E-COMMERCE CONSUMER BEHAVIOR ANALYSIS — PROJECT REPORT

Summary

This project explores the behavior of e-commerce consumers based on various features such as product research time, decision-making speed, frequency of purchases, and brand loyalty.
The main objective is to understand **how customer behaviors influence satisfaction** and provide **strategic recommendations** for improving business outcomes.

Using Python libraries (Pandas, NumPy, Matplotlib), I performed exploratory data analysis (EDA) on real-world customer behavior data.

Dataset Overview

Feature	Description
Age	Customer's age
Frequency_of_Purchase	Number of purchases made
Brand_Loyalty	Loyalty score (1-5)
Product_Rating	Product rating given (1-5)
Time_Spent_on_Product_Research (hours)	Time spent researching products
Return_Rate	Return behavior
Customer_Satisfaction	Overall satisfaction (1-10)
Time_to_Decision	Time taken to decide (in hours)

Source: Kaggle - E-commerce Consumer Behavior Dataset

Analysis & Insights

1. Customer Satisfaction vs Brand Loyalty

- Customers with **Brand Loyalty Score 2** showed **slightly higher satisfaction** than those with the highest loyalty scores.
- **Conclusion:** Loyalty does not always guarantee maximum satisfaction — brands must continue nurturing customer experience.

2. Customer Satisfaction vs Research Time

- Customers who spent **1–1.5 hours** researching products reported the **highest satisfaction**.
- Too little (0–0.5 hr) or too much (>1.5 hr) research led to **moderately lower satisfaction**.
- **Conclusion:** Guided, focused research time results in better customer experiences.

3. Customer Satisfaction vs Frequency of Purchase

- Customers who made **3–4 purchases** showed **peak satisfaction**.
- Beyond 5 purchases, satisfaction remained stable but did not significantly rise.
- **Conclusion:** Building loyalty up to 3–4 purchases is critical for satisfaction.

4. Decision Speed vs Satisfaction (Bonus Insight)

- **Quick decision-makers (≤7 hours)** showed **higher satisfaction** than slow decision-makers.
- **Conclusion:** Confidence during purchase leads to a better experience.

Business Recommendations

1. **Optimize Product Research Experience:**
    - Offer comparison tools, reviews, FAQs to assist customers during 1–1.5 hr research windows.
2. **Encourage Quick Decision-Making:**
    - Implement subtle nudges like “Most Popular Choice” banners or “Low Stock” alerts for hesitant users.
3. **Loyalty Programs:**
    - Introduce rewards for customers making their 3rd or 4th purchase to maximize retention.

4. **Feedback Collection:**
    - Target highly loyal customers with satisfaction surveys to refine brand experiences further.

Tools Used

- Python 3
- Pandas
- NumPy
- Matplotlib
- Jupyter Notebook

Limitations

- The dataset sample size is limited to around 1000 users; larger datasets may provide deeper insights.
- Some behavioral factors (like marketing influence) were not captured.

Future Enhancements

- Perform customer segmentation using clustering techniques (K-means).
- Build predictive models to forecast customer satisfaction based on behaviors.
- Apply real-time customer journey analytics with larger e-commerce datasets.

Conclusion

The EDA successfully revealed how different behavioral aspects impact e-commerce customer satisfaction. The project highlights areas where businesses can intervene to enhance customer experience, encourage loyalty, and optimize sales conversions.
