

EDA and Business Insights Report

1. Introduction

This report provides insights derived from an exploratory data analysis (EDA) of an eCommerce transactions dataset. The dataset includes customer, product, and transaction details. The goal is to uncover patterns, trends, and business opportunities.

2. Dataset Overview

- **Customers Dataset:** Contains **200 unique customers**, their regions, and signup dates.
 - **Products Dataset:** Consists of 100 unique products across 4 categories: Books, Electronics, Clothing, and Home Decor.
 - **Transactions Dataset:** Comprises 1,000 transactions with details such as purchase date, quantity, total value, and product pricing.
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3. Key Findings from EDA

1. Top-Selling Products

- The most sold products are *SoundWave Jeans* and *SoundWave Cookbook*, each with 46 units sold.
- Other popular products include *TechPro Headphones* (45 units) and *ActiveWear Rug* (43 units).
- The **Books** and **Electronics** categories dominate in terms of product quantity sold.

2. Revenue Contributions

- The **Books** category contributes \$192,147.47 in total revenue, the highest among all categories.
- **Electronics** follow closely with \$180,783.50, while **Clothing** contributes \$166,170.66.
- **Home Decor** generates \$150,893.93, making it the lowest-performing category in terms of revenue.

3. Customer Activity

- The top 5 active customers are as follows:
 - Customer **C0141** completed 10 transactions with a total value of \$10,673.87.
 - Customer **C0054** completed 8 transactions, contributing \$8,040.39.
 - Customer **C0065** completed 10 transactions, contributing \$7,663.70.
 - Customer **C0156** completed 11 transactions, contributing \$7,634.45.
 - Customer **C0082** completed 7 transactions, contributing \$7,572.91.

4. Seasonal Trends

- Total revenue shows prominent peaks in certain months, potentially indicating seasonal demand spikes (e.g., during holidays or promotions). In contrast, total quantity remains relatively low and stable, with minimal variation across months. This suggests high-value transactions drive revenue rather than volume.

5. Strong Correlations

- The correlation matrix reveals the following relationships:
 - **Quantity and TotalValue:** A moderately strong positive correlation (+0.61), indicating that higher purchase quantities result in higher total transaction values.
 - **Price and TotalValue:** A strong positive correlation (+0.72), showing that higher-priced items contribute significantly to revenue.
 - **Quantity and Price:** A negligible correlation (-0.009), indicating no relationship between the number of items purchased and their pricing.
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4. Recommendations

1. Focus marketing efforts on high-revenue categories like **Books** and **Electronics** to maximize profits.
 2. Promote bulk-buy discounts to encourage larger purchases, as most transactions involve low quantities.
 3. Launch targeted campaigns during holiday months to capitalize on peak sales periods.
 4. Retain high-value customers by offering loyalty programs or exclusive deals.
 5. Explore category-specific strategies to boost sales in lower-performing categories like **Home Decor**.
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5. Conclusion

This analysis provides actionable insights to drive strategic decisions in product marketing, sales planning, and customer retention. The findings emphasize the importance of leveraging seasonal trends, customer behavior, and product performance to optimize business outcomes.