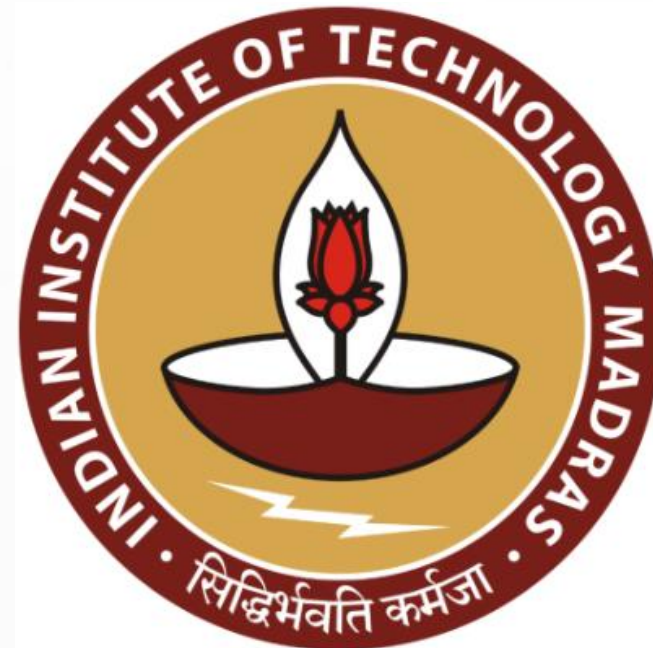


# DATA-DRIVEN OPTIMIZATION OF SALES AND INVENTORY MANAGEMENT OF A MOBILE & ACCESSORIES SHOP



Course: Business Data Management Capstone Project

IITM Online BS Degree Program,  
Indian Institute of Technology, Madras, Chennai  
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# ORGANIZATION BACKGROUND

Shri Balaji Centre is a Mobile & accessories shop operating in B2C segment located in Rajajipuram, Lucknow, Uttar Pradesh.

- They offer smartphones, accessories, and services like mobile repair, photocopying, reservations.
- Brands: Samsung, Realme, Apple, Google, Oppo, Vivo, OnePlus, BOAT, FireBolt, Noise.
- Goal: Evolve into a one-stop shop for mobile tech; plans to sell laptops/PCs.

The project focused on increasing revenue, optimizing inventory, and capturing lost sales by meeting demand for second-hand mobiles through data-driven insights into customer preferences and purchasing patterns.





# PROBLEM STATEMENTS

**1**

The shop struggles to maximize revenue and engage customers due to insufficient data on purchasing patterns and preferences, leading to lost sales.

**2**

Excess low-demand stock leads to financial losses, while stock outs of high-demand items result in lost sales.

**3**

Customers are requesting second-hand phones, but the shop currently doesn't offer so there is a loss of additional sales.

# DATA COLLECTION

Time Period of each Dataset Collected-

- Primary data collected directly from Shri Balaji Centre's sales and inventory records (Nov 2024 - Apr 2025)
- Customer feedback data on second-hand mobiles collected in-store (Feb 2025 - Apr 2025)

**Sales & Inventory Records:** Daily logs from Shri Balaji Centre detailing products sold, categories, prices, discounts, stock levels, and profits. Used to analyze sales trends, identify bestsellers, and optimize inventory.

**Customer Feedback on Second-Hand Mobiles:** Customer preferences and demands for second-hand phones, including models and brands requested. This reveals unmet demand to guide a potential second-hand phone program.

This is how the three datasets sheets looks like:

Sales\_rawdata(Nov'24-Apr'25)

