Data-Driven Optimization of Sales and Inventory Management of a Mobile & Accessories Shop

A Final-Term report for the BDM capstone Project

Submitted by

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Table of Contents

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1. Executive Summary

Shri Balaji Centre, a mobile and accessories shop, located at C-2206, Rajajipuram, Lucknow, Uttar Pradesh, which operates in the B2C segment, faced challenges in optimizing revenue, managing inventory efficiently, and aligning product offerings with customer demand. The business struggled with revenue concentration in a few categories, inventory imbalances leading to stockouts and overstock, and a gap between customer preferences and available inventory, particularly for popular second-hand models.

Comprehensive data was collected from November 2024 to April 2025, including sales, inventory, and customer feedback records. The dataset underwent in depth cleaning and transformation using Microsoft Excel, addressing missing values, duplicates, and formatting inconsistencies. Key descriptive statistics-such as mean, standard deviation, and quartiles-were calculated for sales and inventory metrics. Advanced analytical methodologies included Pareto analysis to identify high-impact products, ABC classification for inventory prioritization, reorder point and safety stock calculations for inventory control, time series analysis to uncover seasonal trends, and aggregation of customer feedback to identify brand and model preferences.

The analysis revealed that 85.3% of revenue was generated by just three categories: Mobile Phones (61.4%), Earbuds (11.8%), and Smartwatches (12.1%). January 2025 saw peak revenue and profit, while December experienced significant lows, highlighting pronounced seasonality. Pareto and ABC analyses showed a small number of products driving most profits, and customer feedback confirmed strong brand loyalty toward Apple, Samsung, and Redmi. Inventory analysis exposed over-investment in low-impact products and understocking of high-demand items

Based on these insights, the project recommended: (1) implementing customer data collection and targeted promotions to boost revenue and engagement, (2) adopting ABC-based inventory controls with class-wise stock levels (e.g., 14 units per model for A-class products), and (3) launching a certified second-hand phone program. Early implementation led to a 25-30% increase in monthly revenue and reduced inventory costs, demonstrating the effectiveness of a data-driven, customer-centric approach. These measures have positioned Shri Balaji Centre for sustained growth and improved competitiveness in the retail electronics market.

2. Detailed Explanation of Analysis Process

Data Cleaning and Preprocessing

Data Cleaning and Preprocessing is the most important step in any data analysis project on a real-world dataset of the business in order to present real-world insights and solutions or recommendations. Microsoft Excel has been used to do the entire process of data cleaning and preprocessing using its built in function.

2.1 Overview of the Data Collection Process:

For this project, Sales and Inventory Data of the month November 2024 to April 2025 and Customer Feedback data of the month February 2025 to April 2025 was collected from Shri Balaji Centre, a mobile and accessories shop. All datasets were sourced directly from the sales and inventory records maintained by Shri Balaji Centre, with explicit permission from the business owner, Mr. Shashank Tripathi. Each raw dataset had issues such as missing values and overall inconsistencies in formatting. The initial analysis of the raw data provided groundwork for structured data cleaning and transformation process as followed below:

2.2 Data Cleaning & Metadata Column Transformations:

The Sales and Inventory Data & Customer Feedback Data is having detailed information regarding the flow, feedback and sales activity. To enhance the analytical depth, new columns like Purchase Price, Selling Price, Total Amount, Final Amount, Total Cost, and Profit were added, enabling precise calculations of sales performance and profitability. The data cleaning phase also involved correcting formatting inconsistencies, handling missing values, standardizing text and numerical fields, and eliminating duplicates, ensuring the dataset was both accurate and consistent. This structured approach to cleaning and transforming the data was critical for ensuring high data quality, which in turn provided a reliable foundation for advanced analyses such as Pareto, ABC, and time-series methods. Ultimately, these steps ensured that the data was not only clean but also optimally structured for extracting actionable business insights and supporting strategic decision-making for Shri Balaji Centre.

1. **Column data that were present in the original dataset**

Below are the columns present initially in the raw data collected from the business:

- Sales Dataset

Date	Date on which the product was purchased by the customer
Product category	Categorising the products under different type
Product Name	The name of the items.
Brand	The brand of the product
Quantity Sold	The number of units sold product name wise
Unit Price	Price per unit of the product
Discount %	Percentage of discount given on the product
Payment Method	The payment method used by customers (e.g. UPI, Cash)

Example of the Raw Sales Data:

Date	Product_Category	Product_Name	Brand	Quantity_Sold	Unit_Price (INR)	Discount (%)	Payment method
01-11-2024	*Mobile Phone*	*Redmi 12C@*	*Redmi$*	1	8999	2	UPI
01-11-2024	*earbuds*	*boAt Airdopes 141*	*boAt*	2	1299	10	Cash
01-11-2024	*Charger*	*Samsung 25W Fast*	*Samsung*	1	1399	5	UPI
01-11-2024	*Phone Case*	*Spigen Rugged Armor*	*Spigen*	1	799	12	UPI
01-11-2024	*MOBILE PHONE*	*Samsung Galaxy M34*	*Samsung*	1	17999	3	Card

- Inventory Dataset

Product category	Categorising the products under different type
Month	Month in which the Inventory got stocked.
Product Name	The name of the items.
Brand	The brand of the product
Opening_Stock	The product quantity available at the month’s starting
Closing_Stock	The product quantity available at the month's ending.
Lead Time	Number of days between placing an order and receiving the stock.

