BUSINESS DATA MANAGEMENT

MID-TERM SUBMISSION

Empowering Business Growth through Data-Driven Insights

NAME: LAKSHIKA SHEORAN

EMAIL ID: 22f2001175@ds.study.iitm.ac.in

ROLL NO: 22f2001175

EXECUTIVE SUMMARY AND TITLE

Title: Empowering Business Growth through Data-Driven Insights

Pradeep Maan Trading Company is engaged in the direct sale of fertilizers, urea etc to farmers, operating within a B2C (business-to-consumer) market. Their services have proven to be beneficial to the agricultural community, providing essential products that support crop growth and farm productivity.

The objective of this study is to analyze sales and purchase trends and optimize inventory management over a three-month period, from April 1, 2024, to June 30, 2024. The data used in this analysis is sourced from the digital records maintained by the company.

The analysis was conducted using descriptive statistical techniques and data visualization tools. The data was carefully cleaned and processed and analyzed using Excel. Various statistical measures, including mean, mode, median and standard deviation, were calculated. To visually represent key metrics such as profit margins, revenue, sale prices, and purchase prices, various charts—such as column charts, bar charts, and pie charts—were employed.

Key findings from the analysis reveals that DAP, NPK and urea are the highest revenue-generating items, with a notable upward trend in daily revenue. Menaka 71, Missile Chloropyriphos 15% DP 100gm and Cotton Seed Katha BG-II exhibit high-profit margins, while DAP, NPK and Urea have lower margins. Price stability was observed for items like Cotton Seed S-004, Menaka 71, Missile Chloropyriphos 15% DP 100gm, Pandy CS ICHIBAN 700ML, Cotton Seed Katha BG-II, SSG SX-175 kg whereas significant price variations were noted for NPK, DPK and Urea. The analysis also identified significant markups in items like Cotton Seed Katha BG-II, SSG SX-17 5KG, Menaka 71, Pandy CS ICHIBAN 700ML indicating effective pricing strategies.

In conclusion, this report outlines a data-driven approach to addressing the challenges faced by Pradeep Maan Trading Company. Through meticulous analysis, this project aims to enhance profitability and optimize inventory management, enabling Pradeep Maan Trading Company to thrive in the retail market.

2) PROOF OF ORIGINALITY OF DATA

- **DETAILS**

Name: PRADEEP MAAN TRADING COMPANY

Name Of Owner: PRADEEP MAAN

Address - KHERA DISTRICT, LOHARU, HARYANA

- **ABOUT**

The project focuses on B2C middle-sized business located at Loharu, Haryana. Pradeep Maan Trading Company, founded in March 2023 with 1-2 employees, focuses on selling a variety of seeds, fertilizers and urea crucial for farmers in crop production. The company has shown steady profit growth, indicating a strong beginning in the business.

- **VIDEO**

Created the video with the owner of the shop who handles the business. Have discussed in detail about introduction and working of business. – Link1: click here

- **LETTER DULY SIGNED & STAMPED FROM AN ORGANISATION-** Link 2: click here
- **IMAGES**

