Optimizing Inventory and Sales through Data-Driven Strategies for a Small B2C Retail Shop

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SUBMITTED BY

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Organization Background

- The store was established in August 2020 in A.G. Colony, Patna, serving students, working-class people, and the local community.
- It operates as a small-scale retail shop offering stationery items, mobile accessories, and printing services.
- Monthly sales are ranging between ₹7,000–₹16,000, and the entire business is managed by a single person, Rakesh Kumar.

Problem Statement

➢ Low Profit Margin

- Sales are low while operating costs (rent, electricity, etc.) are increasing.
- The small gap between selling price and expenses limits overall profitability.

➢ Weak Customer Retention & Acquisition

- Lack of consistent customer engagement reduces repeat purchases.
- Minimal customer acquisition leads to declining sales and poor market viability.

➢ Inefficient Inventory Management

- No standardized system to identify fast-moving and slow-moving items.
- Frequent stockouts of high-demand products and overstock of slow sellers.
- Struggle to adapt with fast-changing trends & seasonal demand.

Data Collection and Methodology

➢ Data Collection:

- Data Collected from the shop owner from March to November 2024.
- Includes item-wise sales revenue for stationery, mobile accessories, printing, and entertainment categories.
- Stock inflow, outflow, and product availability manually recorded and verified with the shop owner.

➢ Data Preparation:

- Cleaning and organizing the data in Excel.
- Segmenting data by category, month, and product type for analysis.

Methodology

Step 1: Data Cleaning & Structuring	• Removing inconsistencies, duplicates, and mismatched entries • Creating uniform item name for consistent inventory tracking.
Step 2: Exploratory Data Analysis (EDA)	• Conducted in Excel using pivot tables, line charts, bar charts, and trend lines. • Identifying best-selling and slow-selling items, seasonal variations, and category-wise revenues.
Step 3: Inventory Analysis & ABC Categorization	• Classifying products into A/B/C categories based on value and demand. • Helps prioritize stock control, manage shelf space, and reduce overstock losses.
Step 4: Profit Margin Optimization	• Analyzing low-margin items for potential price revision. • Considering bundling, seasonal pricing, and demand-based adjustments

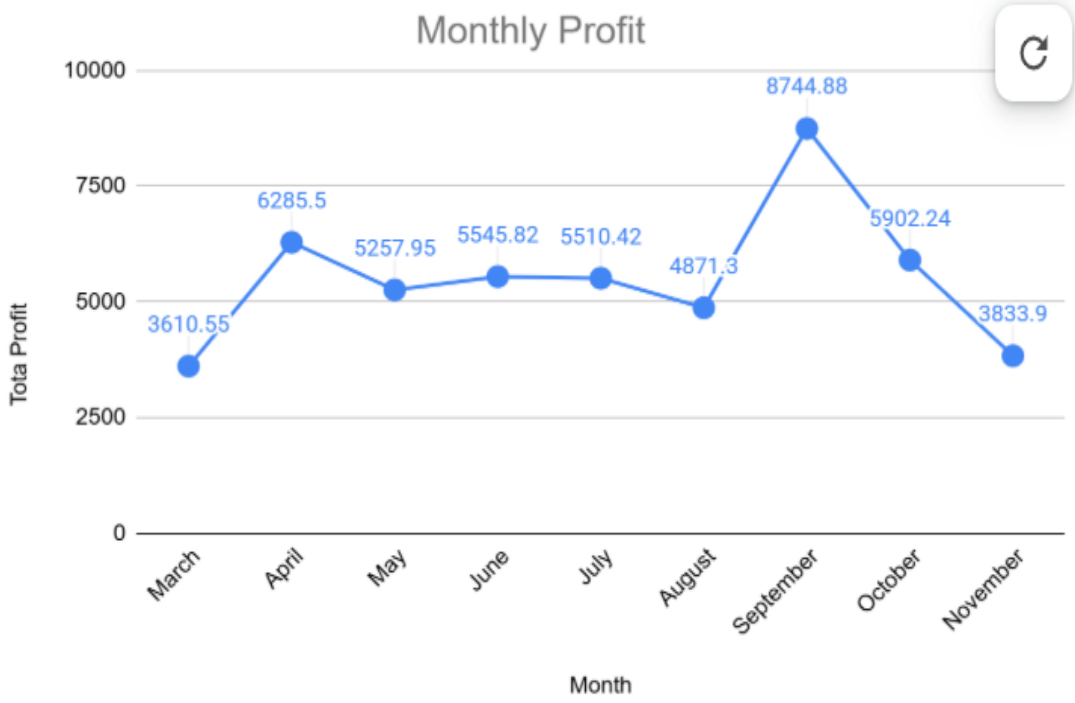
Results and Findings

The monthly trend analysis clearly shows seasonal variation in profit performance throughout 2024.