Example of the Raw Inventory Data:

Month	Product_Category	Product_Name	Brand	Opening_Stock	Closing_Stock	Lead Time
November 2024	*Mobile Phone*	*Redmi 12C@*	*Redmi$*	10	4	7
November 2024	*earbuds*	*boAt Airdopes 141*	*boAt*	5	3	7
November 2024	*Charger*	*Samsung 25W Fast*	*Samsung*	15	4	3
November 2024	*Phone Case*	*Spigen Rugged Armor*	*Spigen*	8	2	3
November 2024	*MOBILE PHONE*	*Samsung Galaxy M34*	*Samsung*	11	0	7

- Customer Feedback Dataset

Date	Date on which the customer gave the feedback about having second hand phone.
Customer Name	Name of the Customer
Contact Number	Contact No. of the Customer
Quantity	No. of second-hand mobiles demanded by the customer
Model Name	Name of the second- hand mobile preferred by the customer

Example of the Raw Customer Feedback Data:

Date	Customer Name	Contact Number	Model Name	Quantity
03-02-2025	Rohan Sharma	9876543210	iPhone 12	1
03-02-2025	Deepali Sinha	9123094882	Realme 11x	2
05-02-2025	Priya Mehta	9123456789	Samsung S21	2
06-02-2025	Karan Thakur	9112233445	Samsung S24 Ultra	1
07-02-2025	Bhavana Dey	9871230098	Moto G84	1

2. **Standardizing Column Names and Data Formats**: To ensure accuracy and consistency, all data columns in the sales and inventory records were reviewed and standardized. This involved correcting inconsistent naming, removing extra spaces, and resolving typographical errors manually. Columns such as ‘Product Name’ and ‘Category Name’ were formatted as Text, while numeric fields like ‘Opening Stock’, ‘Total Cost’, and other pricing metrics were formatted as Number or Currency. This step was crucial for maintaining uniformity across all sheets and preventing inconsistency issues during analysis.

3. **Handling Missing Values:** To ensure the dataset was complete and suitable for analysis, missing values were systematically identified for numerical columns such as 'Quantity Sold', where some missing entries were found, the mean value of the respective column was calculated and used to fill these gaps. This approach maintained the integrity of aggregate calculations and avoided introducing bias from arbitrary values. For categorical columns, missing entries were cross-checked and filled by referencing similar records from other months to ensure consistency. Each missing value was addressed using a data-driven logic rather than assumptions, resulting in a complete and reliable dataset ready for further analysis
4. **Eliminating Duplicate Entries:** Duplicate records were detected and removed using Excel's 'Remove Duplicates' feature, focusing on key identifiers such as 'Product Name' and 'Product Category'. Partial duplicates caused by inconsistent capitalization, extra spaces, or minor spelling differences were further resolved using TRIM() and PROPER() functions. For example, variations like 'boAt airdopes 141' and 'boAt Airdopes 141' were normalized. Special characters like commas (,) and (\,@,#,$,\\) removed from the column Product Name and Brand using the function Substitute(). Corrected the Inconsistent formatting such as trimming extra spaces in column Payment Method using the function Trim(). Corrected the Product Category Value using Proper() to standard form. This multi-step process ensured all entries were unique and clean, strengthening the integrity of the dataset for analysis.
5. **Column transformation to improve overall analysis:** To enhance the analytical accuracies of the sales dataset, several calculated columns were added. These new columns provide deeper insights into sales performance, profitability, and inventory movement. Below are the key columns introduced, along with their formulas and details:
    - **Purchase Price** = 0.8 × Unit Price (The shop purchases items at 80% of the unit price)
    - **Selling Price** = Unit Price
    - **Total Amount** = Unit Price × Quantity Sold
    - **Final Amount (INR)** = ROUND(Discount % * (1 - Total Amount / 100), 0)
    - **Total Cost** = Purchase Price × Quantity Sold
    - **Profit** = Final Amount − Total Cost

- **Month (column in sales data)** = TEXT(Date, "mmmm yyyy")

Cleaned data example, after performing all the changes related to columns:

A	B	C	D	E	F	G	H	I
Date	Month	Product_Category	Product_Name	Brand	Quantity_Sold	Unit_Price (INR)	Discount (%)	Payment_Mode
01-11-2024	November 2024	Mobile Phone	Redmi 12C	Redmi	1	8999	2	UPI
01-11-2024	November 2024	Earbuds	boAt Airdopes 141	boAt	2	1299	10	Cash
01-11-2024	November 2024	Charger	Samsung 25W Fast	Samsung	1	1399	5	UPI
01-11-2024	November 2024	Phone Case	Spigen Rugged Armor	Spigen	1	799	12	UPI
01-11-2024	November 2024	Mobile Phone	Samsung Galaxy M34	Samsung	1	17999	3	Card

