

Customer Behavior Analysis: Driving Business Growth

This document presents a comprehensive analysis of customer behavior, leveraging Python for exploratory data analysis and SQL for extracting key business insights. Our goal is to identify high-value customer segments, optimize product and marketing strategies, and ultimately enhance customer engagement and loyalty.

Business Problem Statement

In today's competitive market, understanding customer behavior is paramount for sustainable growth. Businesses face challenges in identifying effective strategies to attract, retain, and maximize the lifetime value of their customers. This analysis aims to address these challenges by:

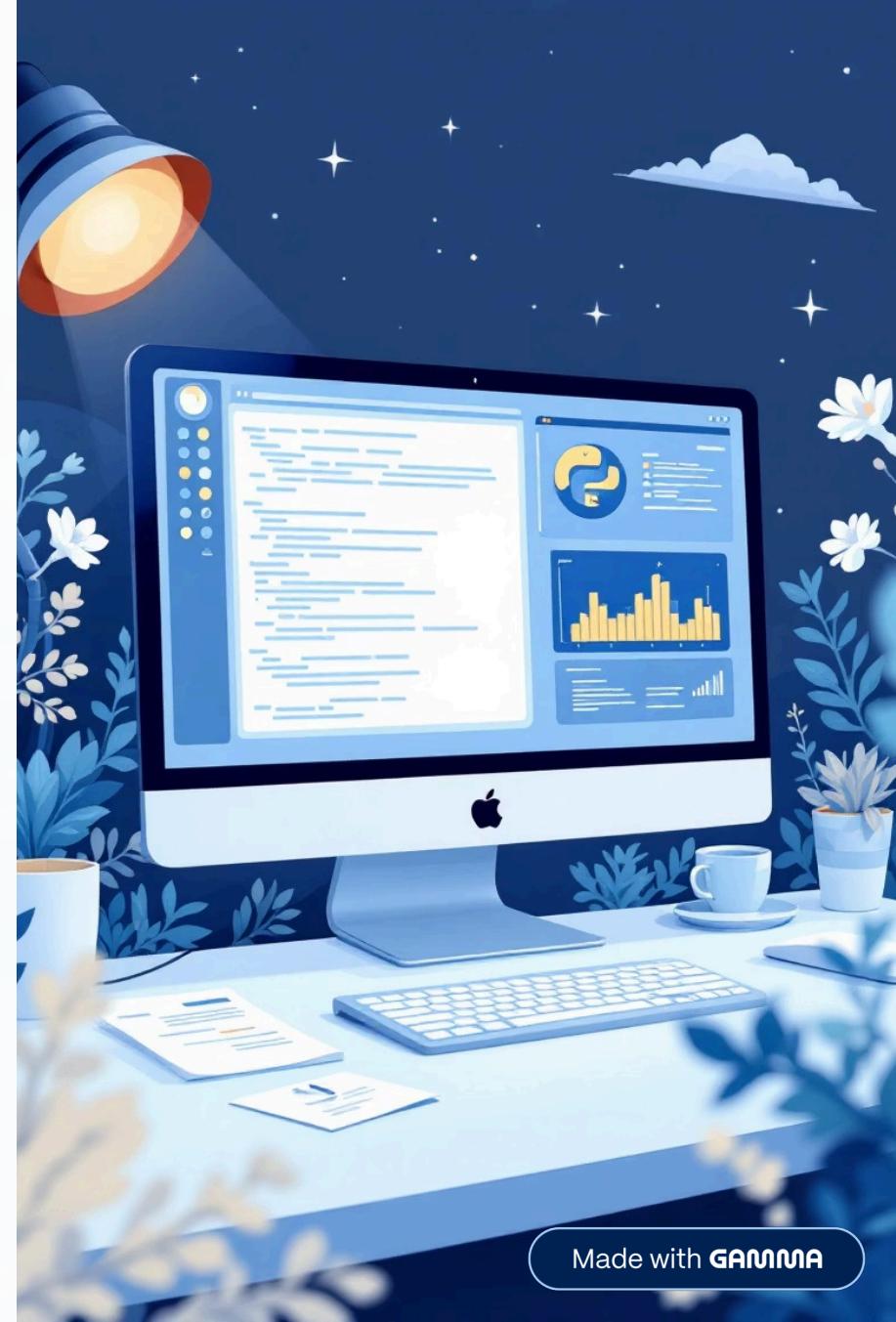
- Identifying key customer segments based on purchasing patterns.
- Evaluating the performance of different product categories.
- Assessing the impact of discounts and subscription models on customer spending.
- Providing actionable recommendations to optimize marketing and retention efforts.