Inventory\_rawdata(Nov'24-Apr'25

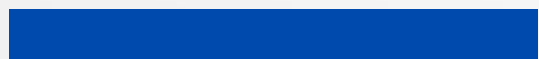
Customer Feedback Data



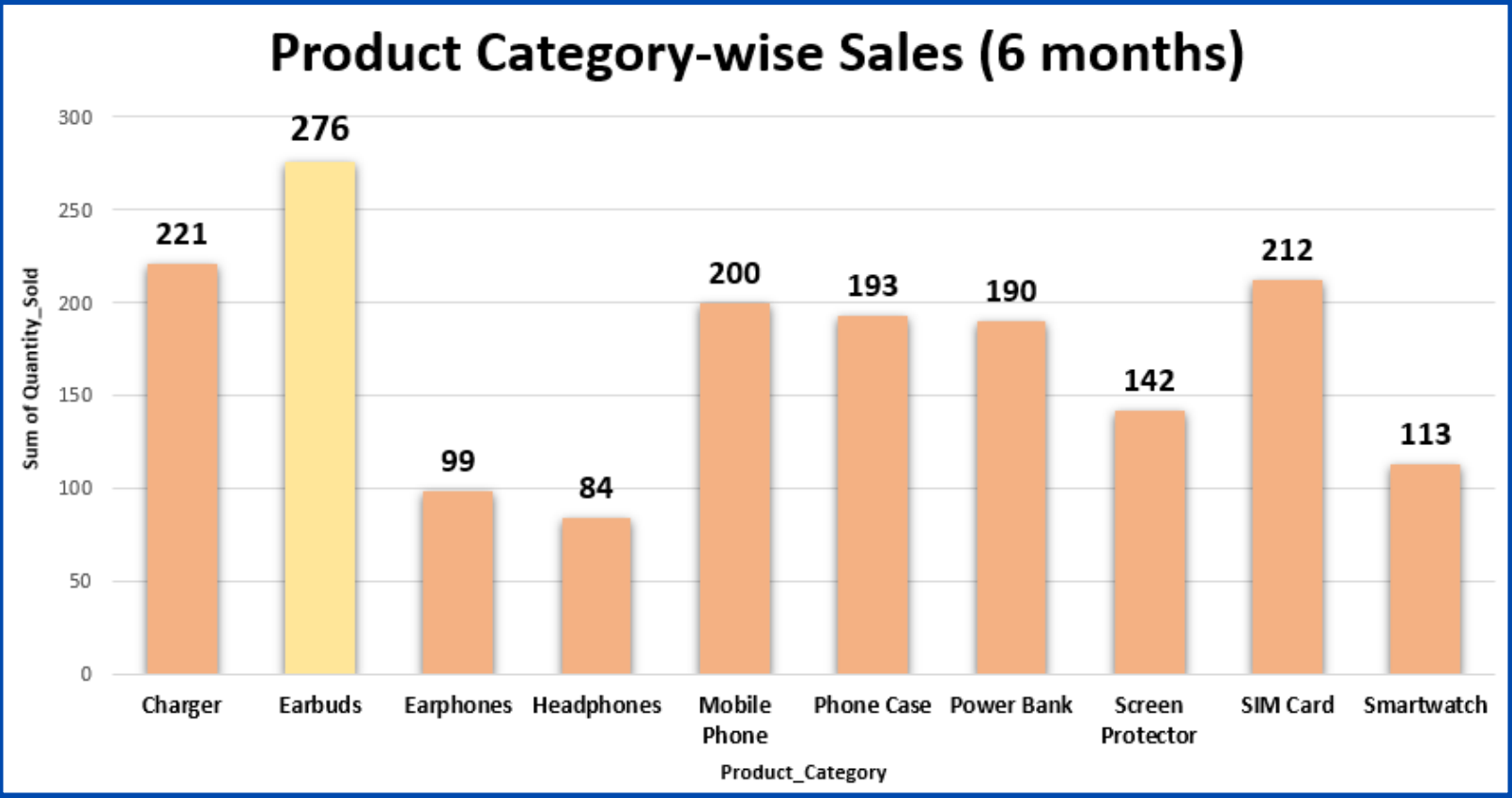
# METHODOLOGY & TOOLS

- Microsoft Excel: Used for cleaning data (handled missing values, removing duplicates, fixing formats) and detailed analysis (descriptive stats, Pareto, ABC, time series) to identify sales trends, key products, and inventory priorities. Excel suits the dataset size and offers transparent, easy analysis.
- Used Charts feature to visualize revenue, sales trends, ABC inventory classes, and seasonality for clear insights and informed decision-making by the shop owner.
- Inventory Control: Applied Safety Stock and Reorder Point calculations for A and B-class products to ensure timely restocking and avoid stockouts or excess inventory, improving profitability and operational efficiency.
- Customer Feedback: Aggregated in-store customer requests for second-hand phones by brand and model, guiding a pilot program to meet unmet demand and capture lost sales.

This combined approach delivers practical, data-driven insights tailored to the shop's scale and goals.