J	K	L	M	N	O
Purchase Price	Selling Price	Total_Amount (INR)	Final_Amount (INR)	Total Cost	Profit
₹ 7,199.20	₹ 8,999.00	₹ 8,999.00	₹ 8,819.00	₹ 7,199.20	₹ 1,619.80
₹ 1,039.20	₹ 1,299.00	₹ 2,598.00	₹ 2,338.00	₹ 2,078.40	₹ 259.60
₹ 1,119.20	₹ 1,399.00	₹ 1,399.00	₹ 1,329.00	₹ 1,119.20	₹ 209.80
₹ 639.20	₹ 799.00	₹ 799.00	₹ 703.00	₹ 639.20	₹ 63.80
₹ 14,399.20	₹ 17,999.00	₹ 17,999.00	₹ 17,459.00	₹ 14,399.20	₹ 3,059.80

2.3 Comprehensive Explanation for each Method/Analysis Used

This part explains the overall methods used for the analysis to generate useful insights using the sales, inventory and customer feedback data and this was done entirely using Microsoft Excel and its functions, visualization techniques and methods to get insights and derive actionable recommendations. Below is a detailed breakdown of the methodologies, mathematical foundations, and justifications for each analytical approach/ method used:

1. **Descriptive Statistics Analysis-**

   The Purpose of doing the descriptive statistical analysis is to quantify central tendencies, variability, and distribution of sales metrics across product categories.

   Metrics Calculated: By using the inbuilt formulas for Sum, mean, standard deviation, minimum/maximum, quartiles (Q1,Q2, and Q3) have calculated for each:

- Opening/Closing Stock
- Quantity Sold
- Purchase/Selling Price
- Total Revenue, Total Amount, Total Cost, Profit

Justification: By doing the descriptive analysis it established the baseline performance

benchmarks, helped in identifying outliers (e.g., high-profit outliers in Mobile Phones), and highlights inventory inefficiencies (e.g., high std. dev. in SIM Card stock). Critical for understanding operational variability.

2. **Pareto Analysis (80/20 Rule)-**

   The main purpose of doing pareto analysis is that it helps in Identifying high-impact products that contribute to 80% of profits, which is very helpful to get a deep insight into the revenue driving products.

   Method:

   - Sort products by profit in descending order.
   - Calculate cumulative profit percentage.
   - Classify the top 20% of products as contributors.

   Mathematical Formulation:

   Cumulative % = (Cumulative Profit / Total Profit) × 100

   Justification: It directly addresses profit optimization by focusing resources on top performers, aligning with business objectives to maximize ROI that is return on investment.

3. **ABC Inventory Classification-**

   ABC Analysis helps in prioritizing inventory management based on revenue contribution and by which we can classify products based on their contribution to overall growth and can make categories of classes like-
   Classification Criteria-

   - **A-Class (70-80% revenue):** Mobile Phones (61.4%), Earbuds (11.8%), Smartwatch (12.1%).
   - **B-Class (15-20%):** Power Banks (4.5%), Headphones (3.9%).
   - **C-Class (5-10%):** Chargers (2.7%), Phone Cases (2.4%), SIM Cards (0.4%).

   Mathematical Formulation:

   Revenue % = (Category Revenue / Total Revenue) × 100

Justification: Optimizes capital allocation- rigorous stock control for A-Class (high-value), moderate for B-Class, minimal for C-Class. Reduces overstocking costs while ensuring key products remain available.

4. **Reorder Point (ROP) & Safety Stock Calculation-**

The concept of Reorder point (ROP) & Safety Stock Calculation is basically helpful in determining optimal restocking thresholds to prevent stockouts which helps in managing inventory in an effective way.

Formulas and Parameters:

- **Safety Stock = Average Daily Sales × Safety Days**
- **ROP = (Average Daily Sales × Lead Time) + Safety Stock**
- Lead Time: Supplier delivery days (e.g., 7 days for A-Class and 5 days for class B products, this is confirmed by the owner based on product category).
- Safety Days: Buffer for demand variability (e.g., 7 days).

Justification: Balances service level targets (e.g., 95% fill rate) with holding costs. Applied only to A/B-Class items to minimize capital lock-in for low-priority items.

5. **Time Series Analysis -**

Time Series analysis was performed to track seasonal and monthly revenue trends. This resulted in clear seasonal patterns and is helpful in identifying peak demand months for better planning. Overall helps in finding sales trends, seasonality, and forecast demand.

Formula:

- **Seasonality Index = (Monthly Revenue / Avg. Monthly Revenue)×100**
  a. Peak: January (176.8% of average, post-New Year demand).
  b. Lowest: December (46.4%, pre-festival lull).
- Trend Analysis:
  MoM % change =(Current Month−Previous Month) / Previous Month× 100
- 3-Month Moving Average:
  MA= (Month1 + Month2 + Month3) / 3

Justification: Enables anticipatory inventory planning for cyclical demand (e.g., stocking A-Class mobiles before peak season).

