Optimizing Inventory Management of Sufal Bangla,Satlake

A Mid-Term report for the BDM capstone Project

Submitted by

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1 Executive Summary

Sufal Bangla, Saltlake is a vegetable vendor in Sector-3, Saltlake, Kolkata, that sells fresh, high-quality vegetables directly sourced from farmers. They focus on providing fresh produce to local customers, making sure that everything they sell is of the best quality. This dedication has made Sufal Bangla a trusted name in their area. Although they deal with almost all groceries, they have told us to analyze only the vegetables because that is their main focus.

Sufal Bangla faces several problems that affect their business. They often deal with a lot of waste because fresh vegetables spoil quickly, leading to significant financial losses. Additionally, they find it challenging to expand their business and secure the necessary funds for growth and development. On top of this, they face tough competition from online grocery services like Blinkit, which use advanced technology and data-driven strategies to attract more customers and manage their supplies more efficiently.

To tackle these issues, I analyzed various aspects of Sufal Bangla's operations. I examined the revenue generated by each type of vegetable, assessed their average shelf life, and compared the amount of waste to the profit each vegetable makes. This detailed analysis helped identify key areas for improvement, such as implementing better inventory management practices and developing strategies to reduce waste. These steps are aimed at boosting profits, ensuring sustainability, and helping Sufal Bangla grow and compete more effectively in the increasingly competitive market.

2 Proof of originality of the Data

- Business Name: Sufal Bangla,Saltlake
- Address: Municipality Main Rd, LB Block, Sector 3, Bidhannagar, Kolkata-700098, West Bengal.
- Video of interaction with the owner: Video Link
- Letter of Authorization: Letter Link

Fig 1.Shop Location and board

Fig 2.Shop Owner and his son (with whom I interacted)

Fig 3. Inside view of the shop

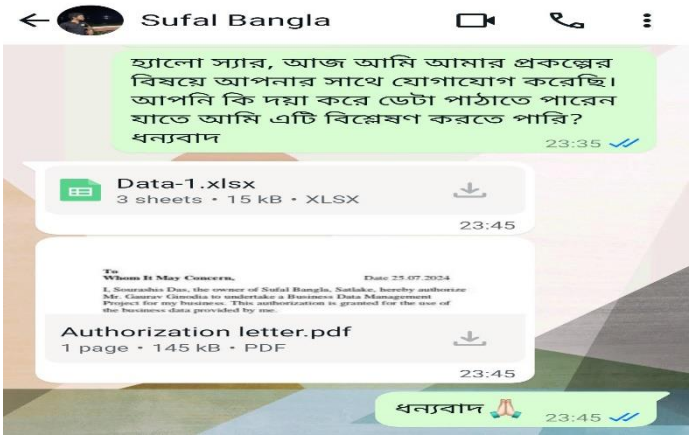


Fig 4. Chat with owner's son, providing the authorization letter

Fig 5. Front view of the shop

3 Metadata

- The data was provided in excel sheet
- Range of data is May,2024 to July,2024
- The excel sheet has three sheets- Sales Data,Purchase data,Monthly data

3.1 Sales Data

This sheet contains data related to the weekly sale of the vegetables.The features recorded in the sheet are-:

- Name of the Vegetable : The name of the vegetable sold.
- Unit-Unit in which the vegetable was sold-kilograms or pieces
- Average Rate(INR): The selling price for the vegetable(average of 3 months selling price)
- Sale of Week1-12: The quantity of that vegetable sold in the week ,starting from 1st week to 12th week
- Total Sales- Total sales of the vegetable after 12 weeks
- Total Revenue- The revenue generated by the vegetable in 3 months-(Total sales * Average rate)
- Weekly Revenue- Total revenue generated across a week from all the vegetables.

3.2 Monthly Data

This sheet contains data related to the monthly sale of the vegetables.The features recorded in the sheet are-:

- Name of the Vegetable-The name of the vegetable sold
- May Sales- The quantity of vegetables sold in the month of may
- June Sales-The quantity of vegetables sold in the month of June
- Total Sales during May-july- The total sales across the three months.