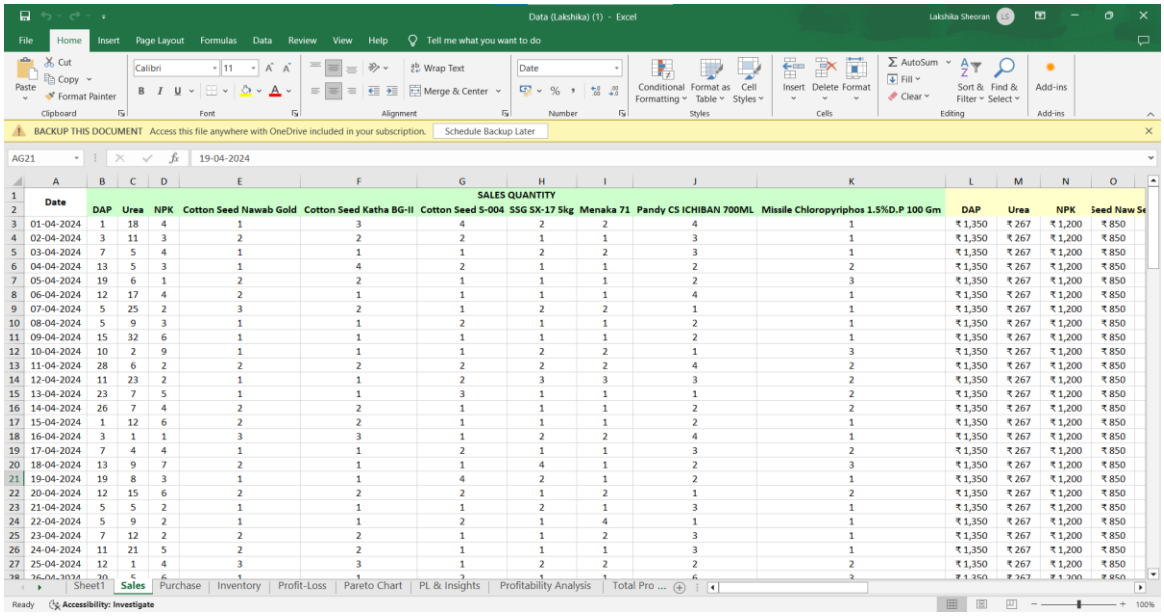
It includes the pictures of the shop storage area, paytm platform, picture of me with the owner, picture of shop storage area.

  - Photo of the owner with myself- Link3: click here
  - Photo of the Payment Platform- Link4: click here
  - Shop Storage area- Link5: click here
  - Photo of the shop- Link6: click here

3) METADATA AND DESCRIPTIVE DATA

I had collected the dataset covering the period from April 1st,2024 to June 30th, 2024. This dataset for the entire timeframe, is essential for analyzing and gaining insights for my project.

➢ METADATA



SALES QUANTITY															
Date	DAP	Urea	NPK	Cotton Seed Nawab Gold	Cotton Seed Katha BG-II	Cotton Seed S-004	SSG SX-17 5kg	Menaka 71	Pandy CS ICHIBAN 700ML	Missile Chloropyriphos 1.5%D.P 100 Gm	DAP	Urea	NPK	Seed Naw Se
01-04-2024	1	18	4	1	3	4	2	2	4	1	₹1,350	₹267	₹1,200	₹850
02-04-2024	3	11	3	2	2	2	1	1	3	1	₹1,350	₹267	₹1,200	₹850
03-04-2024	7	5	4	1	1	1	2	2	3	1	₹1,350	₹267	₹1,200	₹850
04-04-2024	13	5	3	1	4	2	1	1	2	2	₹1,350	₹267	₹1,200	₹850
05-04-2024	19	6	1	2	2	1	1	1	2	3	₹1,350	₹267	₹1,200	₹850
06-04-2024	12	17	4	2	1	1	1	1	4	1	₹1,350	₹267	₹1,200	₹850
07-04-2024	5	25	2	3	2	1	2	2	1	1	₹1,350	₹267	₹1,200	₹850
08-04-2024	5	9	3	1	1	2	1	1	2	1	₹1,350	₹267	₹1,200	₹850
09-04-2024	15	32	6	1	1	1	1	1	2	1	₹1,350	₹267	₹1,200	₹850
10-04-2024	10	2	9	1	1	1	2	2	1	3	₹1,350	₹267	₹1,200	₹850
11-04-2024	28	6	2	2	2	2	2	2	4	2	₹1,350	₹267	₹1,200	₹850
12-04-2024	11	23	2	1	1	2	3	3	3	2	₹1,350	₹267	₹1,200	₹850
13-04-2024	23	7	5	1	1	3	1	1	1	2	₹1,350	₹267	₹1,200	₹850
14-04-2024	26	7	4	2	2	1	1	1	2	1	₹1,350	₹267	₹1,200	₹850
15-04-2024	1	12	6	2	2	1	1	1	2	1	₹1,350	₹267	₹1,200	₹850
16-04-2024	3	1	1	3	3	1	2	2	4	1	₹1,350	₹267	₹1,200	₹850
17-04-2024	7	4	4	1	1	2	1	1	3	2	₹1,350	₹267	₹1,200	₹850
18-04-2024	13	9	7	2	1	1	4	1	2	3	₹1,350	₹267	₹1,200	₹850
19-04-2024	19	8	3	1	1	4	2	1	2	1	₹1,350	₹267	₹1,200	₹850
20-04-2024	12	15	6	2	2	2	1	2	1	2	₹1,350	₹267	₹1,200	₹850
21-04-2024	5	5	2	1	1	1	2	1	3	1	₹1,350	₹267	₹1,200	₹850
22-04-2024	5	9	2	1	1	2	1	4	1	1	₹1,350	₹267	₹1,200	₹850
23-04-2024	7	12	2	2	2	1	1	2	3	1	₹1,350	₹267	₹1,200	₹850
24-04-2024	11	21	5	2	2	1	1	1	3	1	₹1,350	₹267	₹1,200	₹850
25-04-2024	12	1	4	3	3	1	2	2	2	2	₹1,350	₹267	₹1,200	₹850