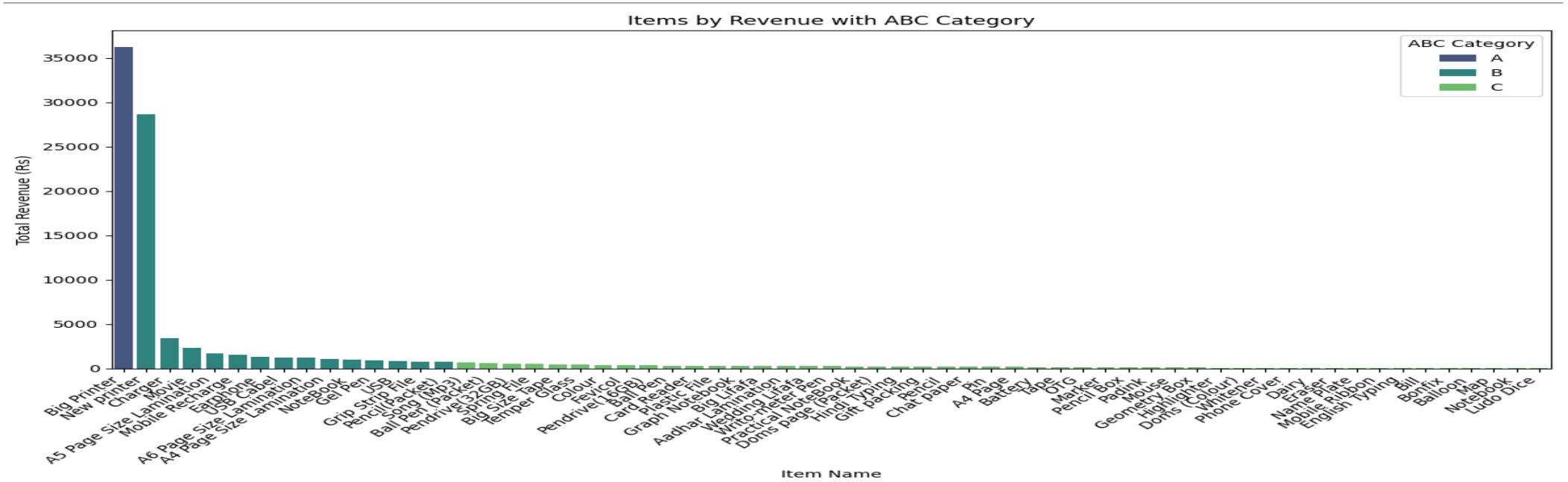
Peak Profit: September (₹8,745) – attributed to festival and academic season demand.

Lowest Profit: March (₹3,611) – off-season slump after exams and .

3.1 Monthly Profit Trend Analysis



Results and Findings



Category A: 10–15% of items generate 70% of total revenue (e.g., Big Printer , Colour Print,).

Category B: 20% of items account for 20% of total revenue (e.g., Mobile Tempered Glass, Lamination Services).

Category C: 65% of items produce less than 10% of total revenue (e.g., low-demand stationery)

Interpretation and Recommendations

Interpretation

- The analysis revealed low profit margins on several stationery and everyday-use items, mainly due to underpricing and high operational costs.
- Customer retention is weak; repeat purchase patterns are inconsistent, indicating low customer loyalty and insufficient engagement strategies.
- Inventory patterns show mismatches between stock levels and actual demand—some fast-moving items frequently go out of stock while slow-moving items remain overstocked.
- High-margin items contribute a major share of profits, while low-margin items pull overall profitability down, indicating pricing imbalance.
- Visualizations indicated clear clusters of products where small price adjustments could significantly increase margins without affecting sales volume.

Interpretation and Recommendations

➢ Recommendations (Actionable & Data-Driven)

- **Optimize Pricing (Increase 3–5% on Low-Margin Items):**
  Slightly price increments on low-margin but inelastic items can increase total profit.
- **Introduce Customer Loyalty Program:**
  Offer reward points, targeted discounts, and membership benefits to increase repeat purchases and boost customer retention.
- **Demand-Driven Inventory Management:**
  Use sales frequency data to classify items as fast-moving vs slow-moving, and reorder based on demand trends to reduce overstock and stockouts.
- **Promote High-Margin Products:**
  Increase visibility of high-margin categories (e.g., premium accessories or trending items) through in-store placement and combo offers.

Conclusion

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- The project identified key operational issues affecting profitability, retention, and inventory performance.
- Data-driven insights highlighted clear opportunities to improve margins, attract repeat customers, and streamline stock flow.
- Implementing the recommended changes can lead to higher profitability, better customer engagement, and more efficient store operations.

DatasetLink:Excel File Link, Collab link

THANK YOU

- Thank you for your time and attention
- Thank you to Dr. Ashwin J Baliga, Dr. Aaditya Chandel and the TAs for the guidance and support for throughout the journey of BDM project