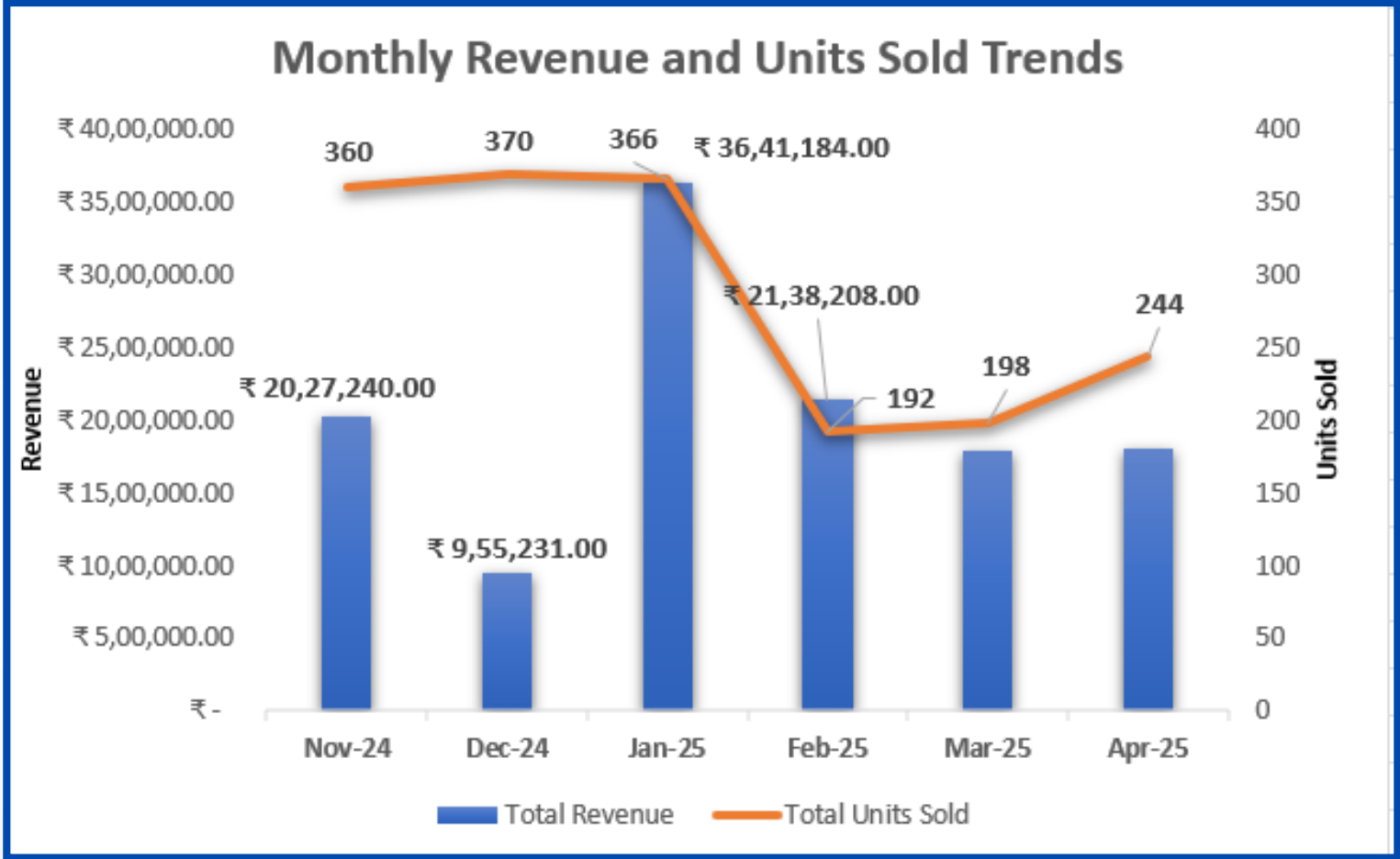


# RESULTS AND FINDINGS

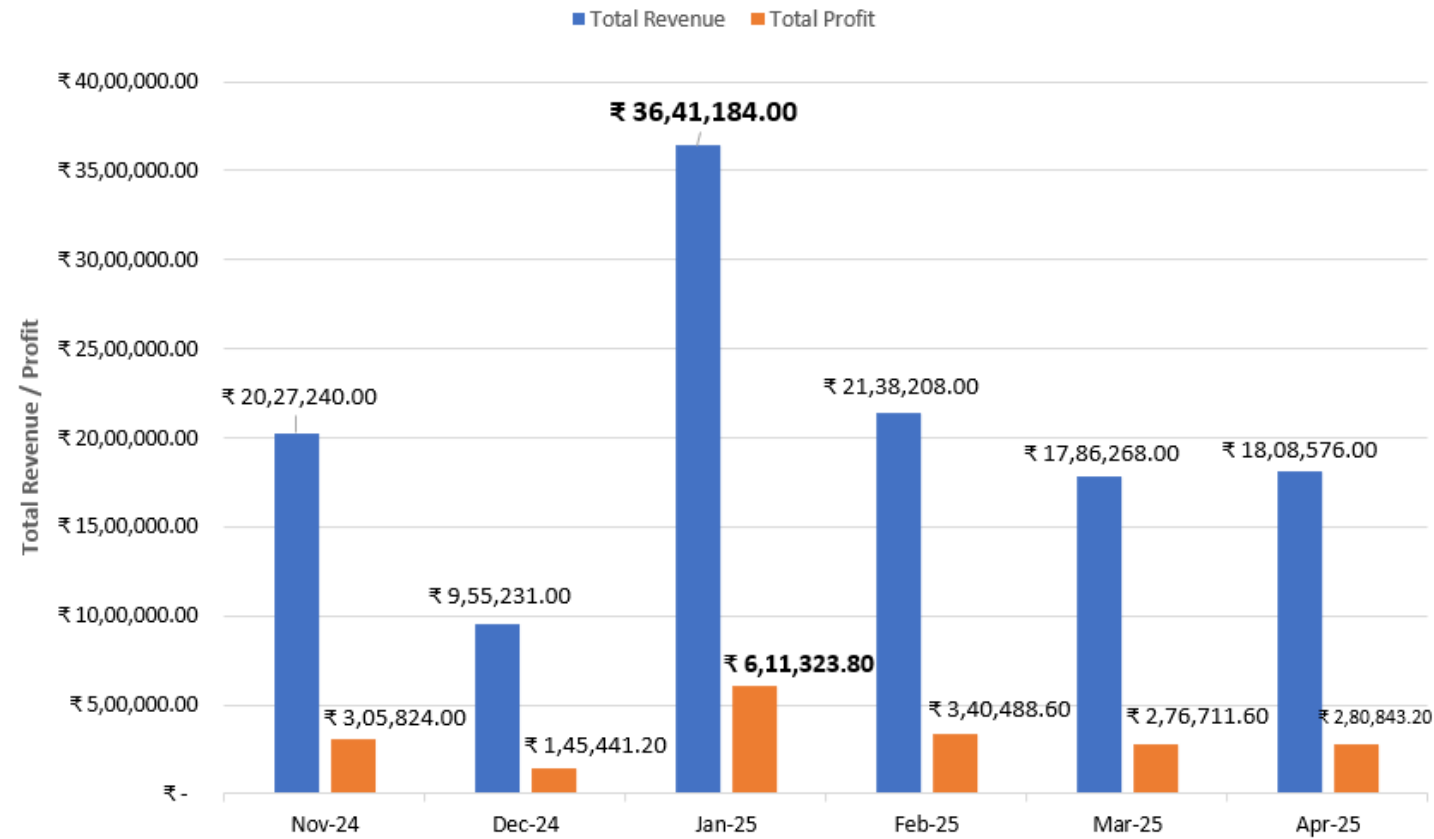


- Earbuds are the best-selling category with 276 units in 6 months, followed by Chargers and SIM Cards.
- Mobile Phones, although fewer in units (200), make up the bulk of revenue due to higher price points.
- Screen Protectors and Earphones see lower sales, suggesting infrequent or one-time buys compared to accessories like earbuds and chargers.

- Sales peaked in January 2025 with 366 units sold and highest revenue, coinciding with the post-New Year period—a strong indicator of seasonal demand.
- Lowest revenue in December 2024, suggesting a pre-festival lull or cautious consumer spending.
- Steady recovery observed from March to April 2025, with both revenue and units sold gradually increasing.



