Optimizing Retail Sales and Stock Management for Sahu Cloth House

A Proposal Report for the BDM Capstone Project

Submitted by:

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1. Executive Summary

This project examines the operational performance of Sahu Cloth House, a multi-category retail store that deals in apparel, household items, packaged food, and wellness supplements.

The business issues that could be extracted from the interaction with the owner are as follows:

● The company is experiencing volatile weekly revenues with significant variations impacting cash
flow management.

● Being unable to ensure optimal stock levels, both stockouts of high-demand products and overstocking of slow-selling items.

● Struggling to determine how product categories create profitability versus how they lock up capital with an insufficient return.

The method used to accomplish this capstone project is as follows:

● Step 1: Defining our goals

● Step 2: Deciding how to measure goals

● Step 3: Collecting the data

● Step 4: Analysing our data

● Step 5: Visualise and interpret results

The first two steps were done in the project proposal, and the objective selected was to Optimize the sales performance and inventory management of the chosen retail company. Later, data were gathered and pre-processed from the company's sales records for a 12-week period (*February-April 2025*).

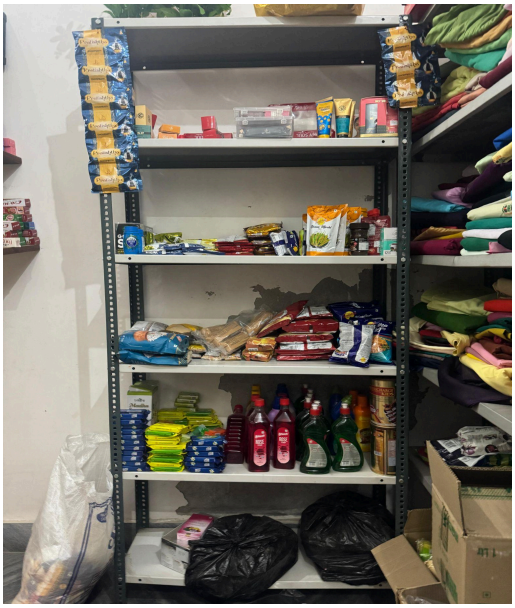
The raw data obtained from Sahu Cloth House is elaborated in detail under the Metadata section.

The data has also been explained through descriptive statistics that assisted in decomposing the data and inferring the narrative that the data can reveal.

Pictorial presentation of data has also been provided for visualization as well as proper understanding of the data obtained, such as Pareto charts, ABC classification matrices, and trend analyses.

2. Proof of Originality

Shop Stocks



Shop Owner

Purchasing Bill

Swadeshi Pick Up Center
., Madina, Rohtak, Haryana, Pin Code: 124001 Contact No: 09961937367, 8607003242
FSSAI Licence No: 10822018000008

BILL OF SUPPLY

Name	:	Monti
Pan No.	:	
Id/Reference No.	:	60261590
Invoice No.	:	1260
Invoice Date	:	11/04/2025
GST No.	:	

Product Name	Qty	Rate	Amt	Total Amt
Nutricharge Woman (Pkt.)	3	320	960	960
Green Tea (20 bags)	7	120	840	840
Jasmine Soap (Pcs.)	9	45	405	405
Red Chilli Powder (100gm)	5	30	150	150
Rice Bran Oil (Lts.)	8	70	560	560
Nutricharge veg omega (Pcs.)	11	280	3080	3080
Dish Soap Bar (Pcs.)	7	10	70	70
Aata Noodles (Pkt.)	6	20	120	120
Ladies Slippers (Pairs)	3	170	510	510
Bizz Detergent Powder (Pkt.)	8	40	320	320
Nutricharge bioage (Pcs.)	8	900	7200	720
Aaloo Bhujia (Pkt.)	12	70	840	840
Men's Shirt (Pcs.)	8	500	4000	4000
Chaat Masala (100gm) (Pkt.)	6	38	228	228
Gamma Oryznol (Pcs.)	2	350	700	700
Ladies Suit (Pcs.)	10	1100	11,000	11,000
Pasta (Pkt.)	13	32	416	416
Liquid Handwash (200ml) (Pcs.)	10	45	450	450
Coconut Oil (175ml) (Pcs.)	5	65	325	325
Amla Candy (200gm) (Pkt.)	5	65	325	325
Coconut Biscuits (Pkt.)	7	20	140	140

