

Customer Insights: Purchase Behavior Analysis

This project analyzed 3,900 customer purchases across 18 data points. The goal was to identify key spending patterns and optimize customer segmentation to drive business value.



Dataset Summary

Data Volume

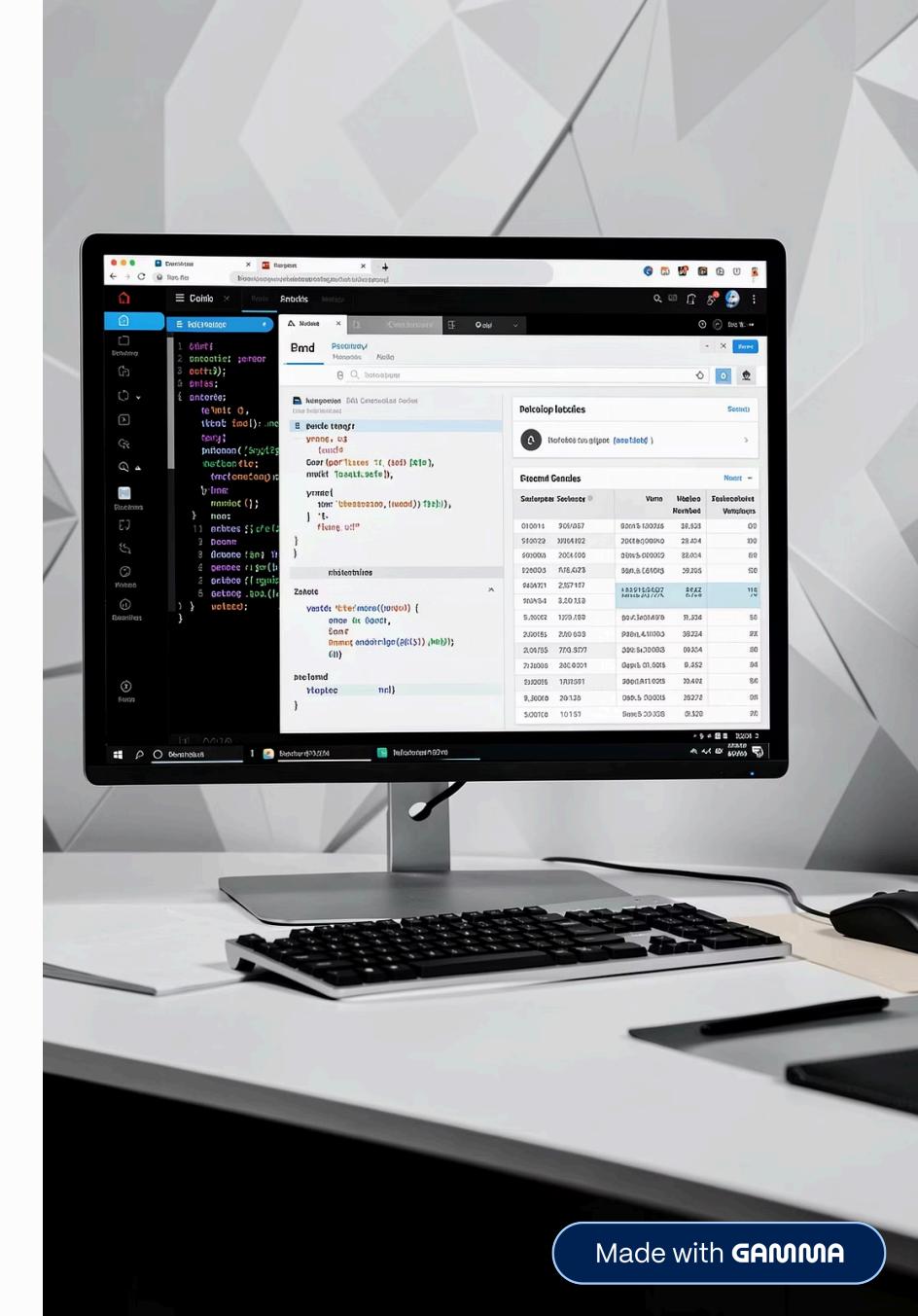
Dataset
comprises 3,900
rows and 18
columns.