Figure1: Snapshot of data

Column Name	Description
Date	This column indicates the date on which each transaction occurred, formatted as DD-MM-YYYY
Item Name	This column specifies the name of the item that was sold or purchased. It provides information on all the items involved in each transaction.
Quantity	This column displays the quantity of each product that was sold or purchased. It is a crucial factor used in all subsequent processes and analyses.
Rate	This column contains the price of each item per unit. This information is essential for calculating revenue and analyzing financial performance.
Amount	This column represents the revenue generated from each transaction, calculated by multiplying the quantity of the item by its unit price.

Transaction Type	This sheet provides detailed information about all sales transactions, including item names, quantities, prices, and revenue generated.
• SALE	
• PURCHASE	This sheet contains information on all purchase transactions, detailing the items acquired, their quantities, purchase prices, and total expenditure.
• INVENTORY	This sheet offers insights into the current inventory, tracking the quantities of items available, and helping manage stock levels based on sales and purchases.

TABLE 1: METADATA

➢ DESCRIPTIVE STATISTICS

	SALES	PURCHASES	INVENTORY
Mean	₹ 28,399.86	₹ 28,777.20	₹ 770.37
Median	₹ 23,475.00	₹ 0.00	₹ 772.00
Mode	₹ 0.00	₹ 0.00	₹ 574.00
Standard Deviation	₹ 12,781.28	₹ 95,116.44	₹ 153.26
Kurtosis	0.83	26.34	-0.59
Skewness	1.04	4.89	-0.13
Range	₹ 63,685.50	₹ 6,57,850.00	₹ 662.00
Minimum	₹ 5,136.50	₹ 0.00	₹ 416.00
Maximum	₹ 68,822.00	₹ 6,57,850.00	₹ 1,078.00
Sum	₹ 25,84,387.16	₹ 26,18,725.00	₹ 70,104.00
Count	91	91	91

TABLE 2 - DESCRIPTIVE STATISTICS

SALES

- MEAN is: ₹ 28,399.86 - This is the average sales per entry. ***=AVERAGE(range)***
- Standard Deviation: ₹ 12,781.28 - Indicates substantial spread around the mean, pointing to high volatility in sales data. ***=STDEV.S(range)***

- Median: ₹ 23,475.00- indicates that half of the sales are below this value, showing skew towards higher sales. ***=MEDIAN(range)***