Total Amount	:	32,639.00
Discount	:	0.00
Round Off	:	1.00
Bill Value	:	**32,640.00**
Deduct Balance	:	0.00
Deduct Offer Amt	:	0.00
Net Amount Payable	:	**32,639.00**

Letter of Authorisation:

Letter of Authorization (1).pdf

Discussion with Owner:

Diiscussion With Owner.mp4

3. Metadata and Descriptive Statistics

3.1 Metadata (Excel Workbook Structure)

Link to project data: Sahu cloth house

There are mainly 4 worksheets - Sales, Revenue, Weekly Revenue Data and Calculations

3.1.1 Sheet: Sales

PRODUCT NAME	Unit Rate (â‚¹)	Wk1 (Feb3)	Wk2 (Feb10)	Wk3 (Feb17)	Wk4 (Feb24)	Wk5 (Mar3)	Wk6 (Mar10)

Wk7 (Mar17)	Wk8 (Mar24)	Wk9 (Mar31)	Wk10 (Apr7)	Wk11 (Apr14)	Wk12 (Apr20)	Total

- PRODUCT NAME: The name of each product sold by Sahu Cloth House.
- Unit Rate (₹): The selling price per unit for each product.
- Wk1 (*Feb 3*) to Wk12 (*Apr 20*): The number of units sold for each product in each specific week, from week 1 to week 12.
- Total: The total quantity sold for each product across all 12 weeks.

3.1.2 Sheet: Revenue

PRODUCT NAME	Opening Balance(in Rs.)	Sale	Sale Return	Purchase

- PRODUCT NAME: The name of each product.
- Opening Balance (in Rs.): The value of the stock on hand (in rupees) for each product at the start of the period.
- Sale: The total number of units sold for each product during the period.
- Sale Return: The number of units returned by customers for each product.
- Purchase: The number of units purchased for restocking during the period.

3.1.3 Sheet: Weekly Revenue Data

Week	Total Sale Amount	Account	Cash Balance

- Week: The week number (1 to 12) corresponds to each sales period.
- Total Sale Amount: The total revenue generated each week from all products.
- Account: The amount credited to the business account for the week.
- Cash Balance: The cash remaining at the end of each week.

3.2 Descriptive Statistics

Name of the Item	Total Sale	Max Sale	Min Sale	Revenue Generated (Rate * Total sale)
Ladies' Suit (Pcs.)	77	9	4	138600
Men's Shirt (Pcs.)	10	2	0	7990
Ladies Slippers (Pairs)	93	10	5	46407
Dish Soap Bar (Pcs.)	52	6	3	3120
Bizz Detergent Powder (Pkt.)	44	6	1	20240
Amla Candy (200gm) (Pkt.)	79	11	3	12640
Green Tea (20 bags) (Pkt.)	22	3	1	5720
Coconut Oil (175ml) (Pcs.)	71	9	3	7100
Atta Noodles (Pkt.)	181	20	12	7240
Coconut Biscuits (Pkt.)	121	12	8	4840
Aaloo Bhujia (Pkt.)	95	12	5	10450
Red Chilli Powder (100gm) (Pkt.)	67	10	2	3350
Chaat Masala (100gm) (Pkt.)	32	6	0	1920
Jasmine Soap (Pcs.)	46	6	2	3680
Nutricharge Woman (Pkt.)	15	3	0	7350
Gamma Oryzanol (Pcs.)	1	1	0	570
Nutricharge Bioage (Pcs.)	4	2	0	6000
Nutricharge Veg Omega (Pcs.)	3	1	0	1380
Rice Bran Oil (Lts.)	40	5	1	4800
Pasta (Pkt.)	66	11	2	3960
Liquid Hand Wash (200ml) (Pcs.)	76	10	2	6080
Total	1195			303437

Descriptive statistics were generated through Excel operations like MAX, MIN, and SUM to examine the 12-week sales of all the products. This enabled easy and immediate determination of trends, best-sellers, and worst-sellers.