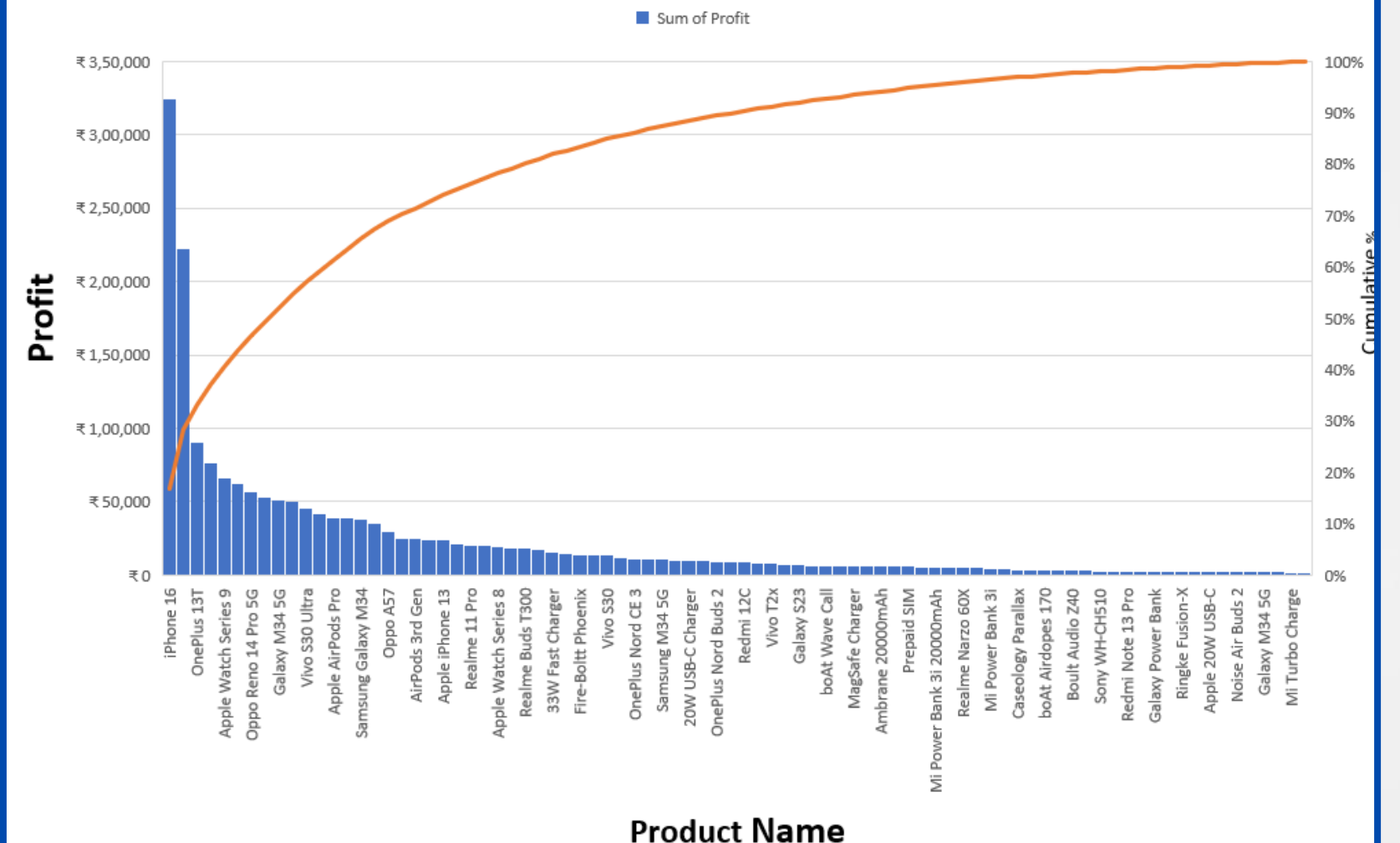
### Revenue-Profit Comparison



- January 2025 stands out with both maximum revenue (₹36.4 lakh) and the highest profit (₹6.11 lakh).
- December 2024 shows low profit, aligning with its overall low revenue.
- Profits rise and fall in tandem with revenue except in March 2025, where profit dips despite stable revenue, highlighting possible margin or cost fluctuations.

