Analysis of Online Shopping Patterns and Consumer Behavior in E-commerce

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Abstract. E-commerce growth has led to vast consumer data, offering opportunities to enhance customer experience and retention. This project, "Analysis of Online Shopping Patterns and Consumer Behavior in E-commerce," explores key purchasing trends, product preferences, and churn factors using a public dataset. Through data reprocessing and exploratory analysis, we identify patterns in customer segmentation, payment methods, and retention strategies. Findings provide insights for improving sales forecasting and customer engagement. Despite dataset limitations, the study highlights the impact of data-driven decision-making in e-commerce, with future applications in predictive modeling and recommendation systems for enhanced business strategies.

Keywords: e-commerce · consumer behavior · retail analytics · shopping patterns · data mining

1 Introduction

1.1 Domain and Why?

E-commerce is a rapidly growing industry that generates vast amounts of data from customer interactions. Understanding consumer behavior helps businesses optimize marketing strategies, improve customer experience, and reduce churn.

1.2 Data Sources

Data Source: Public E-Commerce Datasets

Dataset used: E-commerce customer data custom ratios.csv Source: Public domain data sets and Kaggle e-Commerce data sets

1.3 Data Problem and Importance

problem statement. The project aims to analyze customer shopping patterns and churn behavior to identify key factors that influence customer retention and sales trends. This is important globally because: Businesses can predict customer churn and improve engagement. Helps in product recommendation strategies. Optimizes marketing efforts through customer segmentation.

1.4   steps

Planning - Implementation Plan : Data Collection - Import e-Commerce dataset.

Data Cleaning and Reprocessing Handle missing values, duplicates, and normalize data.

Exploratory Data Analysis (EDA) Visualize customer behavior, product preferences, and payment trends.

Churn Prediction Apply machine learning models to identify churn risks.

Results and Insights Summarize findings and provide recommendations.

Reporting and Documentation Prepare final report and visualizations. Future growth - Later, I might add machine learning to suggest products to customers.

1.5   key component and Limitations

key component:
Customer Segmentation: Identifying high-value customers.
Churn Analysis: Analyzing why customers leave.
Sales and Product Analysis: Understanding purchasing trends.
    Limitations:
Data Bias: Dataset might not represent all global e-commerce businesses.
Feature Availability: Limited variables may affect churn prediction accuracy.
Assumptions: Missing customer feedback in the dataset.

2   Titles of Other Potential Sections

2.1   Methodology

2.2   Data Collection

2.3   Data Cleaning

2.4   Feature Engineering

2.5   Exploratory Data Analysis (EDA)

- Customer Demographics
- Product Trends
- Churn Insights

2.6 Results and Analysis

2.7 Limitations

2.8 Conclusion and Future Work

2.9 References

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