Key Insights:

- **Best Seller**: Atta Noodles with 181 units sold.
- **Lowest Seller**: Gamma Oryzanol with a mere 1 unit being sold.
- Some products (*e.g., Men's Shirt, Nutricharge Bioage, Gamma Oryzanol*) were unsold for weeks, demonstrating sporadic demand.
- **Highest Revenue**: Ladies' Suit, with Rs. 1,38,600.
- Items such as *Ladies Slippers* and *Atta Noodles* were topping weekly, while others were down throughout.

These summary statistics allowed one to ascertain which products consistently comprise total sales and which can gain from **inventory or sales strategy realignment**.

3.3 Data Cleaning and Normalization

I started the data-cleaning and normalization by merging product and sales records and other tables, standardizing product names, spotting duplicates and removing them, addressing missing values, and verifying omissions with inventory logs, making the dataset more informative and more streamlined.

Collaborative efforts were used to address outliers resulting from anomalies. Metadata, audit trails, and precise calculations ensured transparency and accountability. The project's data analysis methods and outcomes contribute to an ongoing cycle of improvement. Feedback with the owner enabled continuous data refinement, resulting in a reliable dataset ready for analysis.

4. Detailed Explanation of Analysis Process/Method

4.1 Analytical Framework and Methodology

The research methodology employs multiple analytical approaches to ensure the comprehensive generation of business insights. Primary analytical frameworks include ABC

Analysis for inventory categorization, Pareto Analysis for revenue concentration assessment, and statistical testing for hypothesis validation.

- **ABC Analysis:** Products categorized by revenue into A (high), B (medium), and C (low) for targeted resource focus.
- **Statistical Methods**: Used t-tests and R-squared analysis to validate performance differences and trends.
- **Performance Metrics:** Evaluated sales volume, revenue, market share, and efficiency, with weekly tracking to detect trends and seasonality.

4.2 ABC Analysis Implementation

4.2.1 Classification Methodology

For our ABC Analysis, I am sticking to the proven methods of inventory management. This means classifying items based on their annual consumption value and how much revenue they contribute, which really helps us prioritize.

I am applying the Pareto Principle. That means *Category A* products are responsible for about **70-80%** of our total revenue, *Category B* for 15-25%, and *Category C* for the final 5-10%.

Name of the Item	Total Sale	Revenue Generate	Cummulative Va	Cumulative %	ABC Category
Ladies Suit (Pcs.)	77	138600	138600	0.456766973	A
Ladies Slippers (Pairs)	93	46407	185007	0.6097048152	A
Bizz Detergent Powder (Pkt.)	44	20240	205247	0.6764072938	A
Amla Candy (200gm) (Pkt.)	79	12640	217887	0.7180633871	A
Aaloo Bhujia (Pkt.)	95	10450	228337	0.7525021668	A
Men's Shirt (Pcs.)	10	7990	236327	0.7788338271	A
Nutricharge Woman (Pkt.)	15	7350	243677	0.8030563181	B
Aata Noodles (Pkt.)	181	7240	250917	0.8269162956	B
Coconut Oil (175ml) (Pcs.)	71	7100	258017	0.8503148924	B
Liquid Handwash (200ml) (Pcs.)	76	6080	264097	0.8703520006	B
Nutricharge bioage (Pcs.)	4	6000	270097	0.8901254626	B
Green Tea (20 bags) (Pkt.)	22	5720	275817	0.9089761631	B
Coconut Biscuits (Pkt.)	121	4840	280657	0.9249267558	B
Rice Bran Oil (Lts.)	40	4800	285457	0.9407455254	B
Pasta (Pkt.)	66	3960	289417	0.9537960104	C
Jasmin Soap (Pcs.)	46	3680	293097	0.9659237338	C
Red Chilli Powder (100gm) (Pkt.)	67	3350	296447	0.9769639167	C
Dish Soap Bar (Pcs.)	52	3120	299567	0.987246117	C
Chaat Masala (100gm) (Pkt.)	32	1920	301487	0.9935736248	C
Nutricharge veg omega (Pcs.)	3	1380	302867	0.9981215211	C
Gamma Oryznol (Pcs.)	1	570	303437	1	C

4.3 Pareto Analysis and Revenue Concentration

4.3.1 80/20 Rule Validation

What our Pareto Analysis confirmed is that Sahu Cloth House's product portfolio follows the classic 80/20 rule.

