Project Title: CUSTOMER BEHAVIOR ANALYSIS

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INTRODUCTION

- In today's highly competitive online retail market, understanding customer behavior is crucial for business success. **Shop Easy**, an online retail business, has been facing **a decline in customer engagement and conversion rates** despite increasing investments in marketing campaigns. The company needs **a data-driven approach** to analyze customer interactions, identify key patterns, and improve overall business performance.

- This project focuses on leveraging **SQL and Python** to analyze customer behavior, evaluate marketing effectiveness, and extract actionable insights to optimize engagement and conversion rates.

PROBLEM STATEMENT

Shop Easy is experiencing:

- **Reduced Customer Interactions:** Fewer users engaging with website and marketing content.

- **Decreased Conversion Rates:** Fewer visitors making purchases.

- **High Marketing Expenses:** Increased spending without proportional revenue growth.

- **Customer Feedback Gaps:** Poorly understood customer preferences due to unstructured feedback.

OBJECTIVES

- **Understand Customer Journey Behavior** → Identify bottlenecks in the purchasing process.

- **Analyze Customer Feedback & Reviews** → Find trends in sentiment and satisfaction.

- **Evaluate Marketing Campaign Effectiveness** → Assess impact of marketing on conversions.

- **Product & Demographic Analysis** → Identify high-performing products and key customer segments.

- **Provide Actionable Business Insights** → Help Shop Easy make data-driven decisions.

TOOLS & TECHNOLOGIES USED

TECHNOLOGY	PURPOSE
SQL (MySQL)	Database management, querying
Python (Pandas, SQLAlchemy, MySQL-connector)	Data handling & automation
Jupyter Notebook	Data processing

Data Collection & Preprocessing

Data Sources

- **Customers:** Customer ID, Customer Name, Email, Gender, Age, Geography ID

- **Customer Journey:** Journey ID, Customer ID, Product ID, Visit ID, Stage, Action, Duration.

- **Customer Reviews :** Review ID, Product ID, Customer ID, Sentiment, Review ID, Rating, Review Date.

- **Engagement Data:** Engagement ID, Content ID, Content Type, Likes, Engagement Date, Campaign Date, Product ID, Views Clicks Combined

- **Geography:** Geography ID, Country, City

- **Products:** Product ID, Product Name, Category, Price

Data Preprocessing Steps

- ▶ **Load Data into SQL:** Convert CSV files to SQL tables.

- ▶ **Clean Data:** Handling missing values, remove duplicates.

- ▶ **Transform Data:** Normalizing columns.

- ▶ **Integrate Data:** Performing joins to merge datasets.

CUSTOMER JOURNEY ANALYSIS

Analyzing how customers interact with the website and where they drop off.

- **Finding Drop-off Points:** Identifying where users stop engaging.
  - Identifies customer journey stages and the number of users at each stage.
  - Calculates the drop-off percentage at each stage.
  - Helps in targeting high drop-off points for improvement (e.g., cart abandonment).
- **Common Actions Leading to Purchase:** Analyzing frequent actions of successful buyers.
  - Identifies **high-impact actions** that **increase purchase likelihood**.
  - Helps in optimizing engagement strategies.
  - Provides insights into which marketing efforts **drive real sales**.
- **Average Time Spent in Each Stage:** Identifying slow points in the journey.
  - Accurate Stage-Wise Customer Time Spent
  - Better Customer Behavior Analysis
  - Detect Drop-Off Points

CUSTOMER REVIEWS SENTIMENT ANALYSIS

▶ Identifying **highest-rated and lowest-rated products**

    ▶ Ranks products based on average rating.

    ▶ Includes review count to avoid bias from fewer reviews.

    ▶ Can be filtered for products with at least a certain number of reviews.

▶ Sentiment analysis.

    ▶ Converts raw text into structured sentiment scores.

    ▶ Identifies reviews as Positive, Neutral, or Negative.

    ▶ Can be extended with machine learning for deeper insights.

▶ Correlate review trends with product performance.

    ▶ **Finds the relationship between review sentiment and product sales.**

    ▶ **Products with more positive reviews tend to have more purchases.**

    ▶ **Negative reviews may correlate with fewer engagements or abandoned carts.**

MARKETING EFFECTIVENESS ANALYSIS

▶ **Comparing Customer Retention vs. New Customers**

  ▶ **If repeat buyers are significantly higher, it means customers are coming back, which is a good sign.**

  ▶ **If there are more first-time buyers than repeat buyers, the company may need to improve retention strategies, such as personalized offers or loyalty programs.**

▶ **Best-Performing Products per Region**

  ▶ **Products with consistently high engagement across multiple countries might be global best-sellers.**

  ▶ **If a product is only popular in one region, it indicates that regional trends, cultural preferences, or marketing strategies influence demand.**

▶ **Measure Impact of Marketing Campaigns on Conversions**

  ▶ **If a high-engagement product has low conversions, the issue could be pricing, customer trust, or checkout friction.**

  ▶ **The company can focus targeted promotions or discounts for high-engagement regions.**

BUSINESS RECOMMENDATIONS

Based on the insights from SQL and Python analysis:

▶ **Improve Website Navigation:** Reduce drop-offs by optimizing user experience.

▶ **Enhance Product Listings:** Highlight best-reviewed products.

▶ **Refine Marketing Campaigns:** Invest more in high-converting channels.

▶ **Personalized Recommendations:** Use purchase history to suggest relevant products.

CONCLUSION

Key Insights:

► Customer sentiment analysis revealed specific product issues driving negative reviews and dissatisfaction.

► Low repeat purchase rates indicate gaps in customer experience and product quality, requiring improvements.

► Regional engagement trends highlight best-performing products and opportunities for market expansion.

► Marketing effectiveness evaluation shows that while engagement is high in some areas, conversion rates need optimization.

Recommended Next Steps:

► Enhance product quality and resolve key complaints from negative reviews.

► Implement targeted loyalty programs to improve repeat purchase rates.

► Optimize marketing strategies based on regional product demand to maximize ROI.

► Leverage customer feedback insights to refine product offerings and enhance overall experience.