- Mode: ₹0.00 ***=MODE.SNGL(range)***
- Kurtosis: 0.83 – suggests the data distribution is close to normal but slightly fewer outliers compared to a normal distribution. ***=KURT(range)***
- Skewness: 1.04 – positive skewness indicates distribution where most sales are concentrated on the lower side, with a few higher outliers. ***=SKEW(range)***
- Range: ₹63,685.50 – It suggests significant variability in sales values. Difference between the highest and lowest sales values. ***=MAX(range)-MIN(range)***
- Minimum: ₹5,136.50 - The lowest sales value. ***=MIN(range)***
- Maximum: ₹68,822.00 - The highest sales value. ***=MAX(range)***
- Sum: ₹25,84,387.16 - Total sales over the period. ***=SUM(range)***
- Count: 91 - Number of sales observations. ***=COUNT(range)***

PURCHASE

- Mean: ₹28,777.20 - The average purchase amount, it is quite close to the mean sales value, suggesting a balanced relationship between purchases and sales.
- Standard Deviation: ₹95,116.44
- Median: ₹0.00
- Kurtosis: 26.34 & Skewness: 4.89 – suggests a few large outliers dominates purchases, indicating irregular or uneven purchasing patterns.
- Range: ₹6,57,850.00 – A very large range highlights significant outlier(s) in the purchase data, as reflected in the skewness and kurtosis.
- Minimum: ₹0.00 - The lowest purchase value.
- Maximum: ₹6,57,850.00 - The highest purchase value.
- Sum: ₹26,18,725.00 - Total purchases over the period.
- Count: 91 - Number of purchase observations.

INVENTORY

- Mean: ₹770.37 - The average inventory amount.

• Standard Deviation: ₹153.26

• Median: ₹772.00 - The middle value, slightly above the mean.

• Kurtosis: -0.59 & Skewness: -0.13, the inventory data appears fairly symmetrical and lightly spread, with minimal extreme values.

• Range: ₹662.00 – It shows that inventory levels are consistent with limited fluctuations. Difference between the highest and lowest inventory values.

• Minimum: ₹416.00 - The lowest inventory value.

• Maximum: ₹1,078.00 - The highest inventory value.

• Sum: ₹70,104.00 - Total inventory over the period.

• Count: 91 - Number of inventory observations.

GENERAL INSIGHTS

- Sales data are somewhat evenly distributed, though there is positive skewness, meaning some larger sales values are influencing the mean.
- Purchase data shows extreme variability and outliers, as seen from its skewness and kurtosis values.
- Inventory data is fairly stable, with minimal variation compared to sales and purchases.

4) DETAILED EXPLANATION OF PROCESS/ANALYSIS

Over a period of three months, I collected, cleaned, organized, and analyzed data using Excel Sheets.

i) Data Cleaning and Organization:

- I carefully examined the data to confirm that its structure and format were suitable for effective analysis.
- This process involved identifying and correcting inconsistencies, filling in missing values, and addressing outliers that could impact the results.

ii) Descriptive Statistical Analysis:

- Applied various descriptive statistical techniques to summarize and explore the data.

- Key metrics, including mean, average, profit, and inventory levels, were computed to provide insights into the shop's insights.

iii) Data Visualization:

- I employed column, bar, line, and pie charts to visually illustrate revenue, SKU profitability, purchase prices, and their corresponding proportions.
- Clear Insights: These visualizations provided a straightforward and concise understanding of the performance and distribution of essential business metrics. They help identify trends, patterns, and areas of focus for decision-making.

iv) Pareto Chart for Revenue or Profit:

- Pareto Chart Visualization: Created a combined line and bar chart to present the Pareto analysis of revenue or profit for all SKUs.
- Detailed Breakdown: The bar chart displays individual revenue or profit values for each SKU, sorted in descending order, while the line chart overlays the cumulative percentage of revenue or profit.
- Insightful Representation: This combination provides a clear and effective visualization of the cumulative contribution of each SKU to the overall revenue or profit, highlighting the most significant contributors.