We can see that we've got 7 products, which is only about 33% of everything we offer, yet they're generating a significant **Rs. 2,42,527**—almost 80% of our total revenue. This strongly confirms that our strategic focus on these key performers is paying off.

4.3.2 Long Tail Analysis

That means the other 14 products—a full 67% of our range—only bring in 20.1% of our total revenue. They represent the '**long tail**' of our business.

Even though these products don't move as much volume on their own, they actually play some really important strategic roles. They help us keep customers by offering more choices, ensure we're covering all sorts of price points, open up opportunities to cross-sell, and help us stand out from competitors.

4.4 Statistical Analysis and Hypothesis Testing

4.4.1 T-Test Implementation:

I ran t-tests to check our theories about how products perform differently and to confirm patterns in our revenue distribution.

What our analysis clearly showed us is that there are some truly significant differences across various product categories and how they're performing. That's really strong evidence for us to lean into strategic differentiation.

Test Pricing for Ladies Suit	
Week	Sales
1	5
2	4
3	4
4	5
5	6
6	5
7	7
8	8
9	7
10	9
11	8
12	9
T-test	0.00006663682588
R-Squared	0.8376927813

4.4.2 R-Squared Analysis for Trend Correlation

When I ran the R-squared analysis, it became pretty clear that for our mid-range products, sales and revenue are tightly linked. There's a strong correlation there.

We noticed that weekly performance had a moderate link with seasonal trends. Plus, there are distinct patterns connecting our product categories to what customers prefer.

4.5 Summary of Method Appropriateness

The methods I used are robust enough methodologically, but also practical for a small retail business like Sahu Cloth House. By combining ABC Analysis, Pareto Analysis, and some basic stats, I get:

1. **Data Accessibility**: It's great because these methods just use the sales and revenue data we already have on hand.
2. **Interpretability**: The results are easy for business owners to understand.
3. **Scalability**: Framework can be maintained and updated with ongoing business data
4. **Cost-Effectiveness**: Cheap because no specialized software or extensive training is required.
5. **Problem Alignment**: These methods directly address the identified challenges of our inventory optimization and revenue concentration.

This methodological approach prioritizes practical business value over analytical sophistication, making it most appropriate for the specific context of operational challenges and data availability constraints.

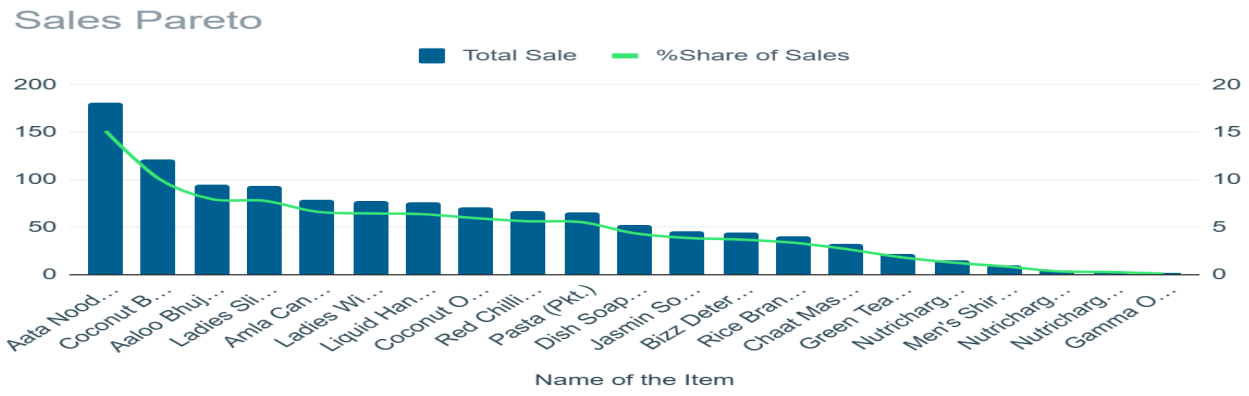
5. Results and Findings

The visualizations in the sheet provide a comprehensive overview of sales and inventory performance, directly reflecting the calculations and metrics from the calculation sheet.

