# Turning Data into Profit: Financial Strategies Thriving in the Vegetable Business

**An End-Term report for the BDM capstone Project**

Submitted by

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# 1. Executive Summary

## Introduction:

"Vishnu Kumar and Sons" is a growing vegetable business with 3-4 years of experience, located in Jarib Chowki, Kanpur, at a distance of 5 km from the nearest Sabzi Mandi. Competing among other local vendors, it operates on a B2C model, serving individual consumers and small vendors with fresh, high-quality produce. With a strong commitment to excellence, the shop ensures customer satisfaction by delivering top-quality vegetables daily. Operating from 7 AM to 9 PM, it remains a reliable choice for the local community.

## Challenges:

For project purposes, we are focusing on two major business challenges, one of which is the issue of **inventory management** at the vegetable shop, particularly overripe or unsold perishable produce. This excess inventory ties up capital, occupies valuable storage space, and increases wastage, making it difficult to introduce fresh stock. As a result, it directly impacts profitability and customer satisfaction, making it a critical area for improvement.

The second challenge is the shop's **stagnant profit growth**, with sales and revenue remaining consistent each month. Despite steady performance, the business struggles to capitalize on peak seasons or adapt to fluctuations in market demand, limiting opportunities for expansion. This lack of financial growth restricts investment in quality improvements, innovation, and competitive pricing strategies, ultimately impacting overall profitability and long-term sustainability

## Project Approach:

This project aims to provide actionable insights to overcome these challenges using data-driven analysis. Visual tools such as graphs, charts, and trend lines have been applied to present data and solutions with greater clarity.

The analysis revealed that the shop could significantly improve profitability by differentiating between fast-selling and slow-moving vegetables. Additionally, the business can stand out in a competitive market by introducing special discounts on certain days or offering bundled deals

on selected vegetables. Recommendations include refining sales strategies, optimizing inventory management, and adopting promotional techniques to attract more customers.

These insights are expected to help the shop overcome current challenges, expand its market reach, and boost profitability in the future. By adopting a more strategic approach, the business can ensure sustained growth and better positioning in the competitive vegetable market.

## 2. Detailed Explanation of Analysis Process/Method

### 1. Data Collection

Data was collected through interviews with the owner of "Vishnu Kumar and Sons" and various written records, such as the Khata-book and daily sales notepad. Key variables included different types of vegetables available, their cost price and selling price, the names of suppliers, and the specific produce they supply to the shop. Additionally, daily and weekly records were analysed, tracking the quantity of each vegetable sold per day, the stock purchased, and the unsold inventory left per day. This data provides valuable insights into sales patterns, demand fluctuations, and inventory management challenges.

### 2. Conversations

Engaging with the business owner provides valuable qualitative insights that cannot be captured through quantitative data alone. Understanding their perspective on challenges, customer preferences, and inventory management is crucial for deeper analysis. Additionally, I conducted regular visits to the shop and surrounding areas to assess the competitive landscape by mapping the number of vegetable vendors operating nearby. This helped in understanding market saturation, pricing strategies, and customer buying behaviour, providing key insights into the shop's position within the local market.

### 3. Data Digitization

All paper-based records, including transaction details, expenses, and daily sales, were digitized to create a structured and comprehensive dataset for detailed analysis. This transition

enabled better tracking of inventory, revenue trends, and wastage levels. To maintain data integrity, validation checks were implemented to minimize errors during entry, ensuring accuracy in financial and stock management.

## 4. Data Cleaning

The initial data was unstructured and handwritten, with challenges such as missing values, duplicate records, and unclear entries related to business operations. To ensure accuracy, the data was cleaned and structured using Excel tools and discussions with the shop owner. Sales and inventory data were organized on both a daily and weekly basis, making it easier to track stock levels, sales trends, and wastage, ultimately simplifying the information for better decision-making.

| Vegetable_Name | Cost_Price(₹) | Selling_Price(₹) | Quantity Bought(Kg) | Quantity Sold(Kg) | Profit(₹) | Date |
|---|---|---|---|---|---|---|
| Bottle Gourd (Lauki) | 20 | 30 | 20 | 15 | 150 | 01-09-2024 |
| Cabbage | 36 | 45 | 14 | 10 | 90 | 01-09-2024 |
| Cauliflower | 23 | 35 | 18 | 12 | 144 | 01-09-2024 |
| Ridge Gourd (Taroi) | 24 | 35 | 18 | 16.5 | 181.5 | 01-09-2024 |
| Carrot | 45 | 55 | 20 | 16 | 160 | 01-09-2024 |
| Peas (Frozen) | 105 | 115 | 20 | 10 | 100 | 01-09-2024 |
| Green Capsicum | 58 | 70 | 14 | 12.5 | 150 | 01-09-2024 |
| Pumpkin | 25 | 35 | 13 | 13 | 130 | 01-09-2024 |
| Tomatoes | 49 | 60 | 30 | 27.5 | 302.5 | 01-09-2024 |
| Potatoes | 25 | 35 | 50 | 30 | 300 | 01-09-2024 |
| Onion | 42 | 50 | 50 | 35 | 280 | 01-09-2024 |
| Green Chillies | 75 | 85 | 5 | 3.5 | 35 | 01-09-2024 |
| Coriander | 170 | 190 | 5 | 5 | 100 | 01-09-2024 |