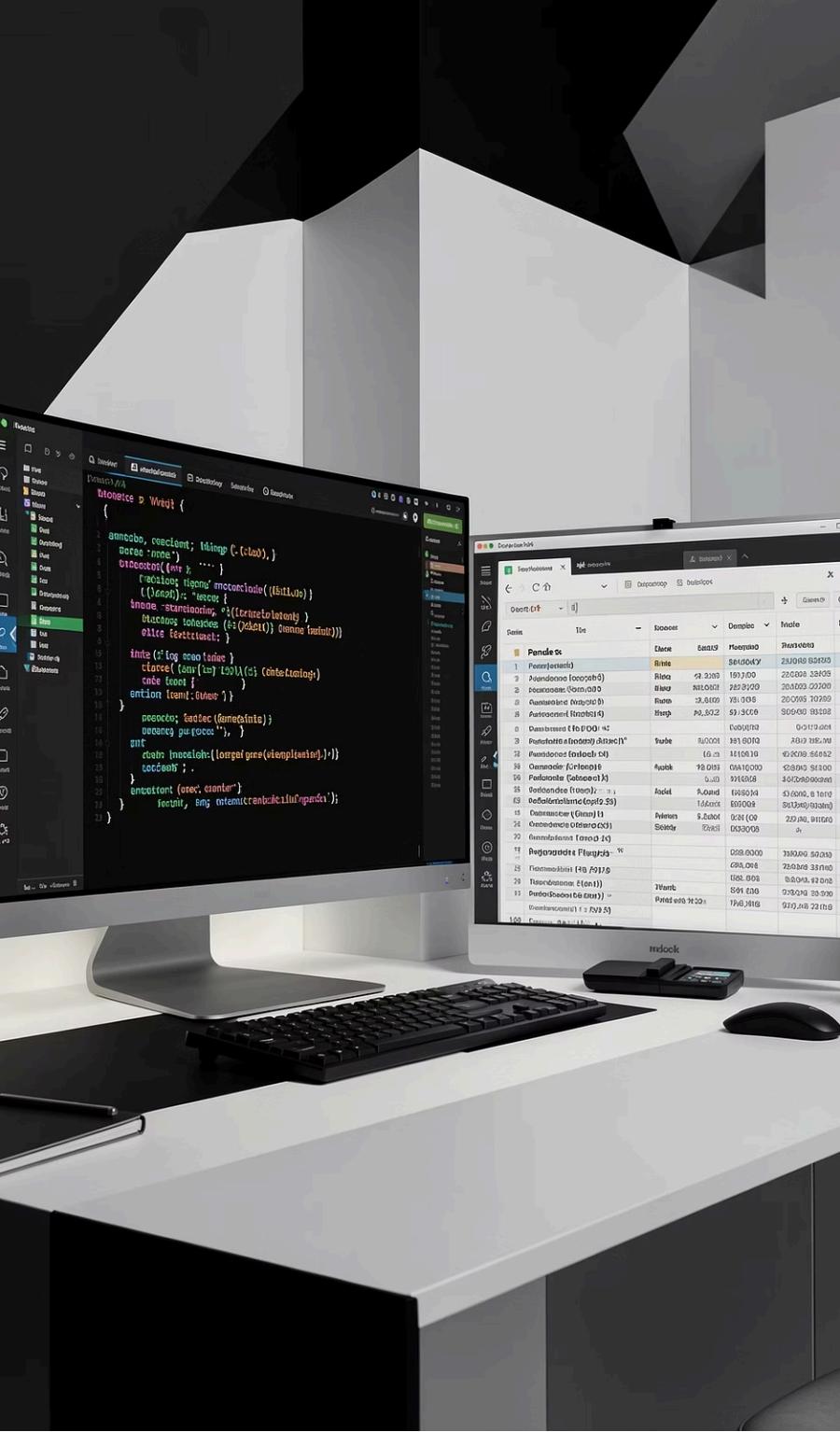
Key Features

Includes
customer
demographics,
purchase
specifics, and
behavioral
metrics.

Data Quality

Only 37 missing
values, all in the
'Review Rating'
field.





EDA – Python Workflow

Initial Data Assessment

We loaded and inspected the raw data to understand its structure and initial statistics.

Data Preprocessing & Imputation

Missing values in 'Review Rating' were filled using median imputation to maintain data integrity.

Feature Engineering

New features like 'age_group' and 'purchase_frequency_days' were created to enhance analysis.

Data Standardization

Column names were standardized to snake_case for consistency and easier use.



Database Integration

The cleaned and validated DataFrame was integrated into MySQL, establishing a production-ready foundation for advanced analytical queries and reporting. The `promo_code_used` column was dropped due to redundancy and to enhance data integrity and query performance.

Revenue by Gender

Revenue by gender was compared to identify patterns. This insight helps inform targeted marketing strategies.

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High-Value Discount Seekers: A Key Opportunity



We've identified a valuable customer segment: those who actively seek discounts yet consistently demonstrate high average transaction values. This group presents significant untapped potential. By understanding their motivations, we can target them with personalized premium offers, driving loyalty and unlocking substantial new revenue.

