



User Behavior Analysis





Project Overview

Objective



This analysis aims to understand user behavior, focusing on transaction patterns (spending behavior) and credit risk. With proper user segmentation, the company can identify

- High-value users
- Potential risk groups
- Spending patterns

Data Source



- Card Data
- User Data
- Transactions Data

Methodology

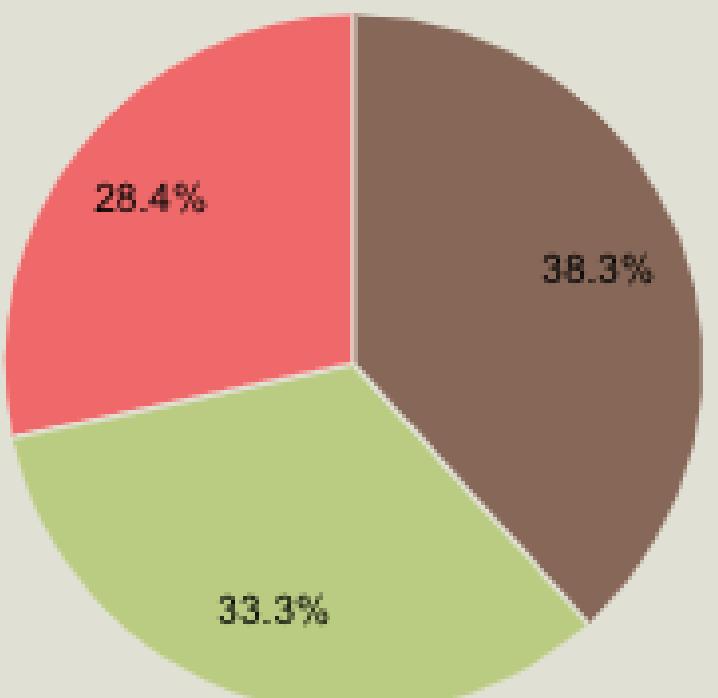


1. BigQuery → Data storage, cleaning, and preprocessing
2. Clustering (Python) → to segment users based on their spending behavior and credit risk.
3. Interactive Dashboard (Looker) → to visualize insights in a concise and interactive way, making them easily accessible for stakeholders.