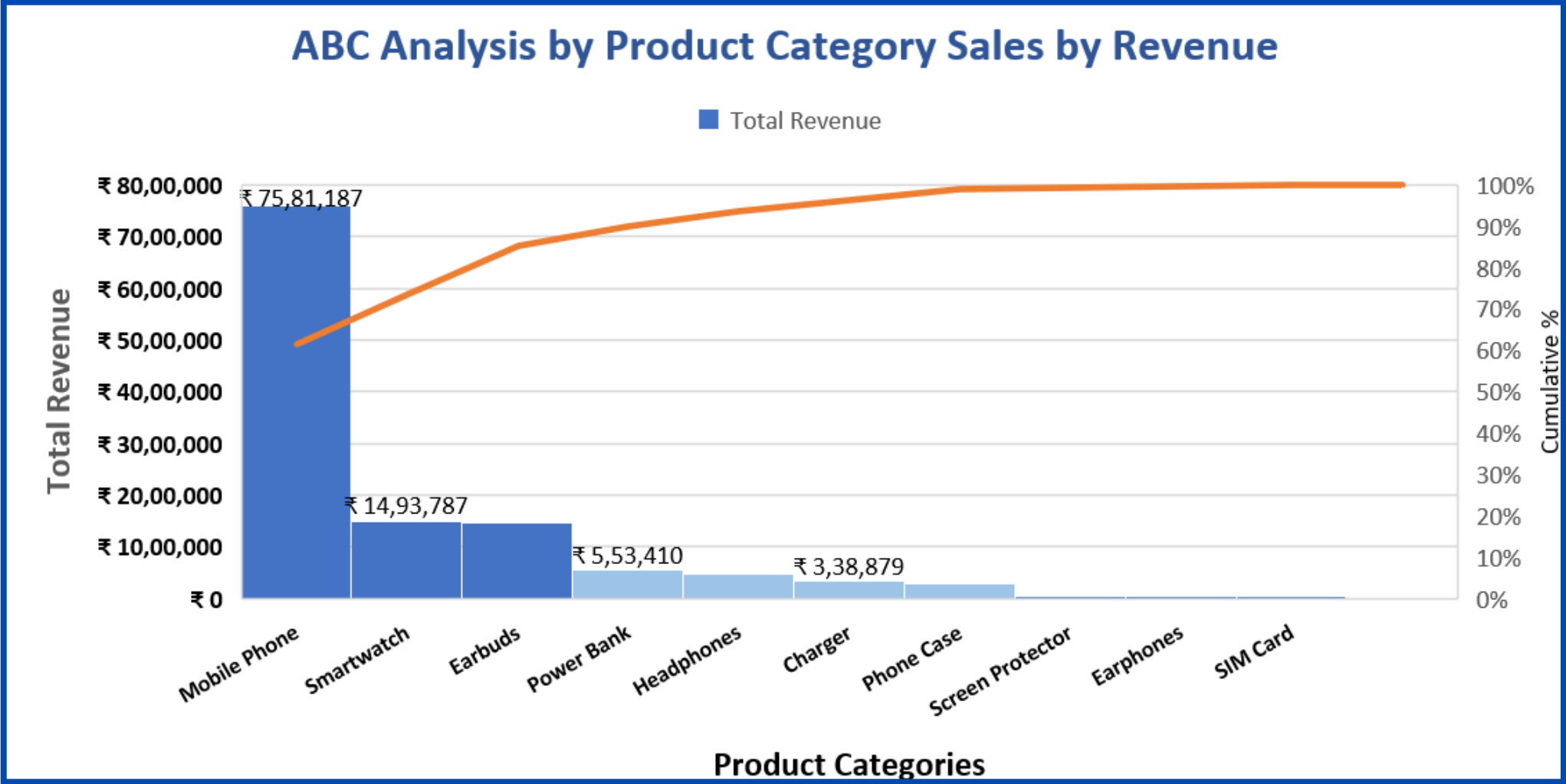
- Top 20% of products (e.g., iPhone 16, iPhone 15, OnePlus 13T, AirPods Pro 2, Apple Watch Series 9) generate over 80% of total profit, highlighting the critical importance of focusing marketing, stocking, and promotional efforts on these bestsellers.
- Most products contribute minimally to overall profits, so deprioritizing slow-moving items can improve capital allocation and reduce excess inventory.

### Pareto Analysis of Product-Wise Profit





- A-Class products (Mobile Phones, Earbuds, Smartwatches) generate 85.3% of total revenue despite being fewer in number –these are must-stock and must-promote items.
- Mobile Phones alone contribute 61.4% of revenue, making them the main driver for business growth.
- B and C-Class products (Power Banks, Headphones, Chargers, Phone Cases, etc.) together make up less than 15% of revenue, indicating that overstocking these can lock up capital unnecessarily.
- Focusing inventory and marketing efforts on A-Class categories can maximize revenue and improve inventory turnover.

