

EDA Summary: Diwali Sales Analysis

Executive Summary

This analysis of the Diwali Sales dataset provides actionable insights into customer demographics, regional trends, product performance, and purchasing behavior during the festive season. The data highlights key drivers of sales and opportunities for targeted marketing, inventory optimization, and strategic planning.

Key Insights and Findings

1. Demographic Insights

- **Gender-Based Purchasing:**
 - Female customers placed more orders (19,548) than males (8,433), showcasing stronger engagement.
 - Higher Average Order Value (AOV) for female customers, reflecting a preference for quality over quantity.
- **Age Group Trends:**
 - The 26-35 age group dominates sales, contributing the most to total orders.
 - Young adults (18-25) prefer discounted and budget-friendly products.
 - Customers aged 50+ made fewer purchases but had the highest AOV, indicating a preference for premium products.

2. Regional Performance

- **State-Level Insights:**
 - Top-performing states: Uttar Pradesh (₹19.37M), Maharashtra (₹14.42M), and Karnataka (₹13.52M).
 - Delhi leads in AOV (₹4,235), while Uttarakhand recorded the lowest (₹3,059).
 - States with lower engagement (e.g., Punjab and Telangana) present opportunities for targeted campaigns.
- **Zone-Based Trends:**
 - Central Zone dominates with 10,623 orders, followed by the Southern Zone with 6,740.
 - Eastern Zone shows low engagement, highlighting potential cultural or market barriers.

3. Product Performance

- **Top Categories:**
 - Food leads in revenue (₹33.93M) and orders (6,110), driven by festive demand.
 - Clothing & Apparel (₹16.49M) and Electronics & Gadgets (₹15.64M) are other strong performers.

- **Underperforming Categories:**
 - Office Supplies (₹81,936) and Veterinary Products (₹112,702) show low demand, suggesting room for improvement.
 - **Profitability:**
 - Categories like Beauty and Sports Products have growth potential, with moderate sales but higher profitability per unit.
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4. Customer Behavior

- **Payment Methods:**
 - Digital payments dominate, reflecting comfort with online transactions.
 - Cash on Delivery (COD) remains popular in rural areas.
 - **Order Size Distribution:**
 - Most orders consist of 1-4 items, with a focus on multi-item transactions (e.g., 2-item orders being most common).
 - Opportunities exist to encourage larger orders through bundling or promotional offers.
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5. Correlation Insights

- Weak correlations between demographic variables (e.g., age, marital status) and sales metrics suggest other factors like product type and pricing play a larger role.
 - Discounts positively correlate with order volume but slightly reduce profitability, underscoring the need for strategic discounting.
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Visual Insights

- **Bar Charts:** Highlighted state-wise sales and category performance.
 - **Heatmaps:** Showed correlations between discounts, product categories, and revenue.
 - **Box Plots:** Compared order amounts across states to identify regions with high purchasing power.
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Recommendations

1. **Targeted Marketing:**
 - Focus on the 26-35 age group, female customers, and top-performing states for maximum ROI.
2. **Regional Campaigns:**
 - Introduce region-specific promotions for underperforming states like Punjab and Telangana.
3. **Product Strategy:**

- Increase promotions for underperforming categories (e.g., Office Supplies) or revise product offerings.
 - 4. **Optimized Discounting:**
 - Offer targeted discounts on high-margin products to maintain profitability.
 - 5. **Expand Digital Payment Options:**
 - Promote cashless transactions, especially in rural areas, to streamline operations and improve customer convenience.
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Tools and Techniques Used

- **Tools:** Python (Pandas, Matplotlib, Seaborn, Plotly),
 - **Skills:** Data cleaning, exploratory data analysis, data visualization, statistical analysis
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Conclusion

The Diwali Sales dataset provides a robust foundation for understanding customer behavior, identifying growth opportunities, and refining sales strategies. These insights can guide businesses in enhancing marketing efforts, optimizing inventory, and boosting profitability during festive seasons.