*Fig 1. Daily Sales*

## 5. Descriptive Statistics

Descriptive statistics were used to summarize the vegetable shop's data, highlighting key metrics such as the average quantity purchased, total procurement cost, and best-selling vegetables. This analysis helped identify high and low-performing items, enabling better inventory and pricing decisions. The findings were visually represented using bar and pie charts, providing clear insights into sales trends, profit margins, and customer preferences, aiding in more informed business strategies.

## 6. Trend Analysis

Trend analysis for Vishnu Kumar and Sons, focuses on studying sales patterns to understand customer preferences and seasonal demand. By analysing trends, the business can stock high-

demand vegetables such as leafy greens and seasonal produce during peak periods, reducing waste and dead stock. This approach helps align inventory with market needs, ensuring better profitability and a competitive edge in the bustling local marketplace.

## 7. Visualization Tools

Google Sheets and Excel were extensively used to organize, clean, and analyse the vegetable shop's data. These tools helped create various graphs and perform essential calculations to extract valuable insights. Bar charts and pie charts were used to visualize the best- and worst-selling vegetables and customer preferences. Line graphs tracked inventory fluctuations**,** while stacked bar graphs allowed for better comparisons of sales trends. Additionally, trend lines and scatter plots helped analyze revenue progression and correlations between stock levels, demand, and profitability**,** aiding in smarter inventory and financial decisions.

## 8. Profit Analysis

Profit Margin: In the vegetable business, profit is the surplus amount remaining after deducting total procurement costs, shop rent, transportation, and other operational expenses from the revenue generated. This metric provides a clear insight into the shop’s financial health, measuring its ability to maintain profitability while managing daily expenses and fluctuating market prices.

## 9. ABC Analysis

ABC Analysis was utilized to categorize the vegetable shop’s inventory based on its value and impact on overall profit generation. Data was extracted from the shop’s purchase and sales records, and vegetables were classified into three categories:

- Category A: High-value vegetables that contribute 70-80% of the total revenue but make up only 10-20% of the total stock (e.g., exotic or premium vegetables like broccoli, mushrooms, and avocados).

- Category B: Moderately priced vegetables that account for 15-20% of the revenue and 30-40% of the inventory (e.g., capsicum, cauliflower, and ginger).
- Category C: Low-cost, high-volume vegetables that contribute only 5-10% of the revenue but make up a significant portion (40-50%) of the total inventory (e.g., potatoes, onions, tomatoes, and leafy greens).

By employing this methodical approach, the business gains valuable insights into financial performance, identifies areas for improvement, and makes data-driven decisions to boost profitability and efficiency. This analysis lays the groundwork for optimizing pricing strategies, refining sales approaches on high-demand days, and strengthening the link between inventory management and sales trends. Ultimately, it helps drive sustainable growth and maintain a competitive edge in the market.

## 10. Conclusion of Analysis Process

The analysis of Vishnu Kumar and Sons, a vegetable shop in Jarib Chowki, Kanpur, provided valuable insights into its inventory management, sales trends, and financial performance. By leveraging data-driven techniques, we identified critical challenges and opportunities for improvement in the business operations.

***Key Findings & Insights***

1. Inventory Challenges & Dead Stock Management
    - The shop struggles with excess unsold perishable stock, leading to financial losses and storage inefficiencies.
    - ABC analysis revealed that high-value vegetables (Category A) require precise demand forecasting, while low-value, high-volume vegetables (Category C) need better bulk purchase management to minimize waste.
2. Stagnant Profit Growth
    - Despite consistent sales, revenue remains stagnant due to lack of dynamic pricing, missed opportunities during peak seasons, and inadequate adaptation to market shifts.

- Seasonal demand fluctuations highlight the need for optimized inventory stocking and promotional offers to maximize profits.

