

# **Exploratory Data Analysis (EDA) and Business Insights**

## **1. Introduction**

This report provides some key insights from an eCommerce transactions dataset's exploratory data analysis (EDA). The dataset contains 200 customers, 100 products, and 1,000 transactions with information on customer demographics, product information, and purchase history. The key trends and patterns are summarised below.

## **2. Key Business Insights**

### **1. Top Customers & Revenue Distribution**

- The highest spender is Customer C0141, with total purchases worth \$10,673.87, followed by C0054 (\$8,040.39) and C0065 (\$7,663.70).
- The top five customers contribute a significant share of total revenue, showing that a small percentage of customers drive the most sales.
- Actionable Step: Implement VIP customer retention programs and personalized offers to maintain engagement among high-value customers.

### **2. Transactions Over Time & Seasonal Trends**

- The highest transaction count was observed in January 2024 at 107, and the lowest occurred in December 2023 with 4.
- A stable mid-year performance occurred from April through August 2024 where transaction counts hovered between 70 to 96 for each month
- The year-end downturn in December 2024 hints at a seasonal slump or lower customer engagement.
- Actionable: Run holiday-themed promotions in December and post-holiday offers at the beginning of January to manage demand fluctuations

### **3. Customer Signup & Purchase Behaviour**

- The average signup date is July 9, 2023. Signups have occurred between January 22, 2022, and December 28, 2024.
- Most customers are not repeat buyers, which presents retention issues.
- Actionable Step: Improve onboarding, offer welcome discounts, and encourage loyalty programs to drive repeat purchases.

### **4. Pricing & Sales Patterns**

- The prices of products vary widely from a minimum of \$16.08 to a maximum of \$1,991.04.
- The average transaction amount is \$690, with 2.54 units per transaction.
- Actionable: Bundle frequently bought items to encourage more frequent purchases.

### **5. Consistency in Demand for Products & Retention of Customers**

- A consistent purchasing pattern from April to August 2024 reflects that the demand for products is stable.
- A retention strategy is required because a large proportion of customers transact only once.
- *Actionable Step*: Use personalised email reminders and special offers for inactive customers to induce repeat buys.

### **3. Recommendations & Business Strategy**

1. Harness High-Value Customers: Use exclusive offers to high-spending customers.
2. Increase Customer Retention: Use loyalty rewards and reactivation campaigns.
3. Improve Seasonal Sales: Use sales promotion during the peak and off-peak periods of transactions.
4. Improve Average Order Value: Implement bundling and tiered pricing.
5. Analyze Product Performance: Monitor demand trends and adjust stock accordingly.

### **4. Conclusion**

This analysis highlights key trends in customer behaviour, seasonal demand, and revenue patterns. With data-driven strategies, the business can increase customer retention, boost sales, and optimize marketing efforts for long-term success.