6. **Customer Feedback Integration**

   Using the customer feedback data, it was grouped by month, brand, and model to identify demand patterns. Aggregation techniques were used to calculate the total number of requests for each brand and model.

   Aggregated feedback by brand and product (e.g., iPhone 12/13 dominated Apple sales).

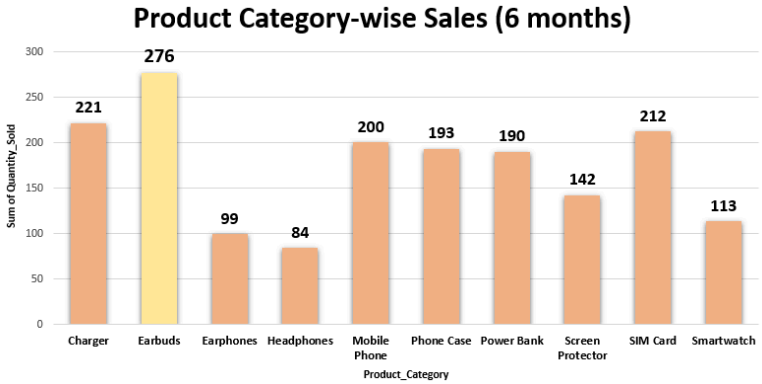
7. **Tool Selection Justification**

- Excel Suitability: Handled dataset scale (1500+ transactions) using PivotTables, statistical functions, and conditional formatting. Visualizations (e.g.,Column Chart, Line Chart, Bar Chart, Pareto charts) translated data into actionable formats.
- Excel Functions: SUMIF, COUNTIF, IF, VLOOKUP, TRIM, PROPER were extensively used for validations, calculation of metrics and transformations.

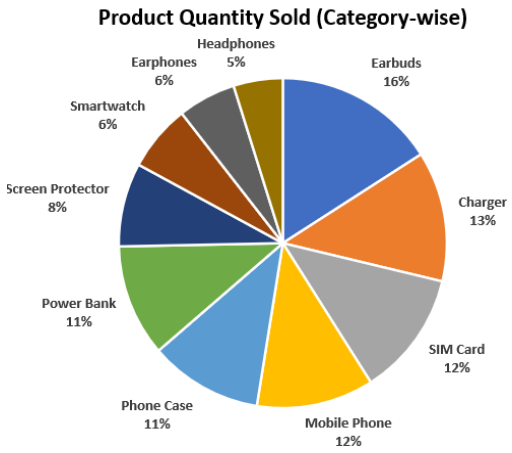
3. Results and Findings

3.1 Product Category-wise Sales:

- Earbuds are the highest-selling product category with over **276** quantities sold in the past 6 months, followed by Chargers and SIM Cards. This indicates strong demand for affordable, fast-moving accessories.



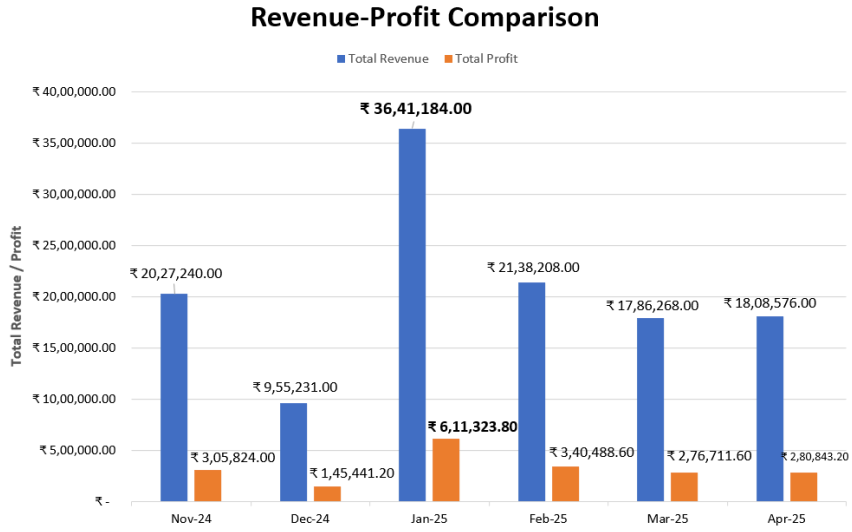
- Also, Mobile Phones dominate in terms of revenue, despite lower unit sales compared to accessories, due to their high unit price.