3. Data Digitization & Trend Analysis
    - Transitioning from handwritten records to digitized data improved accuracy and organization of financial tracking.
    - Trend analysis helped identify high-demand vegetables, peak selling times, and slow-moving stock, enabling better stock planning.
    - Descriptive statistics and visual tools (bar charts, pie charts, and line graphs) made it easier to track profit margins, sales variations, and customer preferences.
4. Competitive Market Assessment
    - Regular market observations helped analyse local vendor competition, pricing strategies, and product variety, giving insights into customer buying behaviour.
    - Mapping nearby vegetable shops provided a better understanding of market saturation and positioning strategies.
5. Optimizing Pricing & Sales Strategy
    - Trend lines and scatter plots showcased a correlation between seasonal demand and income progression, emphasizing the need for adaptive pricing strategies.
    - Implementing weekly and daily performance tracking ensures better decision-making regarding discounts, promotions, and supplier negotiations.

# 3. Results and Findings

## Introduction

This section presents key insights derived from the data analysis conducted on Vishnu Kumar and Sons, a vegetable shop. Utilizing various analytical techniques such as bar charts, pie charts, line graphs, and comparative graphs, the findings provide a comprehensive overview of sales performance, inventory turnover, profit margins, and demand fluctuations. The results highlight critical trends and opportunities for growth, offering actionable insights to help the owner optimize inventory management, refine pricing strategies, and enhance overall profitability.

### Best Selling Items

To develop effective solutions for the identified business challenges, the first and most fundamental step is to analyse which vegetables are the best-selling and which are underperforming. Understanding sales trends will provide valuable insights into inventory management, demand forecasting, and profitability optimization, helping Vishnu Kumar and Sons make informed decisions to enhance overall business performance.