User Segmentation

Spending Share by Cluster



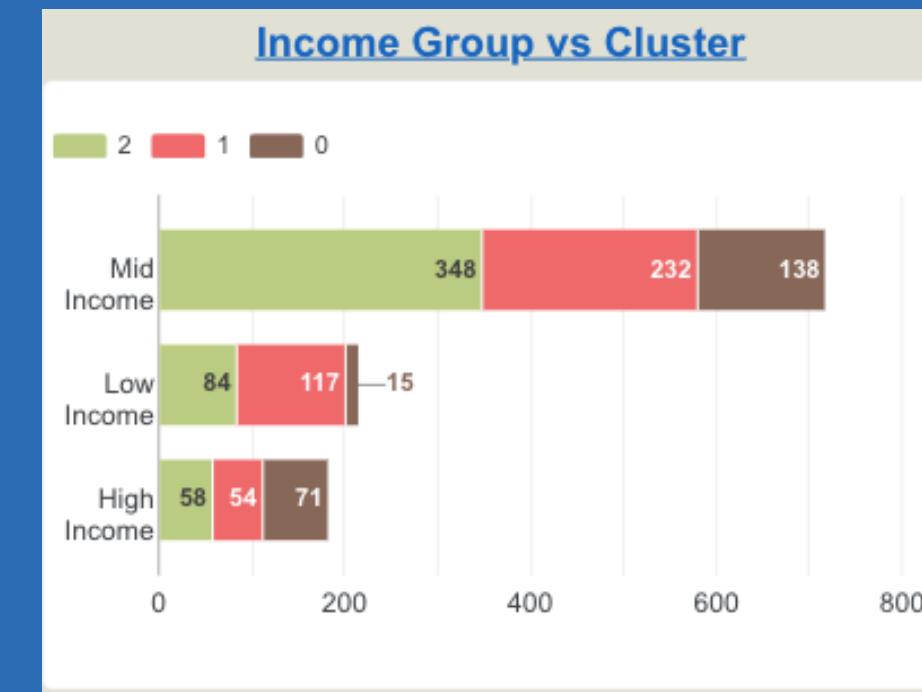
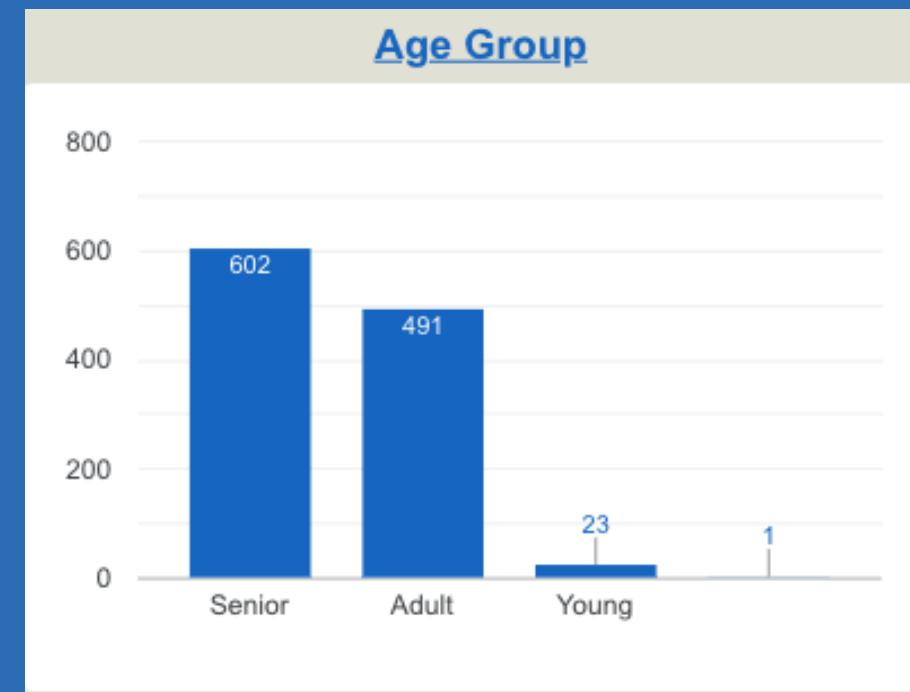
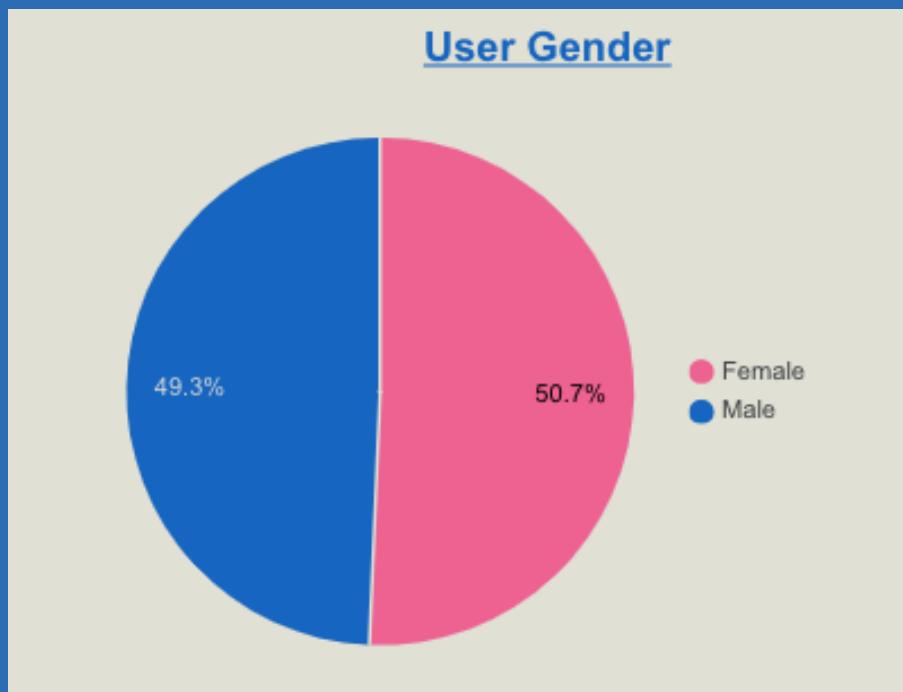
Cluster Profiles				
Cluster	Avg Transactions	Debt to Income Ratio	Utilization Rate	Total Spent *
0	11,934.45	265.37	660.82	9,539,121.66
2	23,348.67	928.32	3,466.67	8,302,558.3
1	16,597.09	198.28	162,842.96	7,069,433.08

Key Findings

- Cluster 0 → High-Value Users**
 - Largest spending share (38.3%) with the highest total spent (\$9.5M).
 - Average transactions are relatively high.
 - Moderate debt-to-income and utilization (**core valuable user segment**).
- Cluster 2 → Stable Users**
 - 33.3% spending share, total spent \$7.1M.
 - Lowest debt-to-income (198.28) → healthier from a credit risk perspective.
 - Fewer transactions compared to Cluster 0 (**stable but lower-value users**).
- Cluster 1 → Risky Users**
 - Smallest spending share (28.4%), total spent \$8.3M.
 - Extremely high utilization rate (3,466.67) and highest debt-to-income (928.32).
 - Indicates high credit risk, likely users with small credit limits but high spending (**requires closer monitoring**).