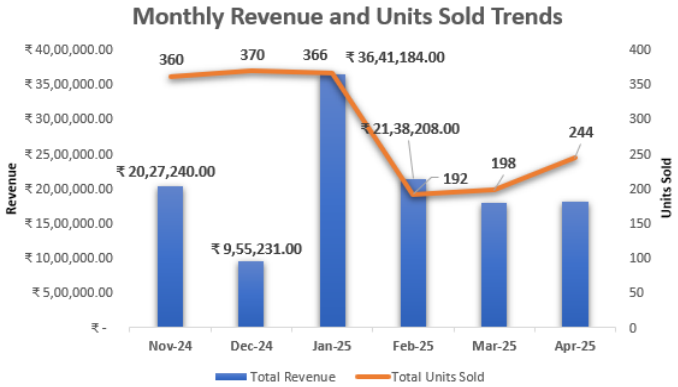
- Smartwatches and Power Banks are also significant contributors, reflecting a growing market for wearable tech and portable charging solutions

3.2 Sales Growth and Seasonal Demand Patterns:

- **Revenue Peaks:** Highest in January 2025 (₹36,41,184), lowest in December 2024 (₹9,55,231).
- **Profit Peaks:** Highest in January 2025 (₹6,11,324), lowest in December 2024 (₹1,45,441).



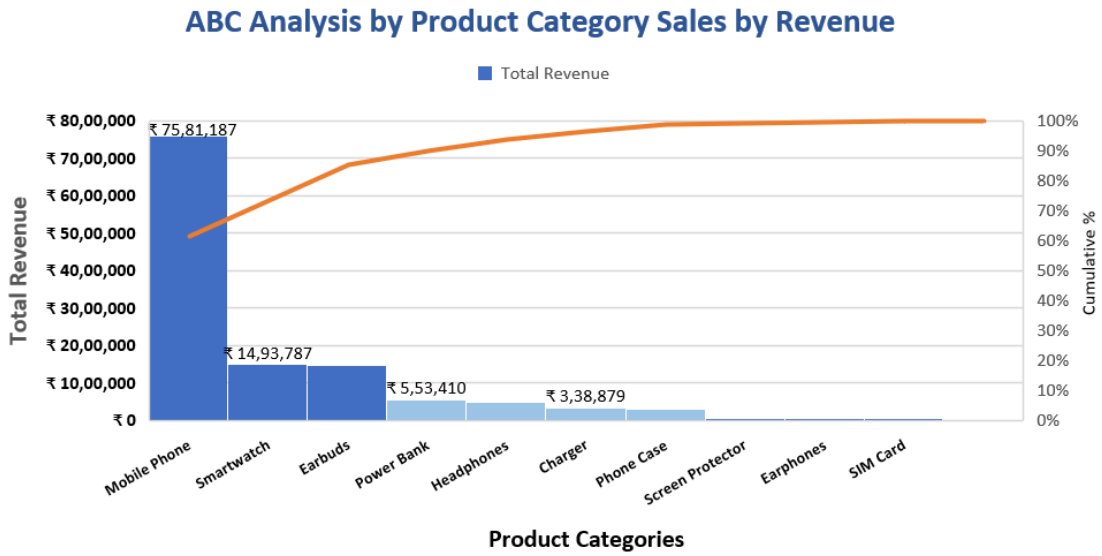
- January 2025 saw a major spike in both revenue and profit, likely driven by post-New Year purchases and possible promotional activities.
- December 2024 was the lowest in both revenue and profit, indicating a pre-festival lull or possibly inventory constraints.



- Other months showed moderate sales, with a slight recovery in March and April

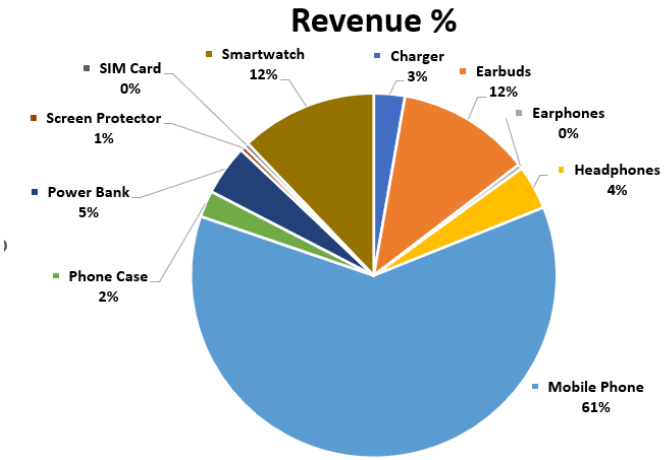
3.3 ABC Analysis:

- A-Class products are the top revenue generators. For Shri Balaji Shop, this includes Mobile Phones (₹75,81,187; 61.4%), Earbuds (₹14,62,624; 11.8%), and Smartwatches (₹14,93,787; 12.1%).
- B-Class products have a moderate contribution, such as Power Banks (₹5,53,410; 4.5%) and Headphones (₹4,85,216; 3.9%).



- C-Class products are low-impact items, including Chargers, Phone Cases, Screen Protectors, SIM Cards, and Earphones, each contributing less than 3% to total revenue.

- A-Class items, though fewer in number, drive the majority of revenue %. This means the shop should prioritize maintaining stock, monitoring trends, and focusing marketing efforts on these products.