Key Product Insights



Top Rated Products

We identify the top 5 products based on customer reviews to guide product development and marketing.



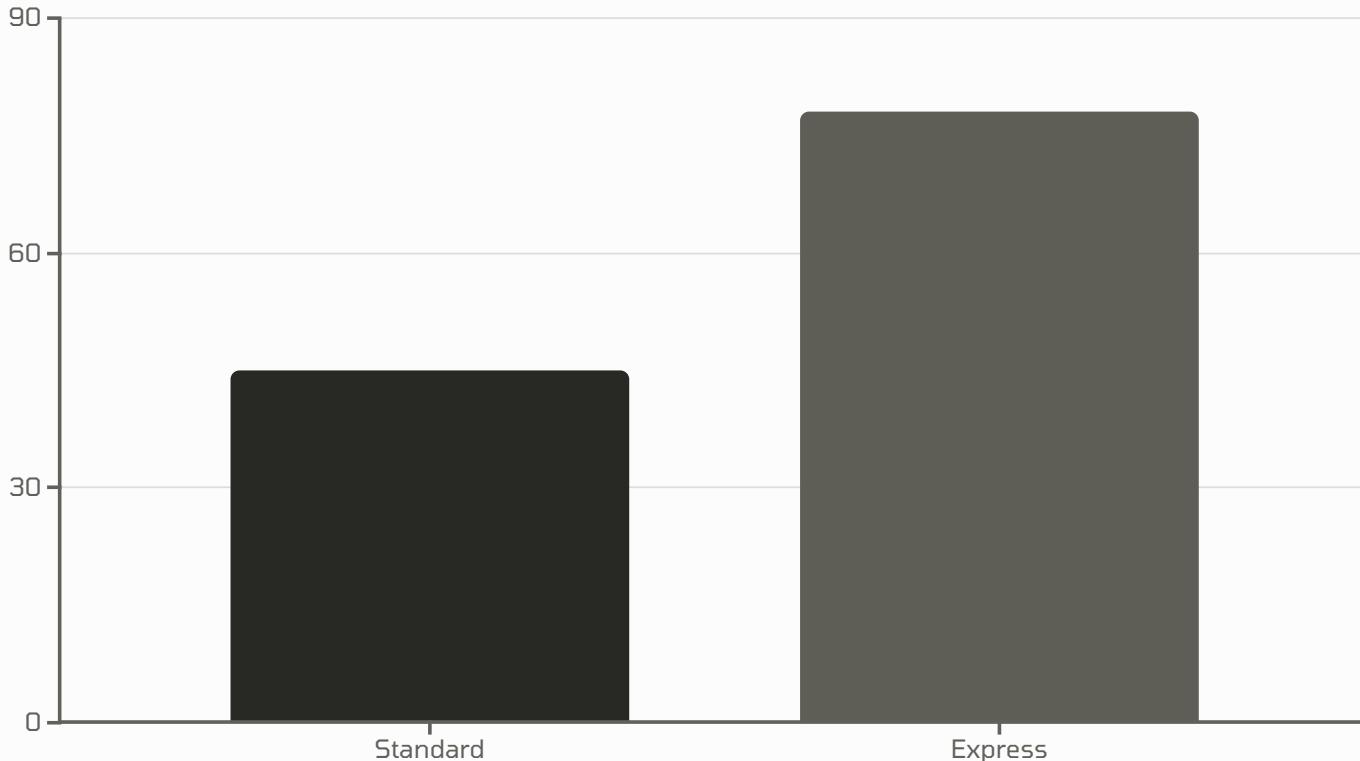
Discount-Dependent Products

We analyze the top 5 products most frequently purchased with discounts to optimize promotions and pricing.



Best Sellers

We identify the top 3 best-selling products in each category for better inventory and merchandising decisions.