User Demographics



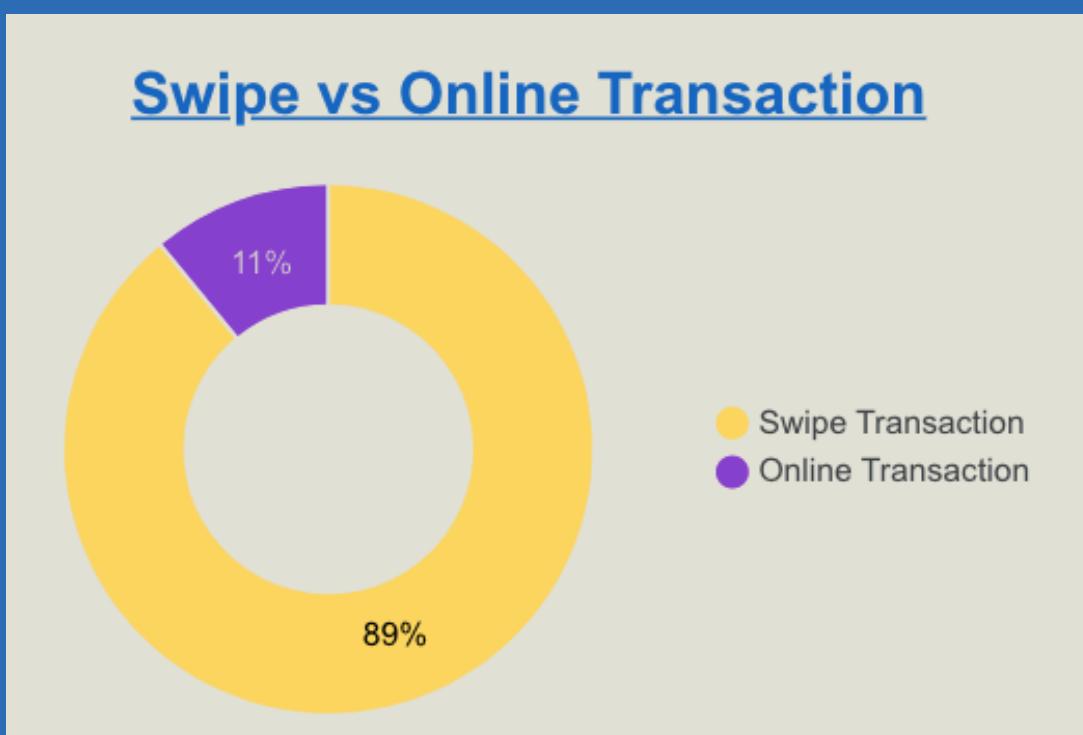
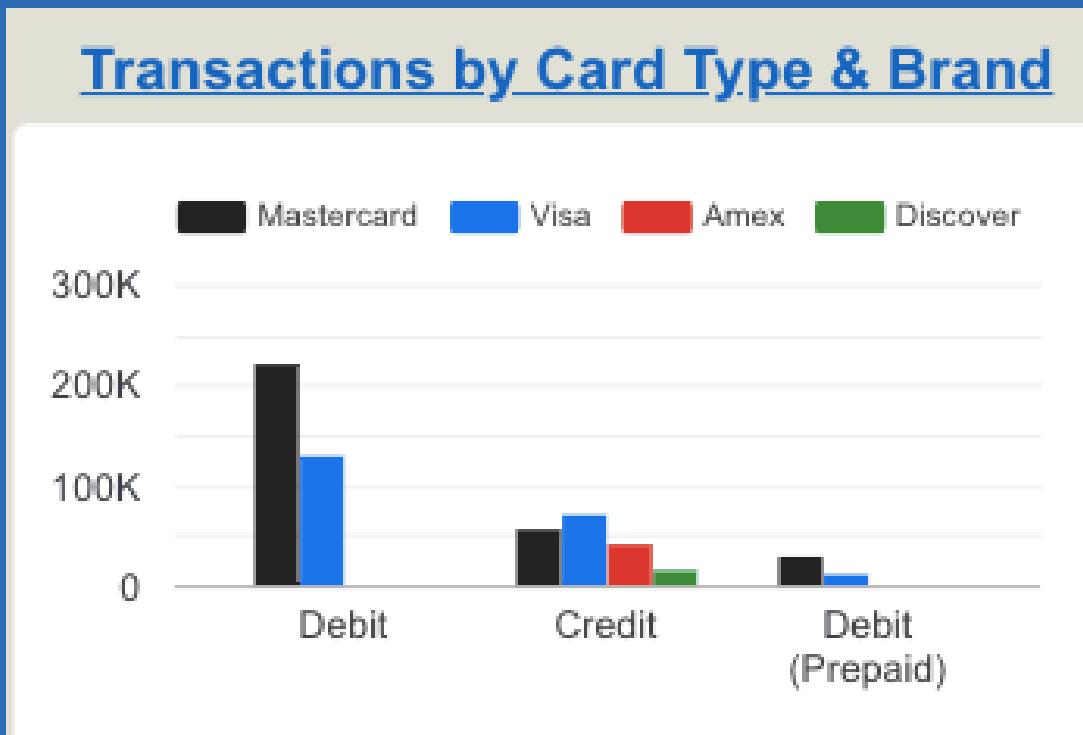
- Fairly balanced: **50.7% female vs 49.3% male.**
- No strong gender skew → both groups are equally relevant for targeting.