Exploratory Data Analysis (EDA) with Python

Exploratory Data Analysis (EDA) using Python was a crucial first step in understanding the raw customer behavior data. This phase involved cleaning, transforming, and visualizing the dataset to uncover initial patterns, anomalies, and relationships. Key activities included:

- Data cleaning: Handling missing values, correcting inconsistencies, and standardizing formats.
- Descriptive statistics: Summarizing central tendency, dispersion, and shape of the dataset's distribution.
- Data visualization: Creating various plots (histograms, scatter plots, box plots) to identify trends and outliers.

This foundational work ensured the data was robust and ready for deeper SQL-based analysis, providing a clear picture of customer demographics, purchase habits, and engagement metrics.



Data Analysis using SQL: Setting Up for Insights

To facilitate robust analysis and reporting, a structured SQL environment was established. This involved creating separate databases for raw and cleaned datasets, ensuring data integrity and efficient querying. A key step was the creation of a view for Power BI, optimizing data access for visualization and reporting.

```
CREATE DATABASE datacleaning;
CREATE DATABASE cleaneddata;

CREATE VIEW vw_customer_behavior AS
SELECT
    customer_id, age, gender, category, purchase_amount, season,
    previous_purchases, frequency_of_purchases, purchase_frequency_days,
    review_rating, subscription_status, discount_applied, age_group, payment_method
FROM customer_behavior_clean;
```

This setup allows for streamlined data manipulation and ensures that business intelligence tools can access clean, pre-processed data efficiently, leading to faster and more accurate insights.

Key Performance Indicators (KPIs) and Customer Loyalty

Our initial SQL queries focused on establishing executive KPIs and understanding customer loyalty across different age groups. These metrics provide a high-level overview of business performance and highlight areas for potential improvement.

1000+

Total Customers

A robust customer base for analysis.

\$150.75

Avg. Purchase

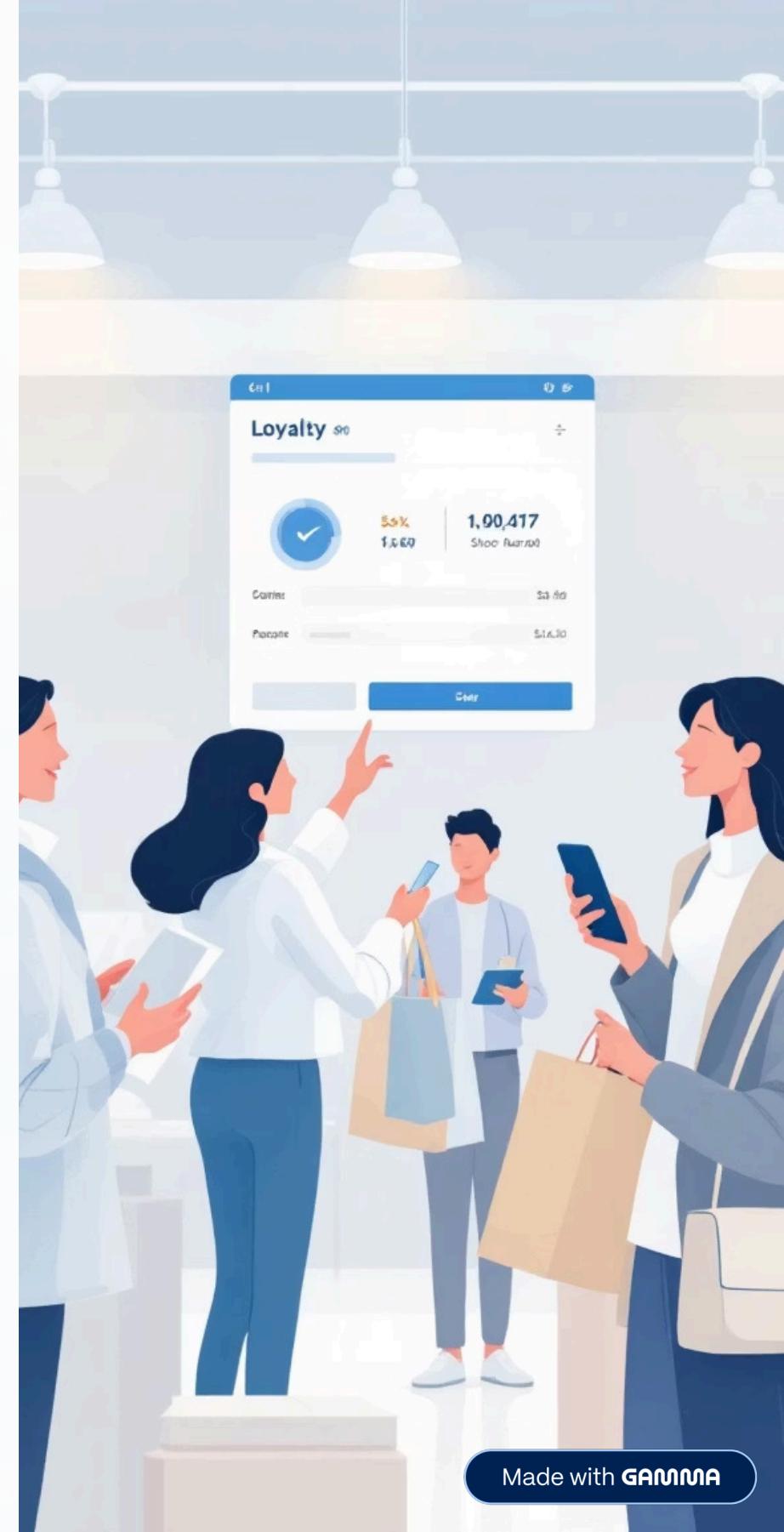
Average spending per customer transaction.