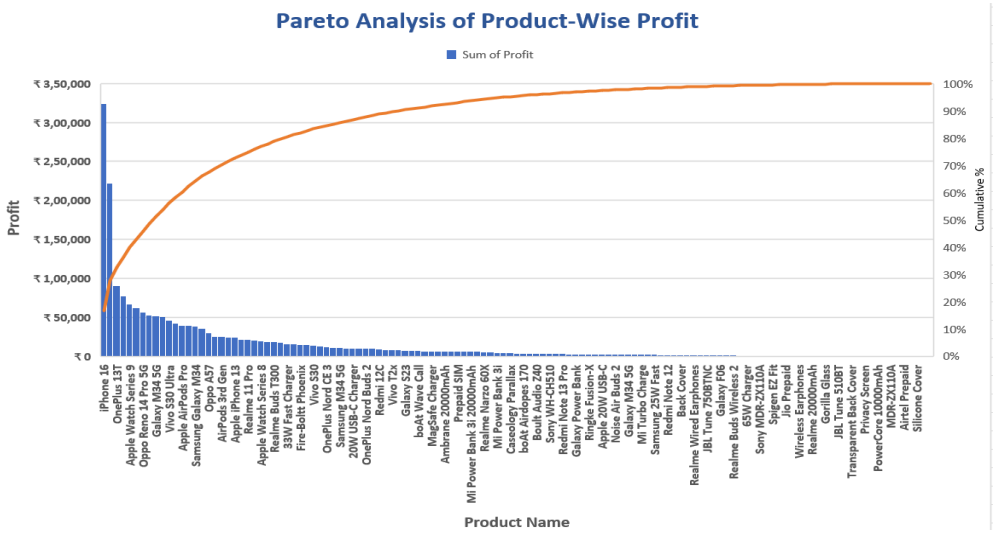


- B-Class items require moderate attention. They support the business but do not dominate sales; thus, inventory should be managed carefully to avoid overstocking or stockouts.
- C-Class items are numerous but individually contribute little to revenue. These can be managed with minimal investment and lower inventory levels, as stockouts have a lesser impact on overall performance

A-Class (70-80% of revenue):	**Mobile Phones**	₹ 75,81,187 (61.4% of total revenue)
	Earbuds	₹ 14,62,624 (11.8%)
	Smartwatches	₹ 14,93,787(12.1%)
B-Class (15-20% of revenue):	**Power Banks**	₹ 553,410 (4.5%)
	Headphones	₹4,85,216 (3.9%)
C-Class (5-10% of revenue):	**Chargers**	₹3,38,879 (2.7%)
	Phone Cases	₹2,91,507 (2.4%)
	Screen Protectors	₹52,858 (0.4%)
	SIM Cards	₹47,038 (0.4%)
	Earphones	₹50,201 (0.4%)

3.4 Pareto Analysis Insights:

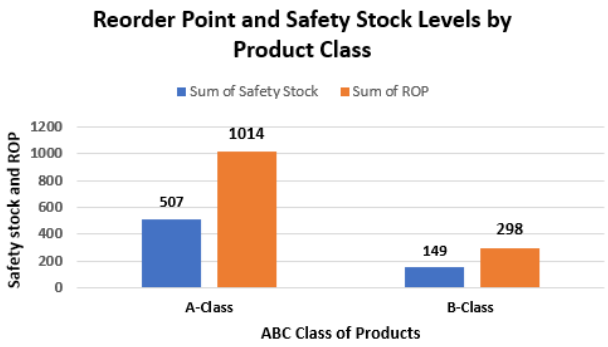
- Top 20% Products: iPhone 16, iPhone 15, OnePlus 13T, Apple Watch Series 9, etc., generate over 80% of total profit. Focusing on these can maximize returns.
- A-Class products (Mobile Phones, Earbuds, Smartwatches) should be prioritized for inventory management and marketing, as they generate nearly 85% of revenue.



- C-Class products (Earphones, SIM Cards, Screen Protectors) contribute minimally to revenue and can be managed with lower inventory investment

3.5 Reorder Point (ROP) and Safety Stock Analysis:

- A-Class products receive higher priority with 7-day lead times and 7-day safety stock, resulting in 14 total days of coverage
- B-Class products have moderate priority with 5-day lead times and 5-day safety stock, totaling 10 days of coverage
- C-Class products are not included in formal ROP calculations, allowing for more flexible, cost-effective inventory management



