

— Will be making more plots and more insights from the data by final report –

THANK YOU.