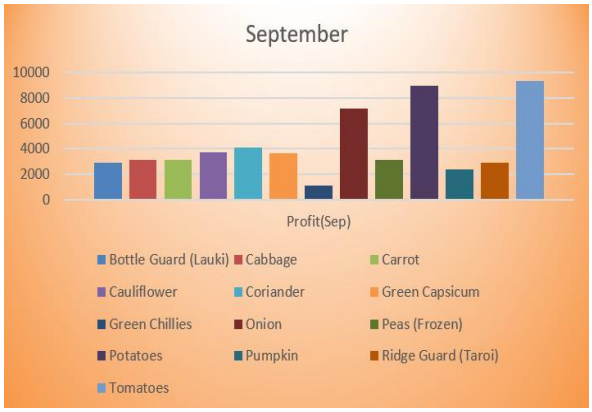


*Fig 2. Profit in September*

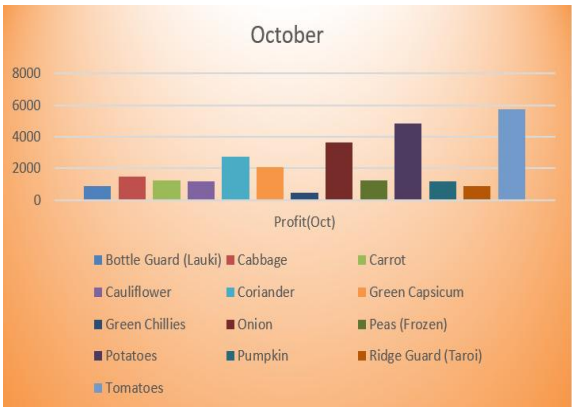


*Fig 3. Profit in October*

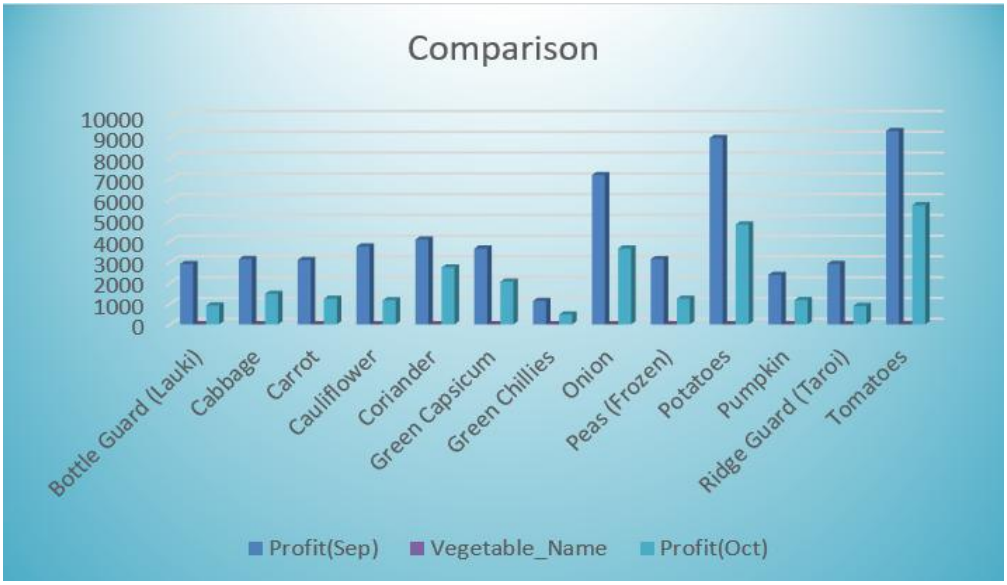


*Fig 4. Comparison of profits in both months*

The profitability analysis of different vegetables reveals key insights into sales performance and customer preferences. The table above shows the total profit earned from each vegetable, helping us determine which items are driving revenue and which may need strategic adjustments.

The above analysis shows:

**Top-Performing Vegetables:**

- **Tomatoes (₹15,047.5)** lead with the highest total profit, indicating strong and consistent demand.
- **Potatoes (₹13,785)** are the second-best performer, suggesting they are a staple purchase for customers.
- **Onions (₹10,839)** rank third, reinforcing their importance as an essential kitchen ingredient.
- **Coriander (₹6,826.25) and Green Capsicum (₹5,707)** also perform well, showing they are in demand despite being higher-priced compared to staple vegetables.

**Moderate Sellers:**

- **Cauliflower (₹4,913), Carrot (₹4,334), Peas (Frozen) (₹4,375), and Cabbage (₹4,616.75)** have moderate profitability. These items are not top sellers but still contribute significantly to revenue.
- **Ridge Gourd (₹3,799.75) and Bottle Gourd (₹3,814.25)** show stable sales but may require additional demand generation efforts to improve profitability.

**Low-Performing Vegetables:**

- **Green Chillies (₹1,604)** and **Pumpkin (₹3,554)** show relatively low profit margins, suggesting either lower demand or ineffective pricing.
- Their limited sales indicate the need for promotional efforts, bundle pricing, or potential reconsideration of stocking large quantities.

**Trend Analysis on Weekly Profit Data**

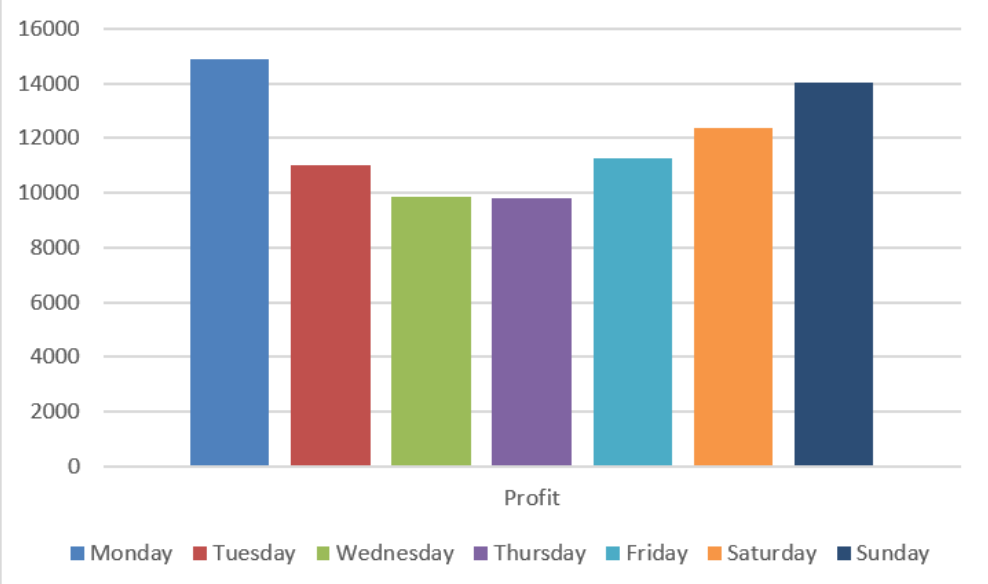


*Fig 5. Weekly Profit Data*

**Overview of Profit Trends**

The table provides daily profit values for a week, allowing us to identify patterns and trends in the business performance. By analysing the profit distribution across the weeks, we can determine the most and least profitable days, assess fluctuations, and derive insights for optimizing operations.