3.3 Purchase Data

This sheet contains data related to the total sale & purchase vegetables across three months.The features recorded in the sheet are-:

- Name of the Vegetable-The name of the vegetable
- Unit- The unit in which the vegetable was bought (kilograms/pieces)'
- Avg Selling Price(Rs)-The average of 3 months price at which the vegetable was sold to the consumer
- Total Sale-Total quantity of the vegetable sold across 3 months
- Avg Purchase Price(Rs)- The average of 3 months price at which the vegetable was bought by the owner.
- Total Purchase-Total quantity of the vegetable bought across 3 months

Link to the data-Data for BDM Project

4 Descriptive Statistics

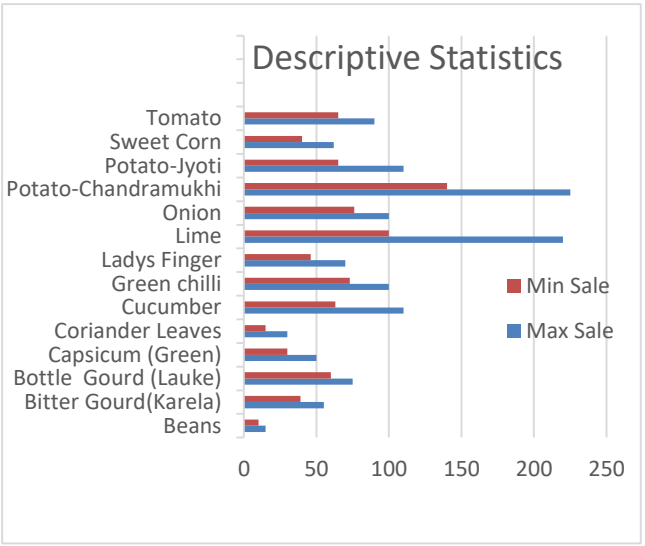
The dataset provided includes sales and revenue information for various vegetables over a 12-week period. The main variables are:

- **Name of the Item:** The type of vegetable.
- **Total Sale:** The total number of units sold.
- **Max Sale:** The highest number of units sold in a single week.
- **Min Sale:** The lowest number of units sold in a single week.
- **Revenue Generated:** The total revenue generated from the sales.
- **Profit:** The total profit earned from the sales.
- **Average Shelf Life (days):** The average number of days the vegetable can be stored before it spoils.
- **Weekly Sales and Revenue:** Sales and revenue data broken down by week.

Summary statistics for key variables:

- **Total Sale:**

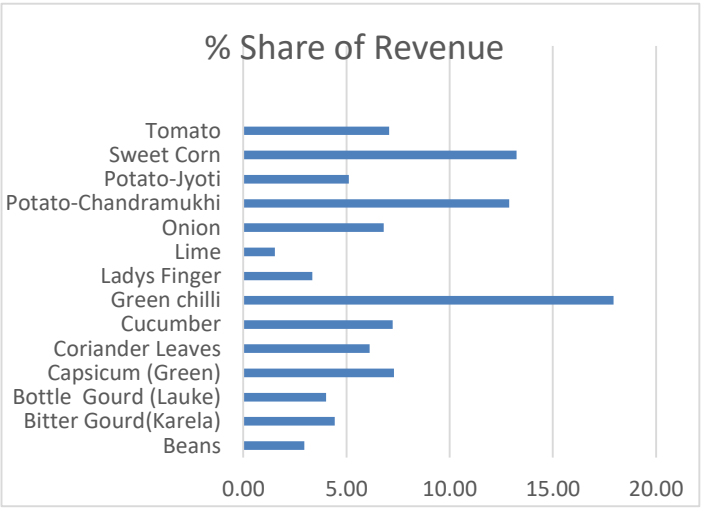
Statistics					
Name of the Item	Total Sale	Max Sale	Min Sale	Revenue Generated (Rate * Total sale)	Profit
Beans	144	15	10	17280	280
Bitter Gourd(Karela)	574	55	39	25830	7830
Bottle Gourd (Lauke)	835	75	60	23380	12580
Capsicum (Green)	448	50	30	42560	8810
Coriander Leaves	255	30	15	35700	7700
Cucumber	1,056	110	63	42240	7680
Green chilli	1,046	100	73	104600	31100
Ladys Finger	697	70	46	19516	7276
Lime	1,785	220	100	8925	3225
Onion	1,045	100	76	39710	6110
Potato-Chandramukhi	2,210	225	140	75140	18890
Potato-Jyoti	1,065	110	65	29820	8220
Sweet Corn	594	62	40	77220	23220
Tomato	915	90	65	41175	7925



- Average Sales in 3 months is 904.93 kgs
- Highest:Potato-Chandramukhi (2210 kgs)
- Lowest: Beans (144 kgs)