v) Pie Chart for Profit Proportions:

- I utilized a pie chart to display the profit proportions for different SKUs.
- Proportional Representation: The pie chart effectively represents each SKU's relative contribution to total profit by dividing the circular graph into sectors or slices.
- Insightful Comparison: Each slice corresponds to a specific SKU, with its size proportional to the profit generated by that SKU—larger slices indicating greater profit contributions.

vi) Line Chart for Trends:

- Trend Analysis with Line Chart: I used a line chart to display trends in revenue and purchasing prices over time.
- Strategic Insights: This chart visually represents how these variables change over time, helping to identify trends and inform strategic decision-making.

5) RESULTS AND FINDINGS

Here is the visualisation and data analysis on collected data-

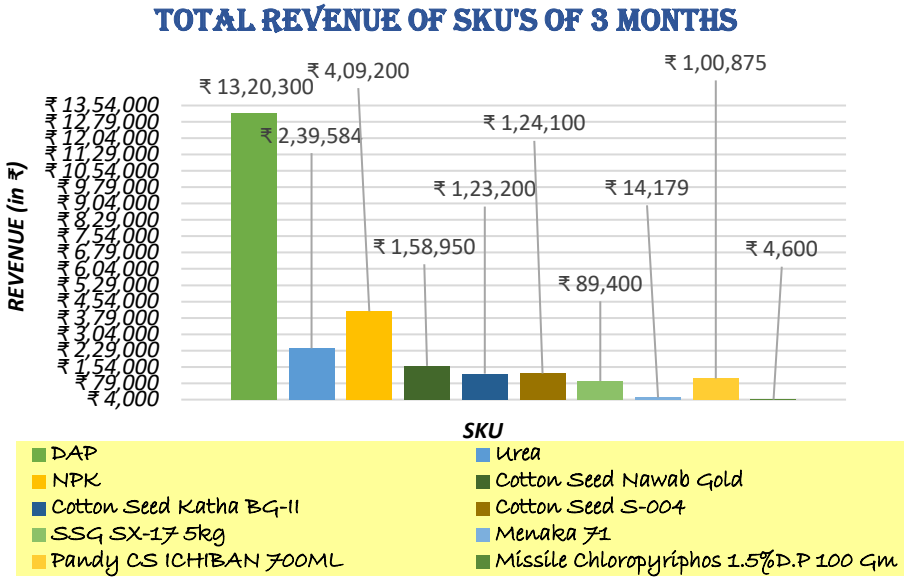


Chart 1: Total Revenue of all the SKU's over 3 months

- Top Revenue Generating Items: DAP, NPK, Urea are the highest revenue generators.
- Revenue Contributions: DAP contributed the most with ₹13,20,300, followed by NPK with ₹4,09,200, and Urea with ₹2,39,584.

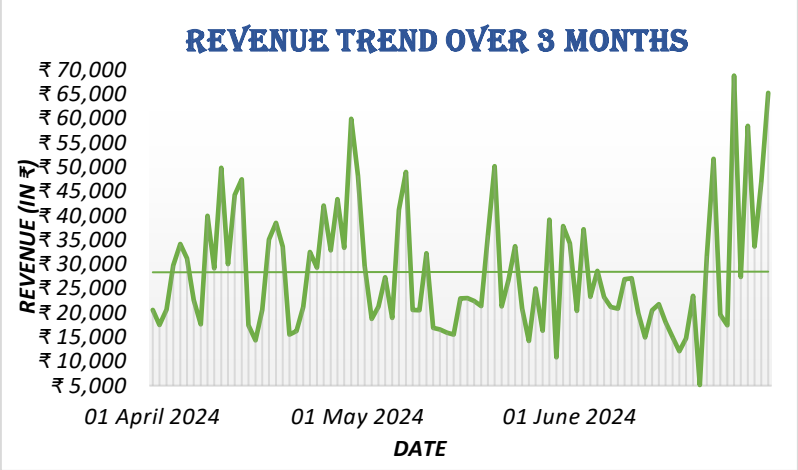


Chart 2: Total Revenue Trend observed over 3 months

• Daily Revenue Variation: The total daily revenue shows fluctuations, with a general upward trend towards the end of the period.