*Fig 6. Weekly Profit Trends*

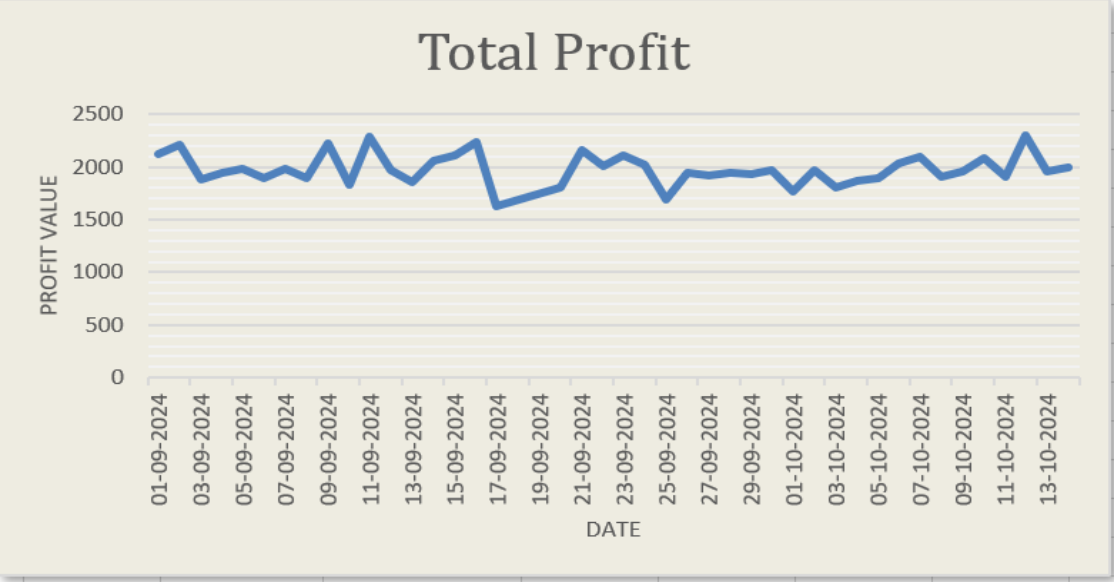


*Fig 7 Daily Profit*

**Key Observations**

1. **Highest Profit Days:**
    - **Monday (₹14,868)** and **Sunday (₹14,059)** record the highest profits, suggesting that these days experience high customer footfall.
    - This could be due to weekend shopping trends where people stock up on vegetables for the upcoming week.
2. **Lowest Profit Days:**

- **Wednesday (₹9,852)** and **Thursday (₹9,801)** have the lowest profits, indicating a mid-week dip in sales.
- This trend could suggest reduced customer visits or demand fluctuations during these days.

3. **Gradual Mid-Week Decline:**
    - Profits start high on Monday but decrease significantly by Wednesday and Thursday.
    - A slow recovery is observed on **Friday (₹11,250)** and **Saturday (₹12,354)** before peaking again on Sunday.
4. **Weekend Surge in Sales:**
    - Profits on **Saturday and Sunday are relatively high**, indicating that weekends are strong business days.
    - Customers may be purchasing more in preparation for the week ahead.

This analysis highlights the importance of leveraging peak sales days (Monday and Sunday) while implementing strategies to boost mid-week sales.

After discussing the sales patterns with the vegetable shop owner, it was discovered that the spike in sales on Mondays could be that many customers prefer to restock fresh vegetables after the weekend. Since weekends are typically when families consume more groceries due to gatherings, home-cooked meals, and special occasions, households often run low on essential vegetables by Monday. As a result, they visit the shop to replenish their weekly stock, leading to a surge in sales at the beginning of the week.

Similarly, the rise in sales on Sundays is due to the increased demand for fresh vegetables as customers prepare for the upcoming week. Many households prefer to stock up on essentials, contributing to higher sales figures.

However, the noticeable dip in sales from Tuesday to Thursday suggests a period of reduced customer engagement. This presents an opportunity to introduce targeted promotions, such as mid-week discounts, bundle offers, or home delivery services, to stimulate demand. Additionally, collaborating with local restaurants or catering businesses during these slower days can help maintain steady sales and reduce perishable stock wastage.

By strategically optimizing these insights, the vegetable shop can enhance revenue streams and improve overall profitability.

## Inventory Management Analysis of a Vegetable Shop

During my two-month analysis of the inventory management practices at the vegetable shop, several key insights emerged that highlight both strengths and areas for improvement.

### 1. Inventory Replenishment Cycle:

The vegetable inventory is replenished frequently due to the perishable nature of the products. Most vegetables need to be restocked daily or every two days to maintain freshness and meet customer demand. Over the course of my study, I observed that restocking occurs at least five to six times a week, ensuring a continuous supply of fresh produce. However, some longer shelf-life vegetables (such as potatoes, onions, and pumpkins) are replenished weekly.