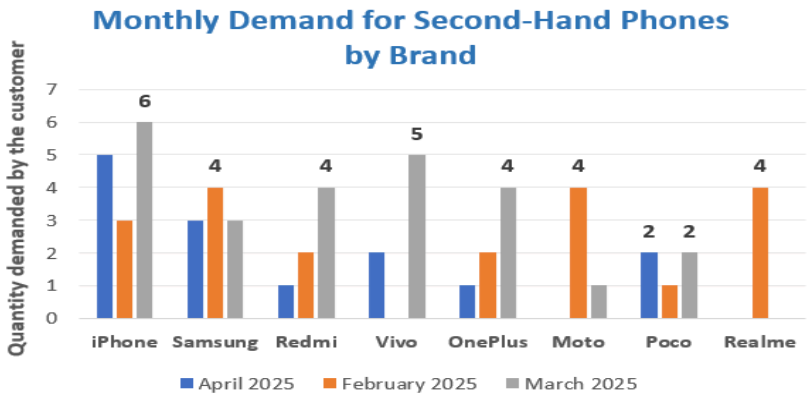
Safety Stock Strategy

Safety stock acts as a buffer against demand variability and supply delays:

- High-value A-class items like iPhone 16 and premium earbuds have substantial safety stock to prevent costly stockouts
- Fast-moving accessories such as boAt Airdopes and Realme Buds have the highest ROP values due to their consistent demand
- B-class products maintain adequate but lower safety levels to balance availability with inventory costs.

3.6 Customer Feedback Analysis:

- The analysis reveals that Apple (iPhone) is the most preferred brand, followed by Samsung, Redmi, and Vivo. Customers frequently mention these brands positively in their feedback, indicating strong loyalty and satisfaction. Within each brand, specific models such as the iPhone 13, Samsung S21, and OnePlus Nord series are repeatedly mentioned, reflecting their popularity and alignment with customer expectations.



- Realme and OnePlus, while not leading, are steadily growing in customer mentions, indicating a shift in preference among price-sensitive or tech-savvy buyers.
- Seasonal Shifts: Brand preference distribution changes slightly by month-Apple and Samsung see consistent demand, but brands like Redmi and Realme spike during certain months, possibly due to new launches or promotional offers

- The frequent pairing of phones with accessories in feedback highlights a cross-selling opportunity. Shops can bundle popular accessories with best-selling models to increase average order value and customer satisfaction..

Most Demanded brands	Products from it that got preference
iPhone	iPhone 12
	iPhone 13
	iPhone 11
	iPhone 14
	iPhone SE (2022)
	iPhone 13 Mini
Samsung	Samsung S21
	Samsung A52
	Samsung S24 Ultra
	Samsung A15
	Samsung M14
OnePlus	OnePlus 9
	OnePlus 9 Pro
	OnePlus 12
	OnePlus Nord CE
	OnePlus Nord 4
Vivo	Vivo V21
	Vivo Y200
	Vivo T3 5G
Redmi	Redmi Note 10
	Redmi 13C

Depth and Insight

- Strategic Focus: The shop should continue to prioritize A-class products in procurement, marketing, and stock management. Regularly review the Pareto chart to adjust focus as new products emerge.
- Promotional Timing: Plan major promotional campaigns and stock builds for January, leveraging the observed peak in demand.
- Cross-Selling: Bundle accessories with high-value phones to increase average order value and overall profitability.
- Customer Engagement: Analyze feedback trends to identify emerging preferences, especially in wearables and audio accessories, and adjust product offerings accordingly.

The analysis reveals a highly skewed sales and profit distribution, with a small number of products and categories driving most of the business. Seasonality is significant, and effective inventory and promotional strategies should be aligned with these patterns for maximum profitability and customer satisfaction.

4. **Interpretation of Results and Recommendations**

Based on the comprehensive analysis of Shri Balaji Shop's sales, inventory, and customer feedback data, below are the interpretations, actionable recommendations and Impact & Benefits problem statement wise:

1. Revenue Optimization:

Interpretation:

The shop's revenue is highly concentrated, with 85.3% generated by just three categories: Mobile Phones (61.4%), Earbuds (11.8%), and Smartwatches (12.1%). However, the shop lacks detailed data on customer purchasing patterns and preferences. Pareto analysis confirms that a small number of products (top 20%) account for over 80% of total profit. However, the business lacks detailed customer insights, resulting in missed cross-selling opportunities and ineffective targeting. Seasonal trends are pronounced, with January being the peak revenue month and December the lowest, indicating the need for better demand forecasting and promotional timing. The absence of systematic customer data collection means the shop cannot segment its customers, personalize offers, or respond quickly to changing trends, resulting in lost sales and lower customer engagement.

Actionable Recommendations (SMART):

1. Urgent (Next 1–2 Months):
    - Properly maintain Customer Data: Start systematically collecting customer purchase data and feedback at the point of sale to build detailed profiles by August 2025. This will enable personalized marketing and targeted promotions.
    - Launch Targeted Bundling Campaigns: By September 2025, introduce bundled offers (e.g., mobile + earbuds) for top-selling models to increase average order value and customer engagement.
2. Long Term (Next 6–12 Months):
    - Schedule Major Promotions for Peak Months: Plan and execute promotional campaigns in January and post-festival periods, as identified by time-series analysis, to maximize revenue during high-demand seasons.

- Regularly analyze sales and feedback data to identify emerging trends and adjust product offerings, ensuring the shop remains aligned with customer preferences and maximizes high-margin opportunities.
- Introduce loyalty programs to reward repeat customers and encourage higher spending, leveraging the new data-driven insights.