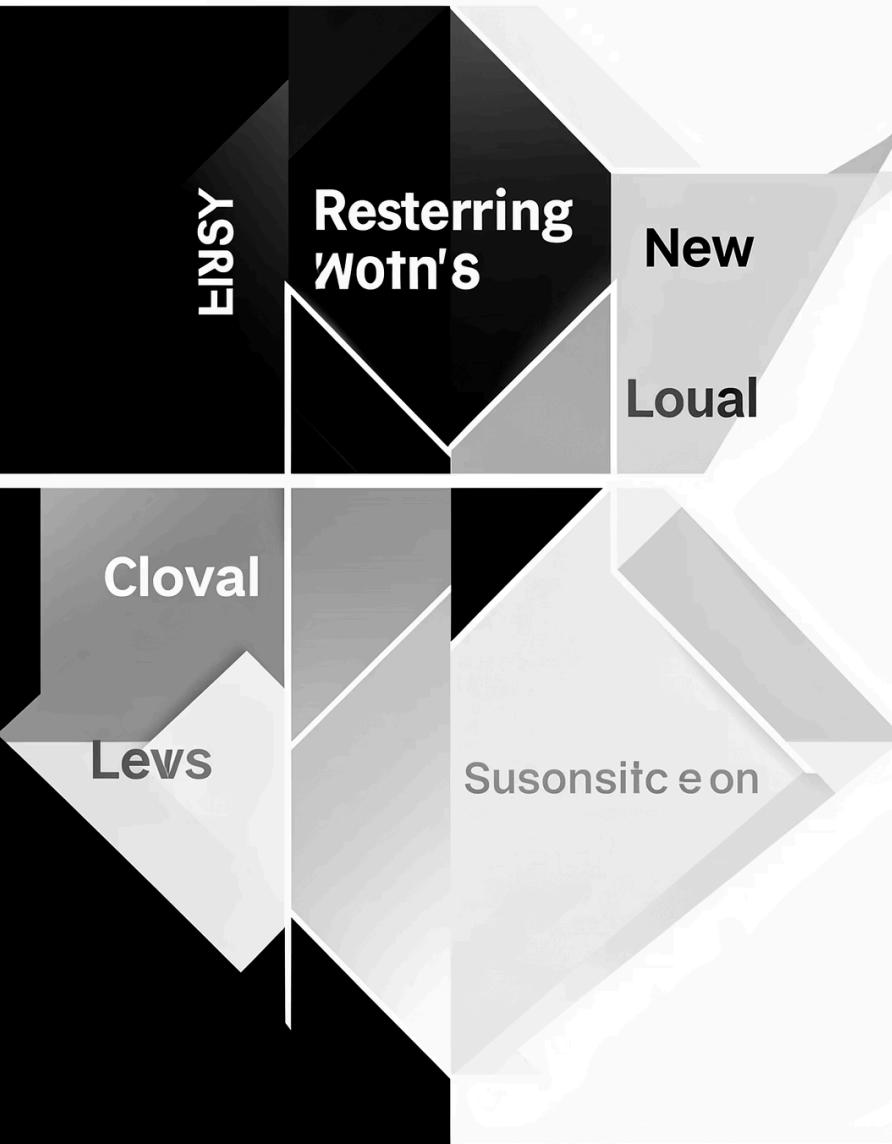


Unlocking Customer Value

Customers choosing Express shipping spend significantly more, with an average purchase value of \$78 compared to \$45 for Standard shipping. This indicates that Express customers are a high-value segment, prioritizing speed and convenience.

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Customer Segmentation

New Customers

First-time buyers are targeted with acquisition and onboarding strategies.

Returning Customers

Customers with 2-5 purchases, focus on fostering repeat purchases and cross-selling.

Loyal Customers

Customers with 5+ purchases and higher subscription rates, offered premium offerings and exclusive benefits.

Project Approach: STAR Method



SITUATION

Analyzed 3,900 customer purchases to understand spending patterns and identify high-value segments



TASK

Uncover actionable insights on customer behavior, product performance, and revenue drivers to inform marketing strategy



ACTION

Cleaned and engineered data in Python, loaded into MySQL, analyzed revenue by demographics, shipping preferences, and discount usage patterns



RESULT

Identified 3 customer segments and high-spending discount users; revealed Express shipping customers spend 73% more; provided 5 strategic recommendations

Recommendations

Optimize Subscription Value Proposition

Promote exclusive benefits and tiered offerings to enhance subscriber engagement, driving predictable recurring revenue growth and improving customer lifetime value.

Implement Data-Driven Loyalty Frameworks

Design and execute advanced loyalty programs that reward repeat purchases, utilizing customer behavior analytics to maximize retention and increase customer advocacy, thereby boosting long-term ROI.

Strategic Discount Policy Re-evaluation

Conduct a comprehensive analysis of discount effectiveness, balancing promotional appeal with profit margin protection to optimize sales volume and ensure sustainable profitability.

Amplify High-Performance Product Positioning

Strategically highlight top-rated and best-selling items across all marketing channels to capitalize on proven market demand, reinforcing brand leadership and accelerating sales velocity.

Refine Precision-Targeted Marketing Campaigns

Leverage granular customer data to focus marketing efforts on high-revenue demographic segments and users prioritizing premium services, ensuring maximum marketing efficiency and conversion rates.