• Highest Revenue Day: The peak revenue day recorded a total of ₹ 68,822.

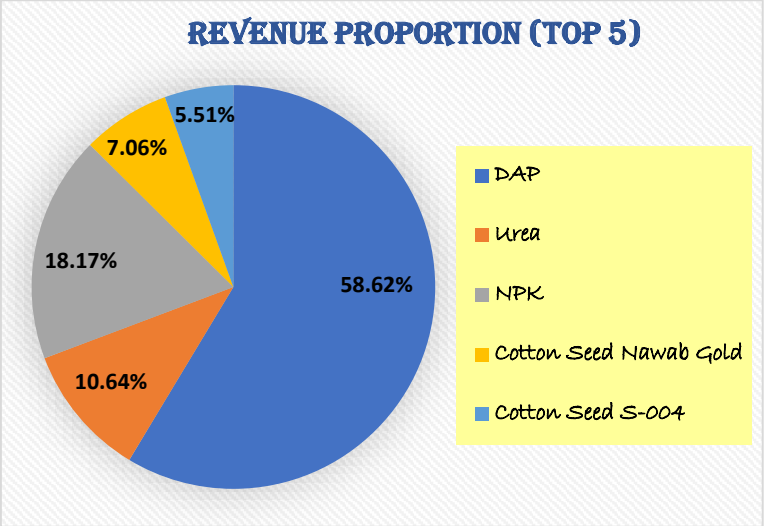


Chart 3: SKU's proportion to Total Revenue

• Major Contributors: DAP, NPK, and Urea together contribute a significant portion of the total revenue.

• Least Contribution: Cotton seed S-004 contributes the least to the total revenue.

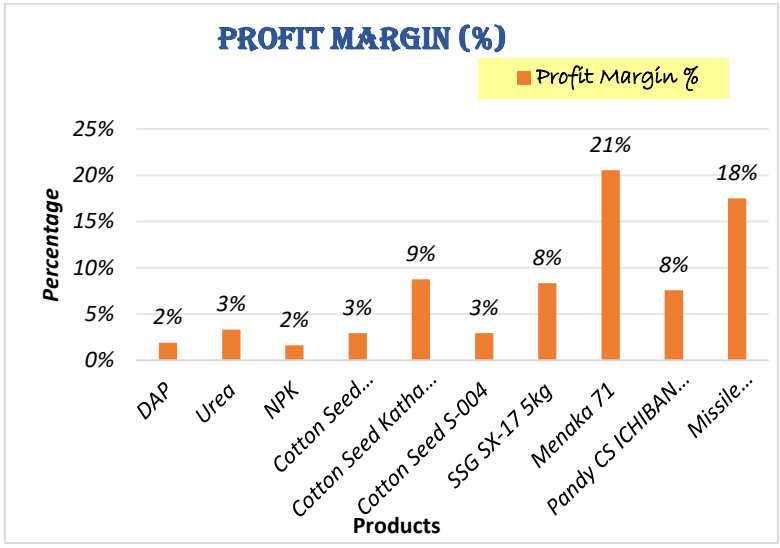


Chart 4: SKU's Profit Margin percentage

- High Margin Items: Menaka 71, Missile Chloropyriphos 15%DP 100 Gm, Cotton Seed Katha BG-II have high-profit margins.

- Low Margin Items: DAP, NPK and Urea have the lowest profit margins.

