ZBIGNIEW WIERCINSKI
DATA ANALYST

Zbigniew Wierciński

Data Analyst portfolio

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INSTACART

Instacart is an online grocery store that operates through a mobile app, offering customers the convenience of shopping from home. This project analyzes its sales data to uncover customer purchasing patterns, supporting a targeted marketing strategy.

Objectives

- Determine peak and low-order periods to enhance ad scheduling and optimise product marketing strategies.
- Examine customer purchasing behavior, including loyalty, demographics, and regional variations, to refine targeted marketing efforts.

Data

Customer dataset from CareerFoundry

Instacart online shopping dataset from 2017

Methods

- Python
- Data wrangling & subsetting
- Data merging & variable derivation
- Data grouping & aggregation
- Data visualization using Python

Process

Step 1: Data Preparation

- Performed data cleaning and validation to address missing values and inconsistencies.
- Merged multiple datasets from Instacart's 2017 sales data into one comprehensive dataset.
- Derived additional variables necessary for deeper analysis.

Step 2: Exploratory Data Analysis (EDA)

- Used Python (pandas, seaborn, matplotlib) to analyze data patterns.
- Investigated purchasing trends across different times, regions, and customer segments.

Step 3: Analysis of Customer Segmentation

- Segmented customers based on spending frequency and loyalty.
- Identified purchasing behavior within segments to propose targeted marketing strategies.

Challenges and Solutions

Challenge 1: Handling Large and Complex Data

- Encountered difficulty managing the large dataset (over 30 million rows).
- **Solution:** Optimized Python scripts for RAM efficiency, ensuring faster data processing and analysis.

Challenge 2: Limited Dataset

- Lack of quantity data limited the depth of certain analyses.
- **Solution:** Analyzed available data by frequency of orders and product popularity rather than exact quantities.

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Results

Peak Purchasing Hours

- Most orders were placed between 10 AM and 4 PM.
- High-value, less frequent purchases were noted between 2 AM and 6 AM.

Customer Segments

- Regular customers (~98%) dominated the user base, with loyal engaged shoppers providing significant growth opportunities.

Regional Analysis

- Minimal variation was observed in purchasing behavior across different regions, suggesting uniform marketing strategies would be effective.

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Recommendations & Reflections

Ad Timing: Schedule promotions between 8-10 AM, just before peak purchasing hours.

Loyalty Programs: Implement tiered loyalty programs to convert regular shoppers into loyal customers.

Product Promotion: Highlight popular product categories prominently to maximize revenue.

This project significantly developed my skills in data preparation, visualization, and strategic recommendation formulation. It underscored the importance of robust data cleaning and showed the limitations of working with incomplete datasets. Future analyses could greatly benefit from more detailed demographic and quantity data.

Supporting Visuals

Spending Patterns by Hour

Customer Loyalty Segmentation

Regional Spending Habits