- **Revenue Generated:**

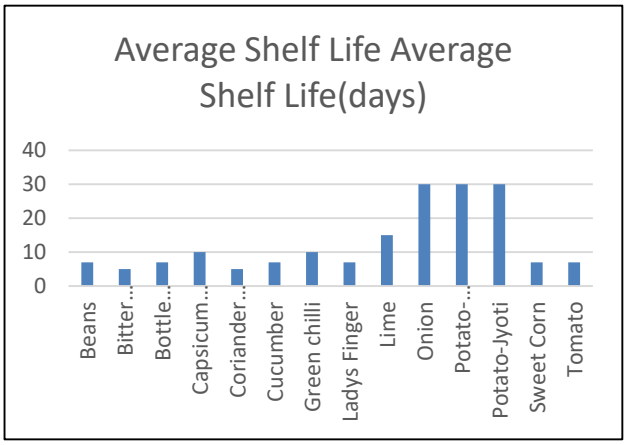
Revenue Pareto		
Name of the Item	Total Revenue	% Share of Revenue
Beans	17280	2.96
Bitter Gourd(Karela)	25830	4.43
Bottle Gourd (Lauke)	23380	4.01
Capsicum (Green)	42560	7.30
Coriander Leaves	35700	6.12
Cucumber	42240	7.24
Green chilli	104600	17.94
Ladys Finger	19516	3.35
Lime	8925	1.53
Onion	39710	6.81
Potato-Chandramukhi	75140	12.89
Potato-Jyoti	29820	5.11
Sweet Corn	77220	13.24
Tomato	41175	7.06



- Average Revenue generated: ₹41649.71(in 3 months)
- Highest: Green chili (₹104,600)
- Lowest: Lime (₹8925)

- **Average Shelf Life & Wastage Calculation:**

Wastage Calculation for Vegetables with Avg Shelf Life <= 7 days				
Name of the Item	Sale	Purchase	% Wastage	Contribution in Profit
Beans	144	200	28	0.19
Coriander Leaves	255	280	8.93	5.10
Bottle Gourd (Lauke)	835	900	7.22	8.34
Bitter Gourd(Karela)	574	600	4.33	5.84
Tomato	915	950	3.68	5.25
Ladys Finger	697	720	3.19	4.82
Sweet Corn	594	600	1	15.39



  - Longest shelf life: Onion, Potato-Chandramukhi, and Potato-Jyoti (30 days)
  - Shortest shelf life: Bitter Gourd & Coriander Leaves(5 days)

5 Detailed Explanation of Analysis Process/Method

Process:

1. **Data Collection:** Sales and revenue data were collected for each vegetable over a 12-week period.
2. **Descriptive Analysis:** Key statistics such as total sales, maximum and minimum weekly sales, total revenue, and profit were computed.
3. **Pareto Analysis:** Conducted to identify the vegetables contributing the most to total sales and revenue.
4. **Wastage Calculation:** Focused on vegetables with an average shelf life of 7 days or less to determine the percentage of wastage and its impact on profit.

Method Justification:

- **Descriptive Statistics:** Provides a clear summary of the data, highlighting key metrics such as sales, revenue, and profit. This method is essential for understanding the overall performance of each vegetable.
- **Pareto Analysis:** Helps in identifying the vital few vegetables that contribute the most to sales and revenue, allowing for more focused decision-making and resource allocation.

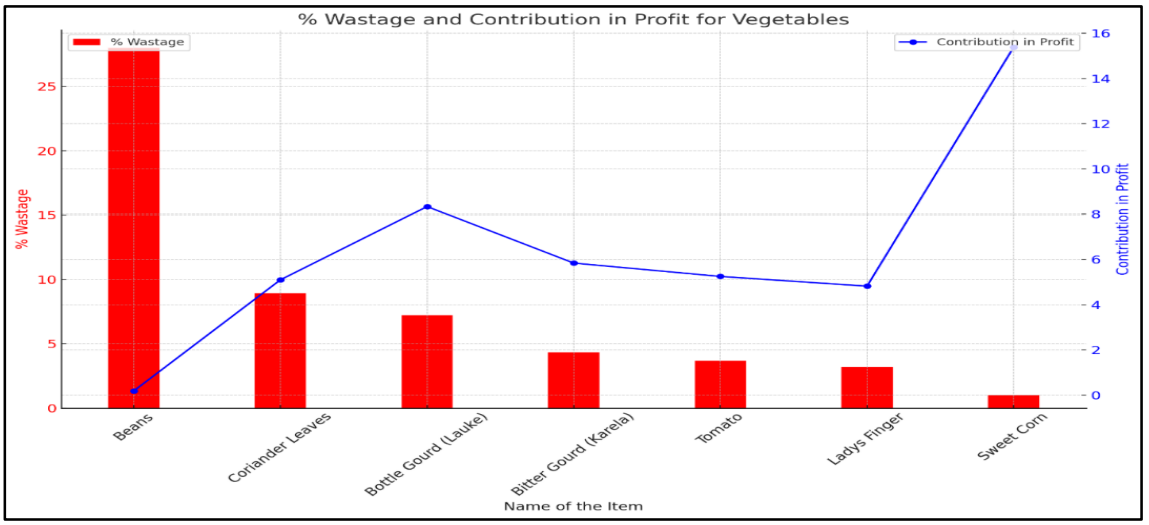
- **Wastage Calculation:** Crucial for managing perishable items. By understanding wastage patterns, steps can be taken to reduce losses and improve profitability.