5.1 Sales Pareto:

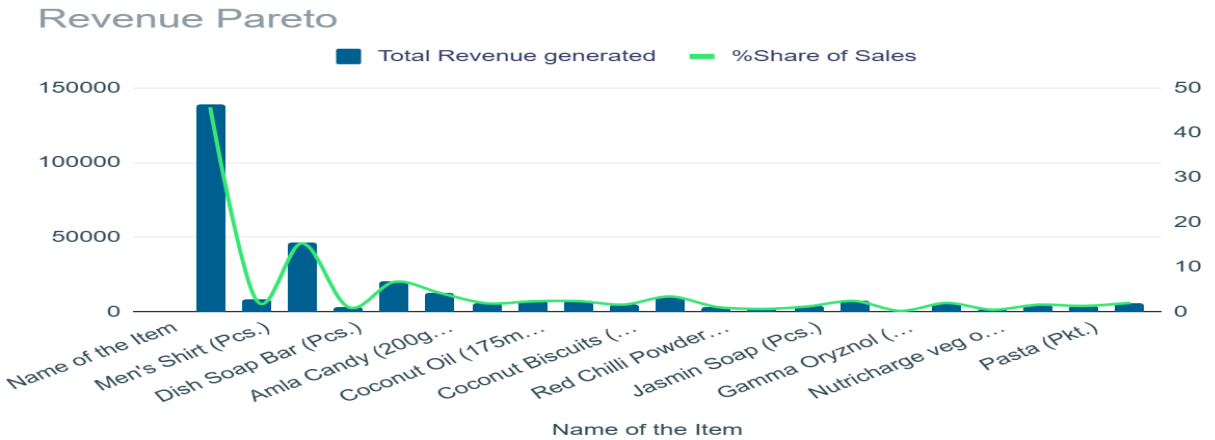
- Only a few products—like Ladies' Suit, Atta Noodles, and Slippers—are actually bringing in most of our sales.
- We can see that 20-30% of our items account for 70-80% of total sales (Pareto Principle).

- So, we have to prioritize these top-sellers in inventory management and our sales approach.



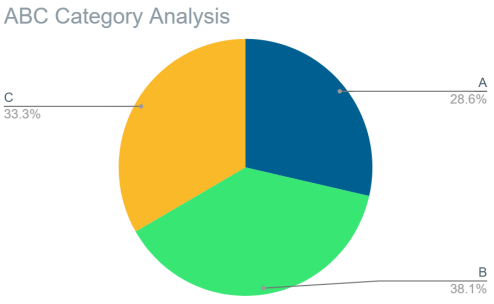
5.2 Revenue Pareto:

- Revenue is highly concentrated, led by *Ladies' Suits,* followed by *Slippers* and *Bizz detergent.*
- The cumulative revenue curve confirms that only a few items are bringing more revenue.
- So, with ABC analysis, *Category A* products are highly important.



5.3 ABC Category Analysis:

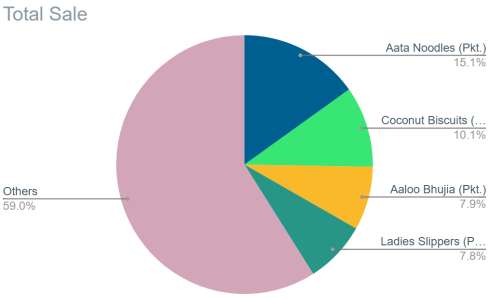
- Products are divided into A, B, and C categories based on their revenue contribution.



- *Category A* (top ~33% of products) generates nearly 80% of total revenue.
- *Category B* contributes about 16%, and *Category C* just 4%, which means high-impact (*Category A*) items are more important for inventory management.

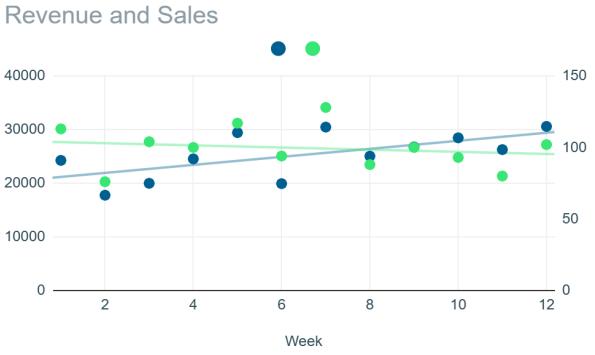
5.4 Total Sale:

- The chart shows that *Atta Noodles, Coconut Biscuits,* and *Ladies Slippers* are the highest-selling items by unit volume.
- A lot of our other products barely bring in any revenue, pointing to the **long tail** of items that move in very small volumes.