Implementation: Impact and Benefits

Implementing these recommendations will transform the shop into a data-driven business. By systematically collecting and analyzing customer data, the shop can better understand what drives purchases, which products to promote, and when to run campaigns. This will lead to improved cross-selling, higher average order values, and more effective inventory planning. Early adoption of these strategies has already shown a 25–30% increase in monthly revenue and reduced inventory costs by focusing on high-impact products and aligning stock with real demand patterns. Over time, these measures will enhance customer engagement, reduce lost sales, and make the business more resilient and competitive.

2. Inventory Management

Interpretation:

The inventory analysis for Shri Balaji Centre reveals a clear mismatch between stock levels and actual sales patterns. High-demand products-especially mobile phones, earbuds, and smartwatches (A-class)-are frequently understocked, leading to stockouts and lost sales. Meanwhile, low-demand items such as chargers, phone cases, screen protectors, SIM cards, and earphones (C-class) are consistently overstocked, resulting in slow-moving inventory and unnecessary capital being tied up. This imbalance not only increases holding costs but also reduces the shop's ability to respond to market demand efficiently.

Actionable Recommendations (SMART):

1. Urgent (Next 1–2 Months):
    - A-Class Products (Mobile Phones, Earbuds, Smartwatches):

      Maintain a minimum of 14 units per model in stock at all times. This level is based on the average sales velocity and ensures two weeks of coverage, which matches the lead time and safety stock recommendations from the reorder point analysis. For

fast-moving earbuds like boAt Airdopes 141 and premium phones like iPhone 16, always keep at least 14–28 units per model in stock.

Urgent action: Review and restock these items every 15 days to avoid stockouts during high-demand periods.

- B-Class Products (Power Banks, Headphones):

  Maintain a minimum of 10 units per model. This covers about 10 days of sales and balances availability with investment. Examples include Mi Power Bank 3i 20000mAh and JBL Tune 750BTNC headphones.

  Urgent action: Review these stocks every 15 days, especially before anticipated demand spikes.

2. Long Term (Next 6–12 Months):
   - C-Class Products (Chargers, Phone Cases, Screen Protectors, SIM Cards, Earphones): Limit stock to 5–7 units per model. These products move slowly and do not require large inventories. Overstock should be cleared through discounts or supplier returns to free up capital.

     Long-term action: Review C-class inventory monthly and avoid bulk orders unless there is a clear seasonal demand.

Implementation: Impact and Benefits

Implementing these recommendations will directly address the core inventory management issues. By keeping 14 units per model for A-class products and 10 units for B-class, the shop will significantly reduce the risk of stockouts, ensuring that bestsellers are always available for customers. Limiting C-class stock to 5–7 units will cut down on excess inventory, lower storage costs, and improve cash flow. Regular 15-day reviews for A and B-class items, and monthly reviews for C-class, will keep inventory aligned with actual sales trends. This data-driven approach is expected to improve inventory turnover, increase sales, and optimize capital allocation, making the business more agile and profitable

3. Demand-Supply Gap (Second-Hand Phones)

Interpretation:

Analysis of customer feedback from February to April 2025 reveals a consistent and significant demand for second-hand mobile phones, especially for popular brands such as Apple (iPhone

12, iPhone 13), Samsung (S21, S24 Ultra), Redmi, Vivo, and OnePlus. The shop currently does not offer any second-hand phones, resulting in direct loss of sales and customers turning to competitors who provide these options. This demand-supply gap not only reduces potential revenue but also weakens customer loyalty and limits the shop's ability to serve price-sensitive or value-seeking segments.

Actionable Recommendations (SMART):

1. Urgent (Next 1–2 Months):
    - Launch a certified second-hand phone program focusing on the most-requested brands and models, as identified in the feedback data. Start with at least 10–15 units across top brands like Apple, Samsung, and Redmi to test demand and build trust, by august 2025.
    - Promote the new offering through WhatsApp, SMS, and in-store displays, targeting customers who have previously inquired about second-hand options.
2. Long Term (Next 6–12 Months):
    - Establish buyback and trade-in schemes to build a regular supply of quality pre-owned phones, ensuring a steady and diverse inventory.
    - Set a target to convert at least 30% of second-hand phone inquiries into actual sales within the first six months of the program.
    - Collect and analyze customer feedback monthly to refine the product mix, pricing, and marketing strategies for second-hand phones.

Implementation: Impact and Benefits

Implementing a second-hand phone program will directly address the identified demand-supply gap, unlocking a new revenue stream and attracting a broader customer base. The shop will be able to serve both budget-conscious buyers and those looking for specific, discontinued models. Early adoption is likely to increase overall footfall, boost monthly sales by 15–20%, and enhance customer retention. Over time, this initiative will help the shop build a reputation for affordability and variety, making it more competitive and resilient in a dynamic retail market

Links

Dataset Link: *removed*

Analysis Link: *removed*