Why This Method is More Appropriate:

- **Comprehensive Overview:** Descriptive statistics give a broad understanding of the data.
- **Focused Insights:** Pareto analysis directs attention to the most impactful items.
- **Actionable Information:** Wastage calculation provides practical insights for inventory and supply chain management.

6 Results and Findings

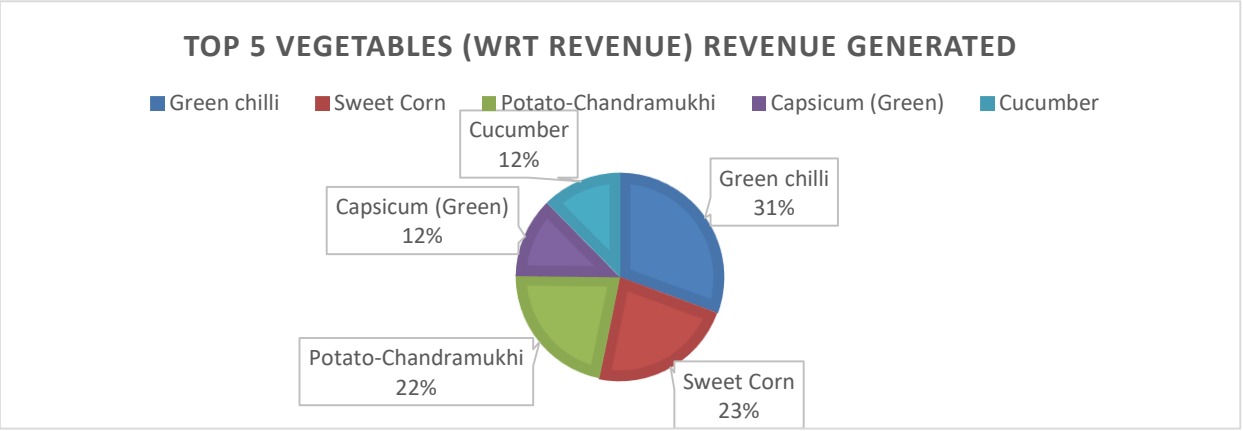
- **Wastage:** Beans with most wastage contributes lowest to the profits. Here's a dual-axis chart comparing the % Wastage and Contribution in Profit for vegetables with average shelf life less than or equal to 7 days.



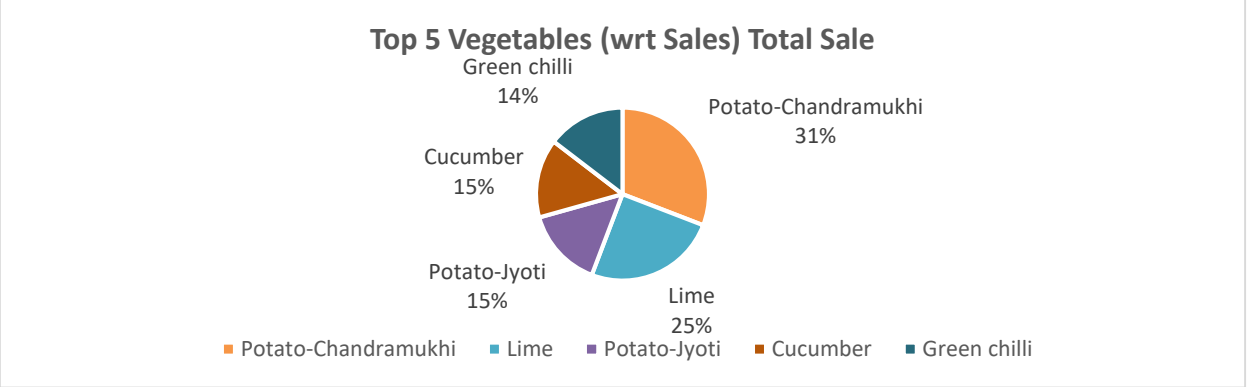
  - The red bars represent the % Wastage.
  - The blue line represents the Contribution in Profit.

This chart helps identify vegetables with high wastage and low contribution to profit, allowing the vendor to make informed decisions about which vegetables to stock less.

- **Top five Performers (Revenue):** Green chili, Sweet Corn, and Potato-Chandramukhi are the top three vegetables in terms of revenue generation.



- **Top five Performers (Sales):** Potato-Chandramukhi and Lime have the highest sales, indicating their popularity.



- **High Demand & Revenue Vegetables:** Green chili and Sweet Corn are both high in demand and relatively low in wastage, making them highly profitable.
- **High Sales but Low Revenue:** Vegetables like Lime and Potato-Jyoti have high sales numbers but generate less revenue, possibly due to lower pricing.