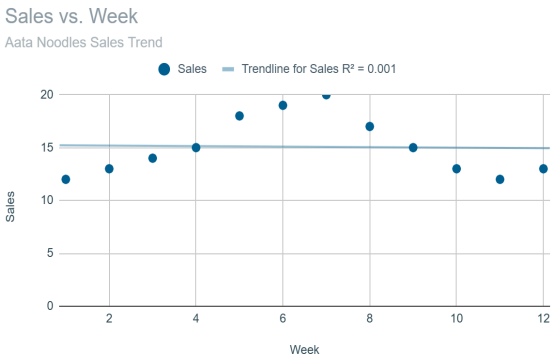
5.5 Revenue and Sales Trend:

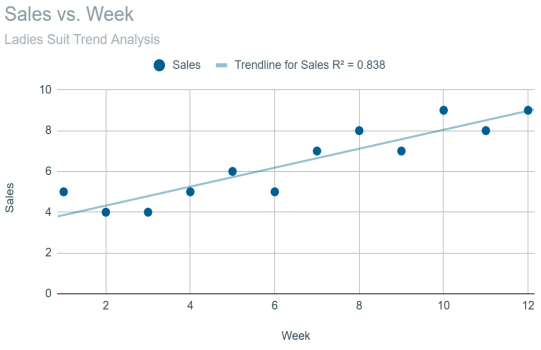
- The trend line shows that there is a positive relationship between weekly sales and revenue.
- Weeks with higher sales volumes generally correspond to higher revenue, which means a strong relationship for high-value items.



5.6 Sales vs. Week (Trend Analysis):

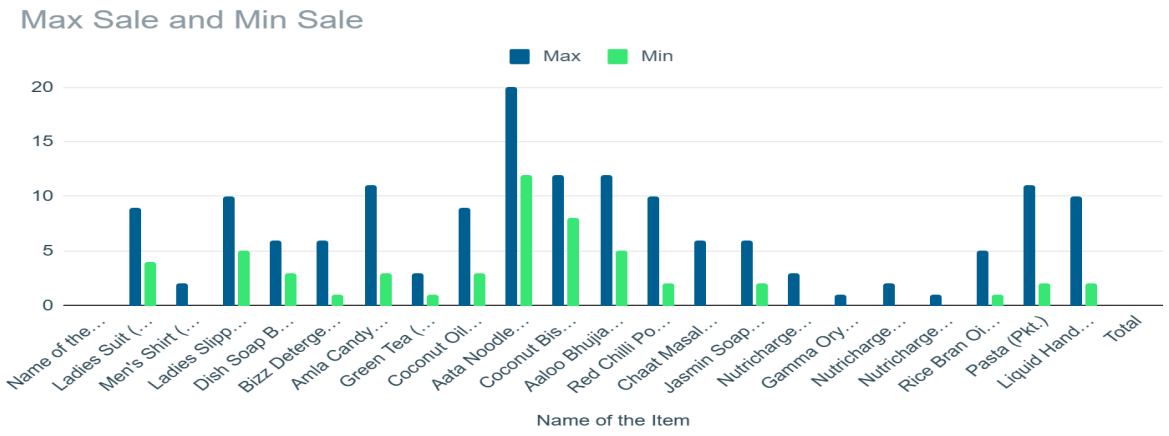
- Individual trend charts (*e.g., for Ladies Suits and Atta Noodles*) reveal that *Ladies Suits* show an upward trend, showing a positive slope with **$R^2 = 0.838$**.
- While *Atta Noodles* shows a lightly declining trend (R^2 near zero), suggesting different demand patterns and seasonality for these products.





5.7 Max Sale and Min Sale:

- This chart just how volatile(ups and downs) the sales are for each product.
- It shows which items have consistent sales and which have sporadic or zero sales in some weeks, such as *Gamma Oryzanol* and *Nutricharge Veg Omega*, which sometimes don't even sell at all.



5.8 Weekly Sale Amount:

- The bar chart shows significant fluctuations in total weekly revenue.
- There's a clear dip in sales during **Week 10**, which directly matches some operational issues we identified in our calculations and analysis.