

## **1. Introduction**

This report presents key business insights derived from exploratory data analysis (EDA) on customer transactions, product sales, and revenue distribution. The objective is to extract meaningful patterns that can guide business strategies and decision-making.

## **2. Key Findings and Insights**

### **2.1 Customer Analysis**

- Customers are distributed across multiple regions, with North America and Europe contributing the highest revenue.
- The majority of customers make repeat purchases, indicating strong customer retention.
- High-value customers (top 10% in total spending) account for a significant share of the company's revenue.

### **2.2 Product Performance**

- The top 10 best-selling products belong to electronics and fashion categories.
- Certain high-priced items generate substantial revenue despite lower sales volume.
- A small number of products contribute to the majority of revenue, indicating a skewed sales distribution.

### **2.3 Revenue Trends**

- Seasonal spikes in sales were observed during holiday seasons and promotional periods.
- Monthly sales trends indicate a steady increase in revenue, with occasional dips that align with off-season periods.
- Some regions generate high revenue but have a lower number of transactions, suggesting higher average order values.

### **2.4 Customer Similarity and Lookalike Model**

- Customers were grouped based on their spending behavior and purchase history.
- A Lookalike Model identified the top 3 similar customers for each of the first 20 customers.
- Similar customers tend to buy from the same product categories, providing opportunities for targeted recommendations and cross-selling.

### **2.5 Customer Segmentation and Clustering**

- Using K-Means clustering, customers were segmented into four distinct groups based on spending and purchase frequency.
- High-spending customers exhibit consistent purchase patterns, making them ideal for loyalty programs.
- Lower-spending customers could be targeted with personalized offers to increase their transaction volume.

## **3. Recommendations**

### **3.1 Enhancing Revenue Growth**

- Focus marketing efforts on high-value customers through loyalty programs and exclusive deals.
- Expand high-selling product categories by introducing similar offerings or bundling options.
- Optimize pricing strategies for high-value items to maximize profitability.

### **3.2 Improving Customer Retention**

- Implement targeted email campaigns for customers based on their purchase history.
- Offer personalized product recommendations to increase engagement.
- Introduce customer referral programs to drive organic growth.

### **3.3 Optimizing Inventory and Sales Strategy**

- Increase stock levels for best-selling products to prevent lost sales due to stockouts.
- Analyze slow-moving products and consider discounts or promotions to clear inventory.
- Adjust regional marketing efforts based on revenue performance to maximize profitability.

## **4. Conclusion**

The analysis highlights the importance of customer segmentation, product performance tracking, and revenue optimization strategies. By leveraging these insights, the company can enhance customer engagement, increase revenue, and streamline operations. Implementing data-driven marketing and sales strategies will further improve overall business performance.