### 2. Customer Preferences Drive Inventory Choices:

A strong correlation between customer demand and inventory stocking was observed. Certain vegetables, such as potatoes, onions, tomatoes, and green chilies, are purchased in larger quantities due to their frequent use in household cooking. These high-demand vegetables contribute significantly to overall sales and revenue.

Additionally, seasonal trends influence inventory decisions. For example:

- Green capsicum and cauliflower see higher demand in the winter months.
- Coriander and green chilies are staple items that customers purchase regularly.

To maximize sales, the shop ensures these high-performing vegetables are consistently available in fresh stock.

### 3. Inefficient Stocking of Low-Performing Items:

Despite focusing on high-demand products, inefficiencies in inventory management were also identified. Some vegetables experience high wastage levels, leading to financial losses.

For instance, data shows that:

- Bottle gourd (Lauki) and Ridge gourd (Taroi) have the highest wastage due to their shorter shelf life and lower demand.
- Onions and green capsicum also show considerable waste, possibly due to overstocking beyond customer demand.
- Perishable items like coriander and green chilies require precise demand estimation, as they spoil quickly if not sold within a few days.

The continued purchase of high-waste vegetables despite low sales performance highlights an inventory management issue. Overstocking of low-performing vegetables ties up capital and increases losses due to spoilage.

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**Conclusion:**

While the vegetable shop successfully manages high-demand products, there is room for improvement in inventory stocking strategies for perishable and slow-moving items.

To optimize inventory and reduce wastage, implementing a data-driven approach like ABC analysis can be highly beneficial.


*Fig 8. Total waste trend*

## ABC Classification for a Vegetable Shop

**Category A: High-Value, High-Demand Items**

These vegetables contribute significantly to total revenue and are sold frequently. They require close monitoring and frequent restocking to ensure availability.

**Examples:**

- **Tomatoes (₹15,047.5 in profit)** – One of the top-selling vegetables, contributing the most to sales.
- **Potatoes (₹13,785 in profit)** – A staple vegetable with consistent demand throughout the year.
- **Onions (₹10,839 in profit)** – Essential in daily cooking, showing high sales volume.
- **Coriander (₹6,826.25 in profit)** – A high-margin herb, frequently purchased in small quantities.

**Strategy for Category A:**

- Maintain sufficient stock to prevent shortages.
- Ensure high quality and freshness to retain customer satisfaction.
- Conduct daily inventory checks to avoid stockouts.
- Leverage bulk purchasing strategies to reduce procurement costs.

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**Category B: Moderate-Value, Medium-Demand Items**

These vegetables contribute moderately to revenue but do not require as much inventory attention as Category A.

**Examples:**

- **Green Capsicum (₹5,707 in profit)** – Moderate sales volume, mainly used in specific dishes.
- **Cauliflower (₹4,913 in profit)** – Seasonal vegetable with fluctuating demand.
- **Carrot (₹4,334 in profit)** – Purchased consistently but not as frequently as Category A items.
- **Peas (Frozen) (₹4,375 in profit)** – Moderate sales, more demand in specific seasons.

**Strategy for Category B:**

- Maintain moderate stock levels to balance demand and prevent excess waste.
- Monitor seasonal trends and adjust stock accordingly.
- Offer occasional discounts to encourage sales growth.

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**Category C: Low-Value, Low-Demand Items**

These vegetables contribute the least to overall revenue and may experience slow-moving sales. Poor inventory management of Category C items can lead to dead stock and wastage.

**Examples:**

- **Green Chillies (₹1,604 in profit)** – Sold in small quantities, often with long shelf life.
- **Pumpkin (₹3,554 in profit)** – Less frequently purchased, contributing minimally to sales.
- **Ridge Gourd (₹3,799.75 in profit)** – Moderate demand but does not contribute significantly to revenue.
- **Bottle Gourd (₹3,814.25 in profit)** – Though commonly used, its profit margin is relatively low.

**Strategy for Category C:**

- Limit stocking of these items to avoid spoilage and waste.
- Monitor customer demand trends and adjust purchase frequency.
- Consider seasonal discounts or combo offers to increase sales.

