

# Exploratory Data Analysis (EDA) Report

## Overview

This report summarizes the findings from exploratory data analysis (EDA) on the eCommerce transactions dataset, which consists of three files: Customers.csv, Products.csv, and Transactions.csv. The objective was to derive **actionable business insights** and **visualize trends for decision-making**.

## Dataset Summary

1. **Customers Dataset:** Contains 200 records with details like customer IDs, names, regions, and signup dates.
2. **Products Dataset:** Contains 100 records detailing product IDs, names, categories, and prices.
3. **Transactions Dataset:** Contains 1,000 records of transaction details, including quantities, total values, and dates.

The datasets were merged using common fields (CustomerID and ProductID) to enable comprehensive analysis.

## Key Insights from EDA

1. **Customer Distribution by Region:**
  - **South America** has the highest customer count (304), followed by **North America** (244).
  - **Asia** has the lowest customer count (218).
  - **Insight:** South America is a key market, while Asia has growth potential.
2. **Top 10 Best-Selling Products:**
  - The best-selling product is **ActiveWear Smartwatch** (100 units), followed by **SoundWave Headphones** (97 units).
  - Electronics products dominate the top-seller list.
  - **Insight:** Electronics bring in the most revenue and prove additional marketing efforts put in to achieve the goal.
3. **Total Sales by Category:**
  - **Books** generate the highest revenue (\$192,147), followed by **Electronics** (\$180,783).
  - **Insight:** Books are a key revenue stream, being the biggest source of revenue, but Electronics and Clothing also contribute significantly.

#### 4. Monthly Sales Trends:

- Sales peaked in **September 2024** (\$70,604), followed by **August 2024**.
- Sales dipped in **November 2024** (\$38,224).
- ***Insight:*** Identify drivers behind September's success and develop strategies to boost low-sales months like November.

#### 5. Customer Lifetime Value (CLV):

- **Paul Parsons** is the most valuable customer, contributing \$10,673 in total revenue.
- ***Insight:*** Top customers(like Paul Parsons) should be targeted with **loyalty programs and special benefits** to retain their business, aiding both the parties.

#### 6. Signup Trends:

- The highest number of signups occurred in **September 2024** and **November 2024** (11 each).
- ***Insight:*** Acquisition campaigns and marketing strategies used during these months should be analyzed to replicate success.

#### 7. Regional Behavior:

- **South America** leads in total sales (\$219,352), followed by **Europe** (\$166,254).
- Most popular product categories by region:
  - **Asia:** Clothing
  - **Europe:** Home Decor
  - **North America & South America:** Books
- ***Insight:*** Tailor regional marketing strategies to emphasize preferred product categories according to the region.

### Recommendations

1. Focus marketing efforts in **South America** to capitalize on the large customer base.
2. Expand presence in **Asia**, where growth potential exists.
3. Develop targeted campaigns for **Electronics** and **Books**, the most lucrative product categories.
4. Offer loyalty rewards to top customers like **Paul Parsons** to ensure retention.
5. Investigate factors contributing to September's sales peak and replicate them in other months.

6. Address low sales periods (e.g., November) with promotional offers or discounts.

## **Conclusion**

This analysis highlights key customer behaviors, product performance, and regional trends, providing actionable insights for strategic decision-making. By implementing the above recommendations, the company can optimize revenue and customer engagement.