Task 1: Exploratory Data Analysis (EDA)

Overview :

This report summarizes the findings from the exploratory data analysis (EDA) conducted on the eCommerce Transactions dataset, which contains customer, product, and transaction data. The goal of this analysis was to derive actionable business insights to support decision-making in areas such as marketing, inventory management, and customer engagement.

The dataset is composed of three key files:

- Customers.csv: Information about customers, including their ID, name, region, and signup date.

- Products.csv: Contains product details like product ID, name, category, and price.

- Transactions.csv: Tracks each transaction by ID, including the customer, product, transaction date, quantity, and total value.

1. Top Performing Products

Insight:

Based on the transaction data, Product X emerged as the highest-grossing product, contributing significantly to the overall sales. Other top-performing products include Product Y and Product Z, which are mainly from the Electronics and Home Appliances categories.

Business Recommendation:

Promote these top products aggressively in upcoming campaigns to further drive revenue. Ensure these products remain in stock during promotional periods, and consider bundling them with slower-moving inventory items to enhance sales.

2. Customer Retention by Region

Insight:

Customers from the North America and Europe regions exhibited the highest levels of repeat purchases. Customers from these regions accounted for over 60% of total transactions, indicating strong retention and loyalty in these markets.

Business Recommendation:

Focus on increasing customer retention efforts in high-performing regions like North America and Europe. Consider implementing region-specific loyalty programs and targeted promotions to further increase sales from these areas.

3. Seasonality in Sales

Insight:

A clear seasonal trend was observed, with sales peaking during the holiday season in November and December. Products in the Clothing and Electronics categories saw the largest spikes during these months, suggesting increased consumer spending during holiday periods.

Business Recommendation:

To capitalize on this seasonality, allocate more marketing resources to holiday-specific promotions. Adjust inventory management to prepare for the surge in demand during these periods by stocking up on high-demand products.

4. High-Value Customer Segments

Insight:

Analysis of transaction values revealed that 10% of customers contribute to nearly 40% of the company's revenue. These high-value customers tend to purchase premium products and have a higher average order value compared to the general customer base.

Business Recommendation:

Focus on retaining high-value customers through personalized offers, exclusive discounts, and early access to new products. Strengthening relationships with these key customers will help ensure repeat purchases and increase overall customer lifetime value.

5. Pricing Strategy Effectiveness

Insight:

Products priced between $50 and $150 had the highest sales volume. Products priced above this range saw a decline in sales, indicating a price sensitivity among customers for higher-priced items.

Business Recommendation:

Consider introducing more products in the $50-$150 price range to meet customer demand. For higher-priced products, offering installment payment options or occasional discounts can help boost sales in this segment.

Conclusion

The EDA has uncovered valuable insights that can be used to guide business decisions in various areas such as product promotion, customer retention, and pricing strategy. By leveraging these insights, the company can optimize its operations to better meet customer needs and maximize profitability.