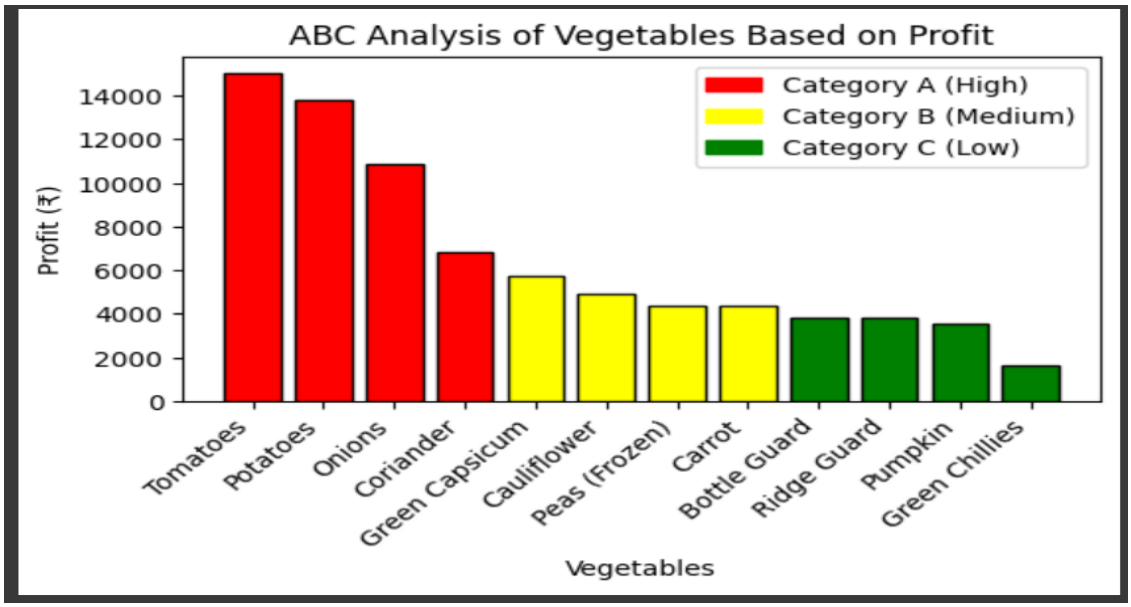


*Fig 9. ABC Analysis*

**Some additional Graphs for better understanding –**

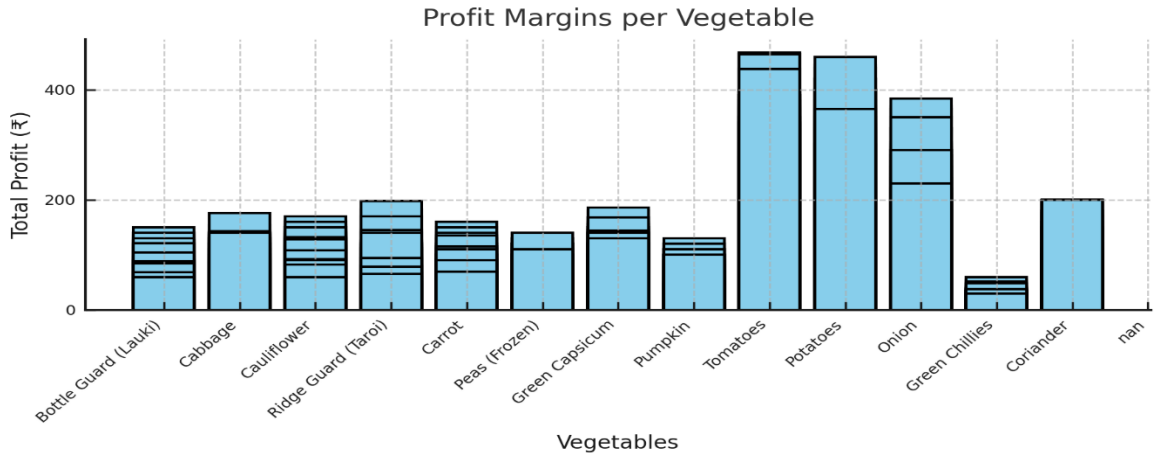


*Fig 10. Profit Margin*

The Profit Margins Bar Chart compares the total profit earned from each vegetable. Vegetables like Tomatoes, Potatoes, and Onions generate the highest profits, indicating their strong demand. On the other hand, items like Pumpkin and Green Chillies contribute less to overall revenue. This insight helps in prioritizing high-profit vegetables and optimizing inventory for low-performing ones to minimize waste.