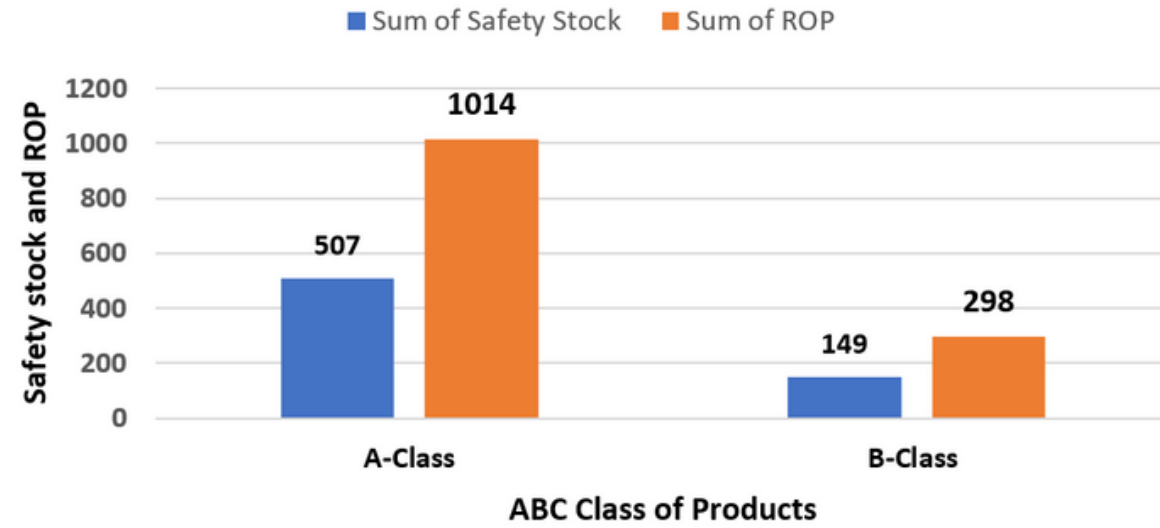


Sorting and Categorizing Products		
Based on the data:		
A-Class (70-80% of revenue):	Mobile Phones	₹ 75,81,187 (61.4% of total revenue)
	Earbuds	₹ 14,62,624 (11.8%)
	Smartwatches	₹ 14,93,787(12.1%)
B-Class (15-20% of revenue):	Power Banks	₹ 553,410 (4.5%)
	Headphones	₹4,85,216 (3.9%)
C-Class (5-10% 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%)

- Use ABC analysis for better stock control:
- A-Class: Higher stock and frequent checks.
  - B-Class: Moderate attention.
  - C-Class: Minimal inventory to avoid overstock and free up capital.

