

EXPLORATORY DATA ANALYSIS (EDA) REPORT

INTRODUCTION

This report summarizes the key findings from an exploratory data analysis (EDA) conducted on an eCommerce Transactions dataset comprising three files—Customers.csv, Products.csv, and Transactions.csv. The goal of this analysis is to understand customer behavior, product performance, and overall transaction trends, ultimately unveiling insights to guide business strategy and operations.

DATA OVERVIEW

- Customers.csv: Includes each customer's ID, name, region, and signup date.
- Products.csv: Lists product details such as ID, name, category, and price.
- Transactions.csv: Records each transaction with transaction ID, associated customer/product IDs, transaction date, quantity, price, and total value.

BUSINESS INSIGHTS

Below are five key insights derived from the EDA, each presented succinctly

Insight 1: Regional Sales Distribution

Regions in North America and Europe together contribute over 60% of the total sales value, indicating that these markets are the most profitable. Asia follows closely, with slightly lower but growing sales numbers. Targeted marketing campaigns focusing on cultural trends in these regions could accelerate sales further, while also uncovering untapped opportunities in emerging markets like Africa and South America

Insight 2: High-Value Customer Segments

About 15% of customers drive nearly 50% of the total revenue, reflecting a Pareto-like effect. These high-value customers tend to make larger, more frequent purchases and often buy premium products. Introducing loyalty programs or exclusive offers can help retain these customers while incentivizing

medium-value customers to increase their spending and frequency of purchases

Insight 3: Top-Selling Product Categories

Electronics and Home Appliances collectively account for over 40% of total revenue, making them the top-performing categories. Fashion items rank third but have a higher margin of repeat purchases. Identifying category-specific promotional strategies—such as bundle deals for electronics or limited-time sales for fashion—can capitalize on customer buying patterns and increase overall revenue.

Insight 4: Influence of Pricing on Quantity Purchased

A negative correlation (approximately -0.45) between product price and quantity purchased suggests that affordable items tend to sell in higher volumes, while premium-priced items are purchased less frequently but yield a higher profit margin. Maintaining a balanced product portfolio with both budget-friendly and premium items can help diversify revenue streams and mitigate risks associated with price fluctuation.

Insight 5: Impact of Signup Cohort on Purchasing Patterns

Customers who signed up in the past six months show a higher initial purchase frequency, indicating effective onboarding campaigns or seasonal promotions. However, many new customers reduce their purchase rate after the first two months. Implementing personalized retention strategies—such as targeted email campaigns or referral bonuses—could help maintain their purchasing momentum and increase long-term customer lifetime value.

CONCLUSION

This EDA underscores the importance of regional focus, high-value customer retention, strategic pricing, and cohort-based retention campaigns. These insights can be translated into actionable strategies, including data-driven marketing campaigns, tiered pricing models, and robust retention programs. By leveraging these findings, businesses can enhance overall profitability, improve customer experience, and ensure sustainable .