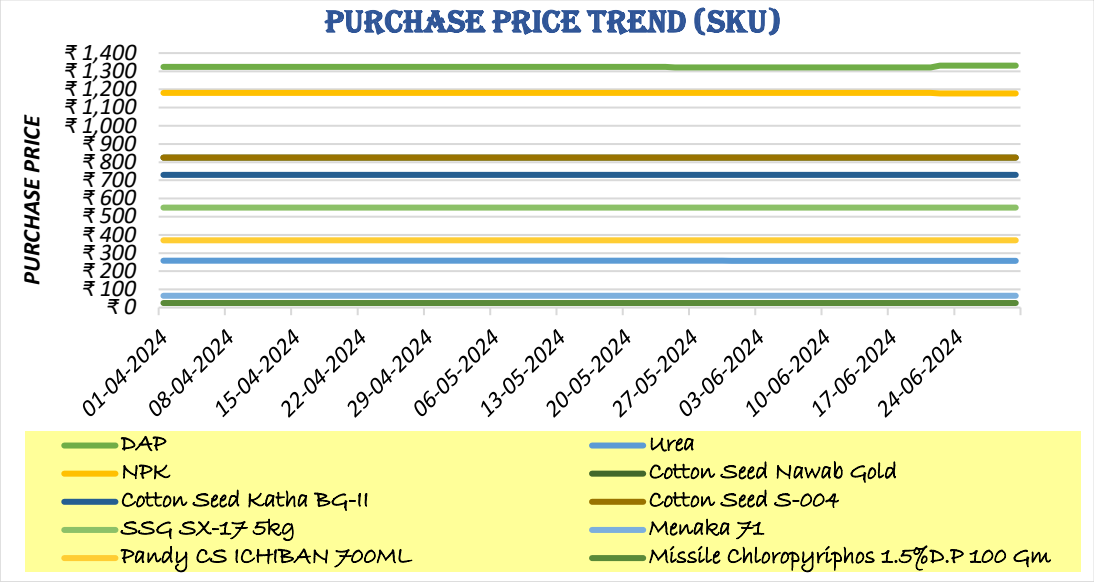


Chart 5: Purchase Price of all the SKU's over a period of 3 months (for shop owner)

• Price Stability: Items like Cotton Seed S-004, Menaka 71, Missile Chloropyriphos 15% DP 100gm, Pandy CS ICHIBAN 700ML, Cotton Seed Katha BG-II, SSG SX-17 5 kg, Cotton Seed Nawab Gold showed stable prices.

• Price Variations: Items such as Urea, NPK, DAP showed significant price fluctuations.

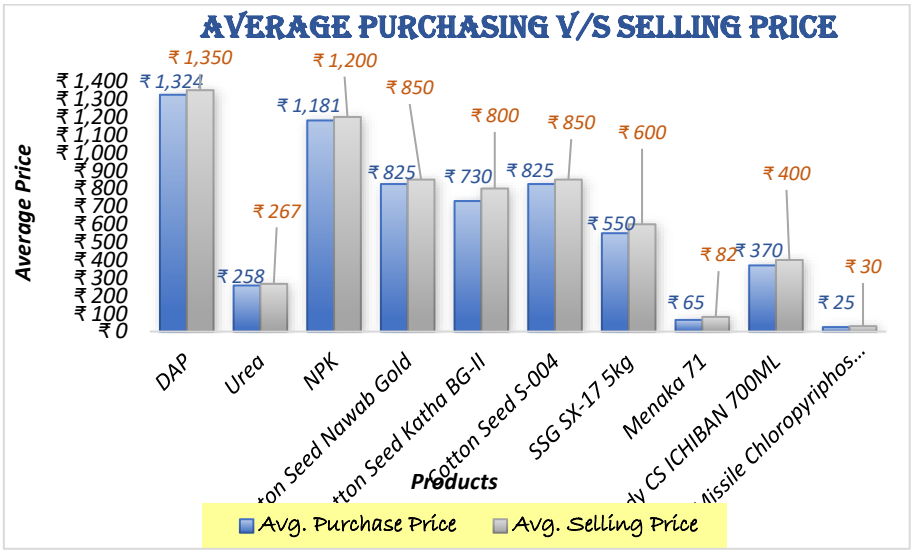


Chart 6: Avg. Purchase Price vs Avg. Selling Price

• Markups: Significant markups are seen in items like Cotton Seed Katha BG-II, SSG SX-17 5KG, Menaka 71, Pandy CS ICHIBAN 700ML.