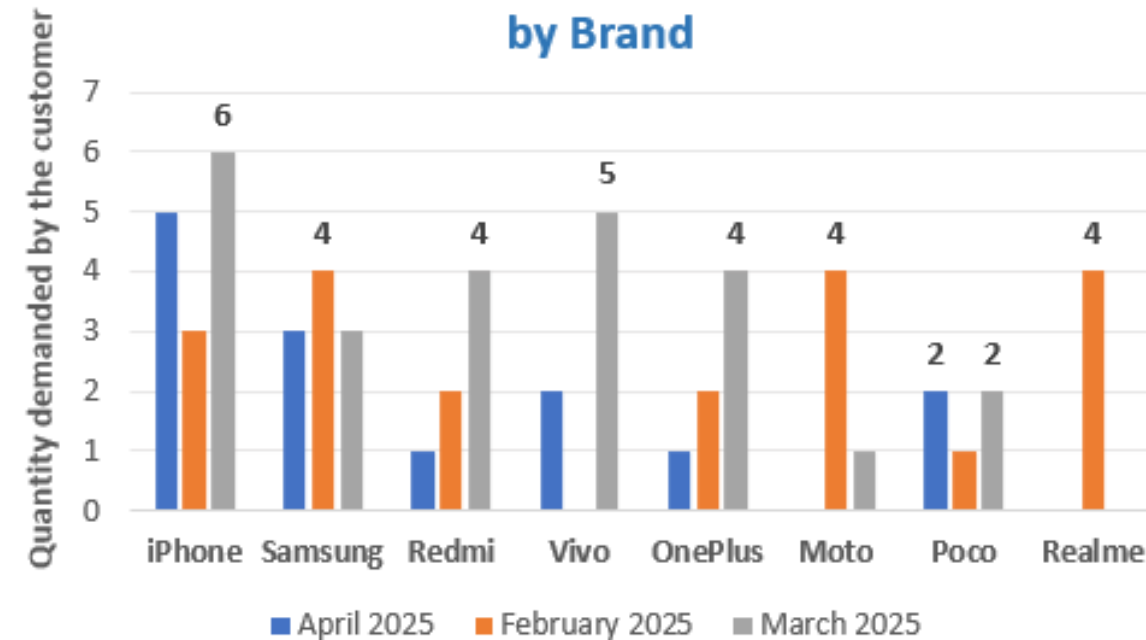


**Reorder Point and Safety Stock Levels by Product Class**



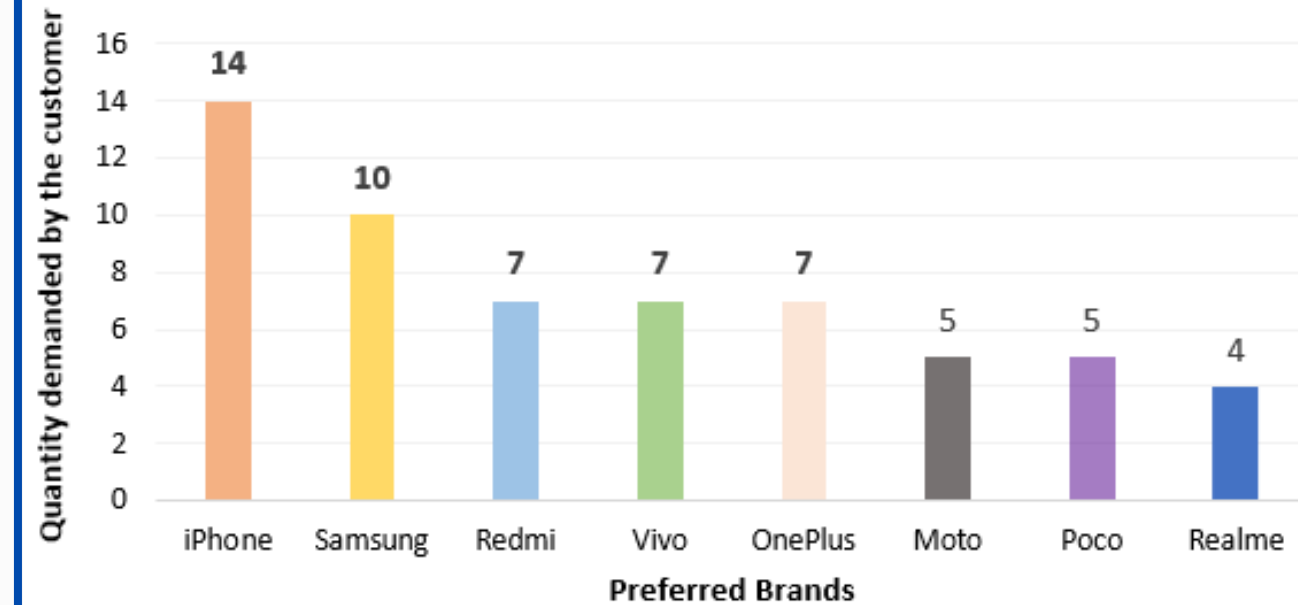
- A-Class products (Mobile Phones, Earbuds, Smartwatches) have significantly higher safety stock and ROP to prevent stockouts and capture most revenue opportunities.
- B-Class products require moderate safety stock and reorder points, balancing risk of stockouts with tying up less capital.
- Strict inventory controls on A-class items help maintain customer satisfaction and sales continuity.

**Monthly Demand for Second-Hand Phones by Brand**



- Consistent monthly demand for iPhones, Samsung, and Redmi models across the last three months.
- Demand remains steady or grows for most top brands from February to April 2025, reflecting persistent interest in second-hand options.
- Launching a focused second-hand phone pilot with these brands will address a proven market gap and unlock additional revenue.

**Brand-wise demand based on feedback**



- iPhone leads customer demand for second-hand phones, followed by Samsung and Redmi.
- Customer feedback highlights high potential in stocking Apple, Samsung, and Redmi phones for quickest gains.
- Capturing this unmet demand will help increase sales and attract new customer segments seeking specific brands.

# INTERPRETATION AND RECOMMENDATIONS

1

## 1. For Improving Revenue:

- Revenue is concentrated: Top 3 categories (drive 85.3% of revenue from Mobiles (61.4%), Earbuds (11.8%), Smartwatches (12.1%)). Top 20% products (e.g., iPhone 16, iPhone 15, OnePlus 13T) deliver 80%+ profit.
- Lacks customer data for targeted marketing and cross-sell
- Action: Start systematic customer data collection (by Aug 2025); launch bundled offers for bestsellers (by Sep); schedule promotions in Jan/post-festival; introduce loyalty program
- Impact: 25–30% revenue increase by focusing on key segments

2

## 2. Inventory Management

- Frequent stockouts of A-class products (Mobiles, Earbuds, Smartwatches); overstocking of low-demand items (Chargers, Cases, SIMs).
- Imbalance leads to lost sales and high holding costs
- Action: Keep  $\geq 14$  units for A-class, 10 for B-class, 5–7 for C-class; review A/B every 15 days, C monthly; clear excess stock
- Impact: Reduces lost sales, cuts excess inventory, improves turnover

3

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

- High, consistent demand for second-hand Apple, Samsung, and Redmi phones remains unmet.
- Continual, unmet demand for second-hand Apple, Samsung, Redmi, etc.
- Losing customers to competitors
- Action: Pilot second-hand program (10–15 units, Aug 2025); promote via WhatsApp/SMS; launch trade-in scheme; target  $\geq 30\%$  inquiry conversion in 6 months. Promote via digital channels, and refine offerings with regular customer feedback.
- Impact: Adds 15–20% new sales; retains and attracts price-sensitive customers
- Implementing these actions will drive revenue, reduce lost sales, and optimize inventory—making the shop more competitive and customer-focused.

**THANK YOU !**

