

Exploratory Data Analysis (EDA)

EDA helps uncover key patterns and trends within the data, providing actionable business insights. By analyzing sales by day, month, and category, we identify peak transaction periods and customer preferences. Regional and company-specific trends reveal strengths in specific categories and products, guiding targeted marketing and inventory strategies. Insights on top customers, average spending, and best-selling categories enable optimization of pricing, promotions, and loyalty programs. Overall, EDA offers a comprehensive understanding of consumer behaviour and business performance, empowering data-driven decision-making to enhance profitability and customer satisfaction.

Here are the business insights based on our ideas:

1. Date and Time of Order Trend

- An analysis of the provided data shows that transactions are evenly distributed across weekdays, peaking slightly on Tuesday (163) and dipping on Friday (125). Monthly transactions reveal seasonality, with peaks in January (107) and steady activity from March to September.
- This indicates potential opportunities for targeted campaigns during high-volume months and weekdays, especially Tuesday. Encouraging sales during low-transaction months like November (57) with special promotions or discounts could boost performance.
- Similarly, optimizing workforce allocation and stock management for January and midweek may improve operational efficiency and maximize revenue potential.

2. Best-Selling Product for Each Category in Each Region

- The data highlights regional preferences and top-performing products across categories. In South America, books (241 units) and electronics (198 units) lead sales, while Europe shows strong demand for home decor (167 units) and books (165 units). North America prioritizes electronics (153 units) and clothing (147 units), and Asia favours clothing (166 units) and home decor (142 units).
- Tailored strategies should target regional preferences, such as promoting SoundWave Cookbooks and TechPro Headphones in South America, expanding ActiveWear Jeans and ComfortLiving Cookware in Asia, and emphasizing home decor in Europe. Leveraging these insights enables localized marketing, inventory optimization, and maximized revenue potential.

3. Average Amount Spent Per Category and Total Transactions

- Clothing generates the highest average spending per transaction (₹728.82), suggesting premium pricing potential or bundling opportunities for related products. Electronics and books have similar average spending (₹711.75 and ₹711.66), reflecting strong customer value perception in these categories.
- Home decor has the lowest average spending (₹608.44) but maintains a significant number of transactions (248), indicating steady demand for budget-friendly items.
- These insights suggest focusing on upselling and cross-selling strategies in the clothing category while promoting high-value electronics and books. Enhancing product variety or offering discounts in home decor can increase both transaction volume and customer retention.

4. Top Customers Based on Amount Spent (Top 20%)

- High-value customers vary significantly by region, with Europe leading in total spending, exemplified by Customer C0141 (₹10,673.87). North America follows, where top customers, like C0065 (₹7,663.70), exhibit consistent high-value purchases. South America has strong engagement with customers like C0082 (₹7,572.91), while Asia showcases loyal customers such as C0054 (₹8,040.39).
- Focusing on personalized loyalty programs for these top spenders—such as exclusive discounts, early product access, and tailored recommendations—can improve retention. Additionally, regional campaigns targeting these segments can drive repeat purchases and strengthen brand advocacy, ensuring sustained revenue growth and higher lifetime value per customer.

5. Best-Selling Category Based on Quantity for each company

- The analysis highlights company strengths in specific categories. SoundWave leads in book sales (207 units), making it a strong contender for literary promotions.
- ActiveWear dominates electronics (179 units) and clothing (163 units), suggesting a diversified portfolio that appeals across categories. ComfortLiving excels in electronics (116 units), while HomeSense specializes in home decor (192 units), indicating opportunities for niche-focused marketing.
- TechPro and BookWorld are strong in books, with 153 and 119 units sold, respectively, showcasing their expertise in this category.
- Leveraging these insights, companies can expand best-selling product lines, implement cross-category bundling, and create targeted campaigns to maximize revenue.