• Competitive Pricing: Minimal price differences are observed in commodities like Urea, DAP, NPK, Cotton Seed Nawab Gold, Cotton Seed S-004, Missile Chloropyriphos 15%DP 100 Gm.

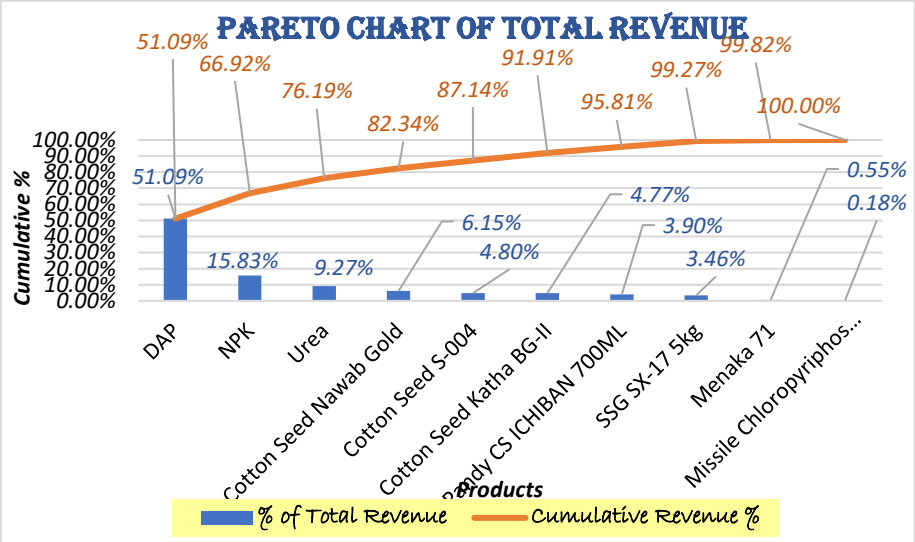


Chart 7: Pareto Chart of Total Revenue

• Key Revenue Drivers: The 3 SKUs (DAP, NPK, Urea) contribute to approximately 80% of the total revenue.

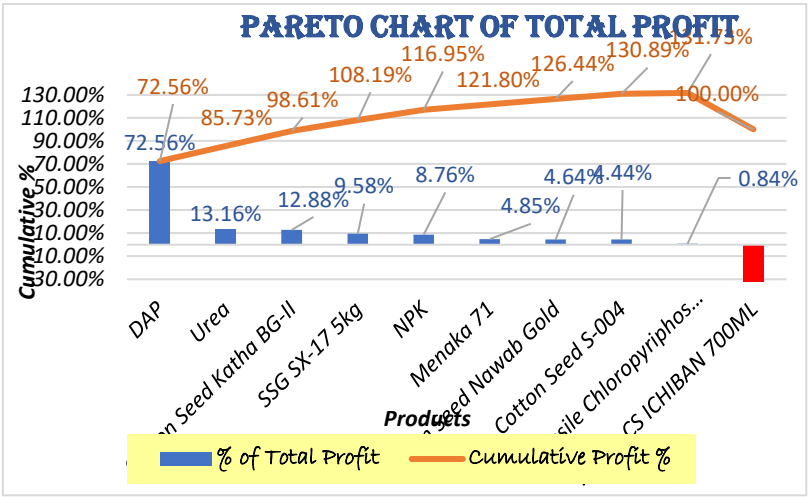


Chart 8: Pareto Chart of Total Profit

• Key Profit Drivers: Item such as DAP is the significant contributor to the total profit.