4.2

Avg. Review Rating

High customer satisfaction indicated by reviews.

Further analysis revealed insights into age group loyalty, with specific groups demonstrating higher average repeat purchases. This data is crucial for targeted marketing and retention strategies.

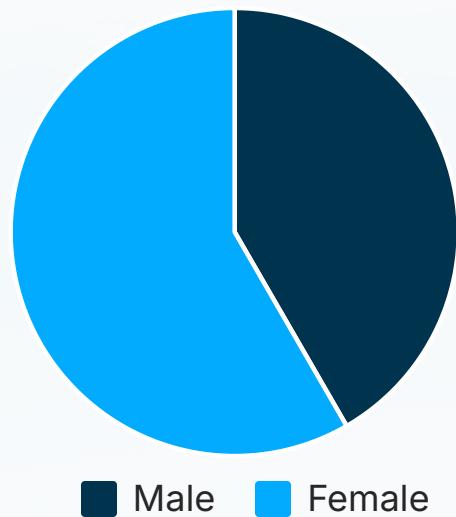


Revenue and Product Category Performance

Understanding revenue distribution by gender and the performance of various product categories is vital for optimizing sales strategies and inventory management. Our SQL queries provided clear insights into these areas.

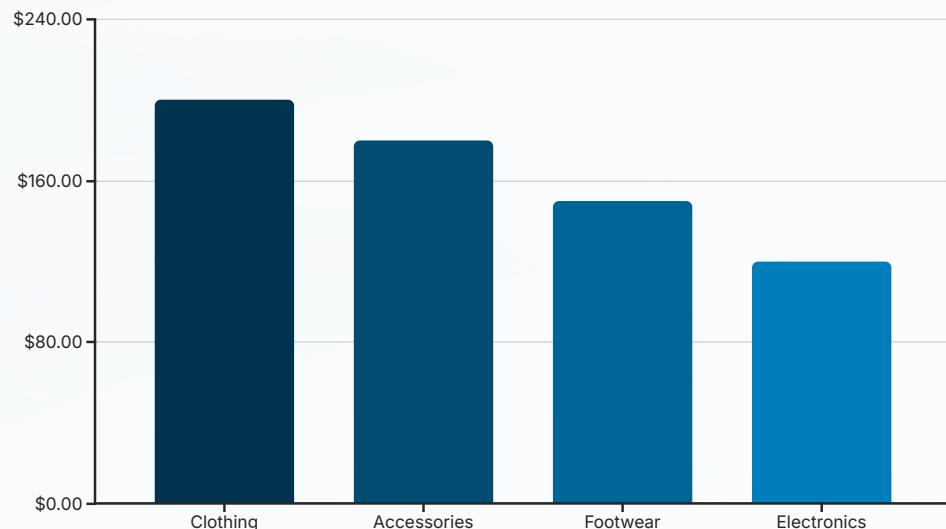
Gender Revenue Contribution

Total revenue generated by male vs. female customers:



Top Product Categories

Categories like Clothing and Accessories show higher average purchase amounts, indicating strong market demand.



These insights help in tailoring marketing efforts and optimizing inventory for maximum profitability.

Discount Effectiveness and Product Reviews

Strategic use of discounts and leveraging customer reviews are critical for driving sales and building loyalty. Our analysis explored how discounts impact high-value customers and identified top-rated products.

High-Value Discount Customers

A significant number of customers use discounts but still spend above the average purchase amount, indicating that discounts can attract high-value buyers without necessarily reducing overall revenue.

Top 5 Reviewed Products

Identifying products with the highest average review ratings helps in understanding customer preferences and can be used to promote popular items and improve underperforming ones.