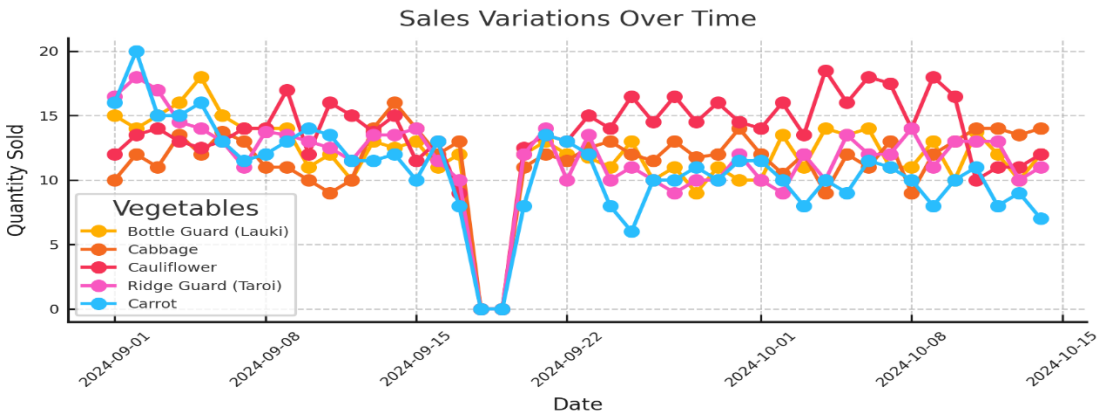


*Fig 11. Sales Variations*

The Sales Variations Line Graph tracks the quantity sold for different vegetables over time. It reveals fluctuations in sales, with peak demand occurring on Mondays and Sundays, while mid-week days show a decline. This trend suggests the need for discounts or promotional offers during low-sales periods to balance revenue. Seasonal changes also impact demand, requiring adaptive stocking strategies to reduce waste and maximize sales.

# 4. Interpretation of Results and Recommendations

## Recommendations to Increase Profit for the Vegetable Shop

1. Focus on High-Demand Vegetables:

- Increase visibility and stock of high-demand vegetables such as potatoes, onions, tomatoes, and green chilies, as they are essential for daily cooking.
- Offer pre-cut or pre-packaged vegetables (e.g., chopped onions, peeled garlic) for convenience, targeting busy customers.

2. Bundle Offers and Discounts:

- Create combo packs (e.g., "Curry Pack" with tomatoes, onions, green chilies, and coriander).
- Offer discounts on bulk purchases, encouraging customers to buy more at once.

3. Seasonal and Promotional Campaigns:

- Festival offers: Promote special vegetable combos during festivals like Navratri, Diwali, or Ramadan.
- Market Days Strategy: Focus on peak shopping days like Monday and Friday, offering buy 2kg, get 0.25kg free or discounts on bulk purchases.

4. Improve Store Layout and Presentation:

- Place fresh, vibrant vegetables at the front to attract customers.
- Keep low-waste and high-selling vegetables in easy-to-reach locations.

5. Leverage Customer Feedback and Local Opportunities:

- Students from coaching centres nearby: Introduce pre-packed vegetable packets (e.g., small packs of pre-cut vegetables) for easy cooking.
- Nearby societies: Use a vegetable cart to sell directly to residential areas, reaching more customers.
- Gather customer preferences to adjust stock and introduce seasonal or requested vegetables.

6. Accept Online Payments & Digital Orders:

- Introduce UPI payments (Google Pay, PhonePe, Paytm) for convenience.
- Provide customers with a phone number for placing direct orders.

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## Recommendations to Reduce Dead Stock

1. Implement ABC Analysis Regularly:

- Category A (High-Demand Items): Stock in large quantities (e.g., potatoes, onions, tomatoes).
- Category B (Moderate Demand): Stock in medium amounts based on seasonal demand (e.g., cauliflower, capsicum).
- Category C (Low-Demand, High-Waste Items): Reduce purchases of bottle gourd, ridge gourd, frozen peas, and other low-selling vegetables.

2. Offer Discounts on Perishable or Low-Selling Items:

- Bundle dead stock vegetables with high-selling ones (e.g., Buy 1kg tomatoes, get 250g bottle gourd free).
- Offer discounts on slow-moving vegetables before they spoil.

3. Data-Driven Purchasing Decisions:

- Track weekly sales and adjust stock quantities accordingly to avoid wastage.
- Maintain purchase records to determine which vegetables should be ordered less frequently.

4. Reduce Overstocking of Perishable Items:

- Store highly perishable vegetables (like coriander, green chilies, and spinach) in smaller quantities or pre-pack them for quick sales.

5. Return or Exchange Policy with Suppliers:

- Negotiate with vegetable wholesalers to return unsold stock or exchange it for fresh produce.

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## Additional Strategy: Expand Convenience Services

- Online Orders & Delivery: Encourage customers to order via WhatsApp or calls for home delivery.
- Vegetable Subscription Packs: Offer weekly vegetable baskets to society residents and coaching students.
- Introduce a Mobile Cart Service: Visit residential societies to sell fresh vegetables directly.

By implementing these strategies, the vegetable shop can increase profits, reduce wastage, and improve customer convenience, leading to a smoother and more profitable business.

# 5. Additional

Link: BDM PROJECT FOLDER