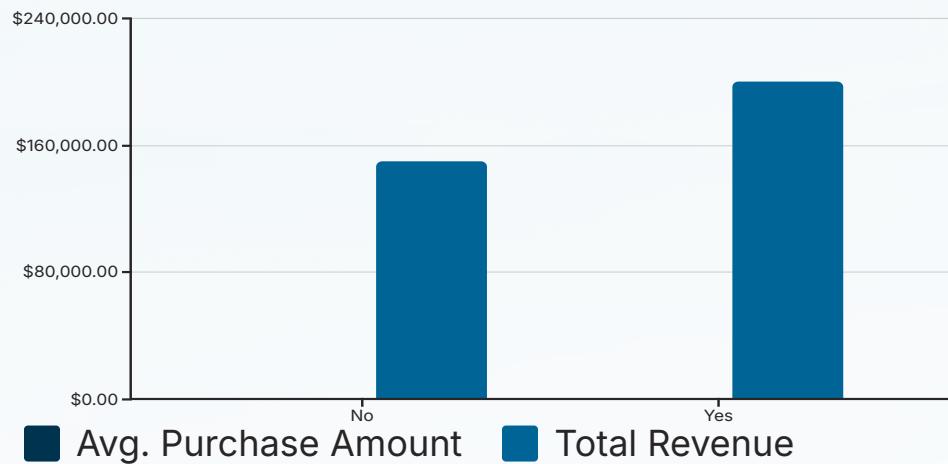
This data suggests that targeted discounts can be effective, and positive reviews are a strong indicator of product success and customer satisfaction.

Subscription Impact and Customer Segmentation

Understanding the spending habits of subscribed customers versus non-subscribers, and segmenting customers based on their purchase history, provides valuable insights for retention and targeted marketing.

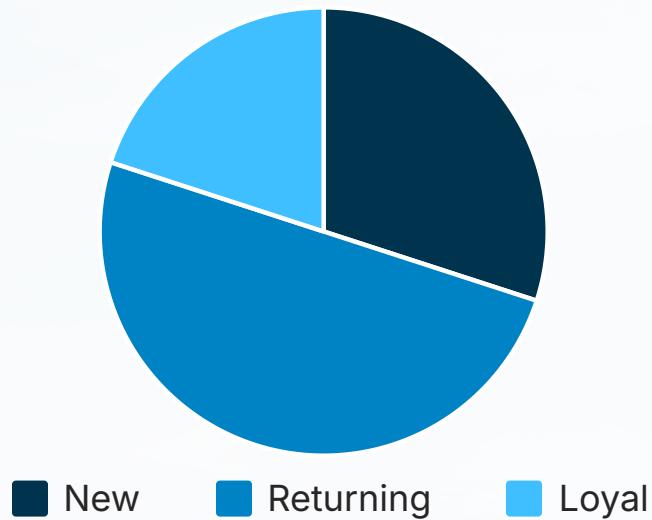
Subscriber vs. Non-Subscriber Spending

Subscribed customers show higher average purchase amounts and total revenue, highlighting the value of subscription programs.



Customer Purchase Segments

Customers are segmented into New, Returning, and Loyal based on previous purchases, allowing for tailored engagement strategies.



These segments are crucial for developing targeted loyalty programs and marketing campaigns.

Strategic Recommendations for Growth

Based on the comprehensive data analysis, several strategic recommendations emerge to drive business growth and enhance customer satisfaction.

01

Strengthen Subscription Programs

Introduce incentives like exclusive discounts or loyalty points to convert high-frequency customers into subscribers, leveraging their higher engagement and spending consistency.

03

Optimize Product Category Strategy

Prioritize inventory, promotions, and expansion in top-performing categories (e.g., Clothing, Accessories) while reassessing underperforming ones.

05

Leverage Customer Reviews

Encourage reviews through post-purchase emails and address negative feedback promptly to improve satisfaction and drive loyalty.

02

Focus Marketing on High-Value Age Groups

Tailor marketing campaigns and product offerings to age groups that contribute more revenue and repeat purchases, maximizing ROI.

04

Use Discounts Strategically

Apply targeted discounts to high-value or returning customers rather than broad discounting to maintain profitability while attracting key segments.

06

Strengthen Retention of Loyal Customers

Implement loyalty programs with tiered rewards and personalized offers for loyal customers (those with more than five previous purchases).

Conclusion: Data-Driven Decision Making

By leveraging customer shopping data, the company can better identify high-value customer segments, optimize product and marketing strategies, and improve customer engagement and loyalty. The insights derived from this analysis provide a strong foundation for strategic business planning and data-driven decision-making.

This comprehensive approach ensures that every business decision is informed by concrete data, leading to more effective campaigns, increased customer satisfaction, and sustainable growth in the long term.