- **Seniors (602)** form the largest group, followed by **Adults (491)**.
- Very few **Young users (23)** and almost no representation in the youngest segment → the user base is **dominated by older demographics.**

- **Mid-Income users dominate across all clusters** (majority in Cluster 2 and Cluster 1).
- **Low-Income users** are concentrated in Cluster 1 (high-risk segment) → aligns with higher debt-to-income ratio and utilization risk.
- **High-Income users** are relatively few but more evenly distributed across clusters, including Cluster 0 (high-value).



Card & Chanel Performance



1. Card Type & Brand Performance

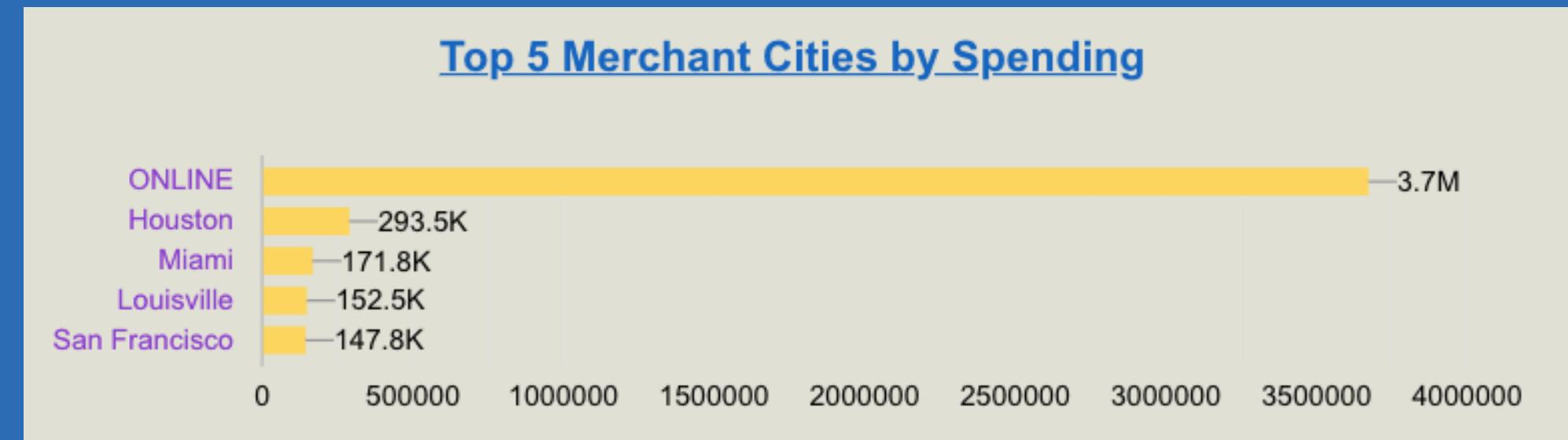
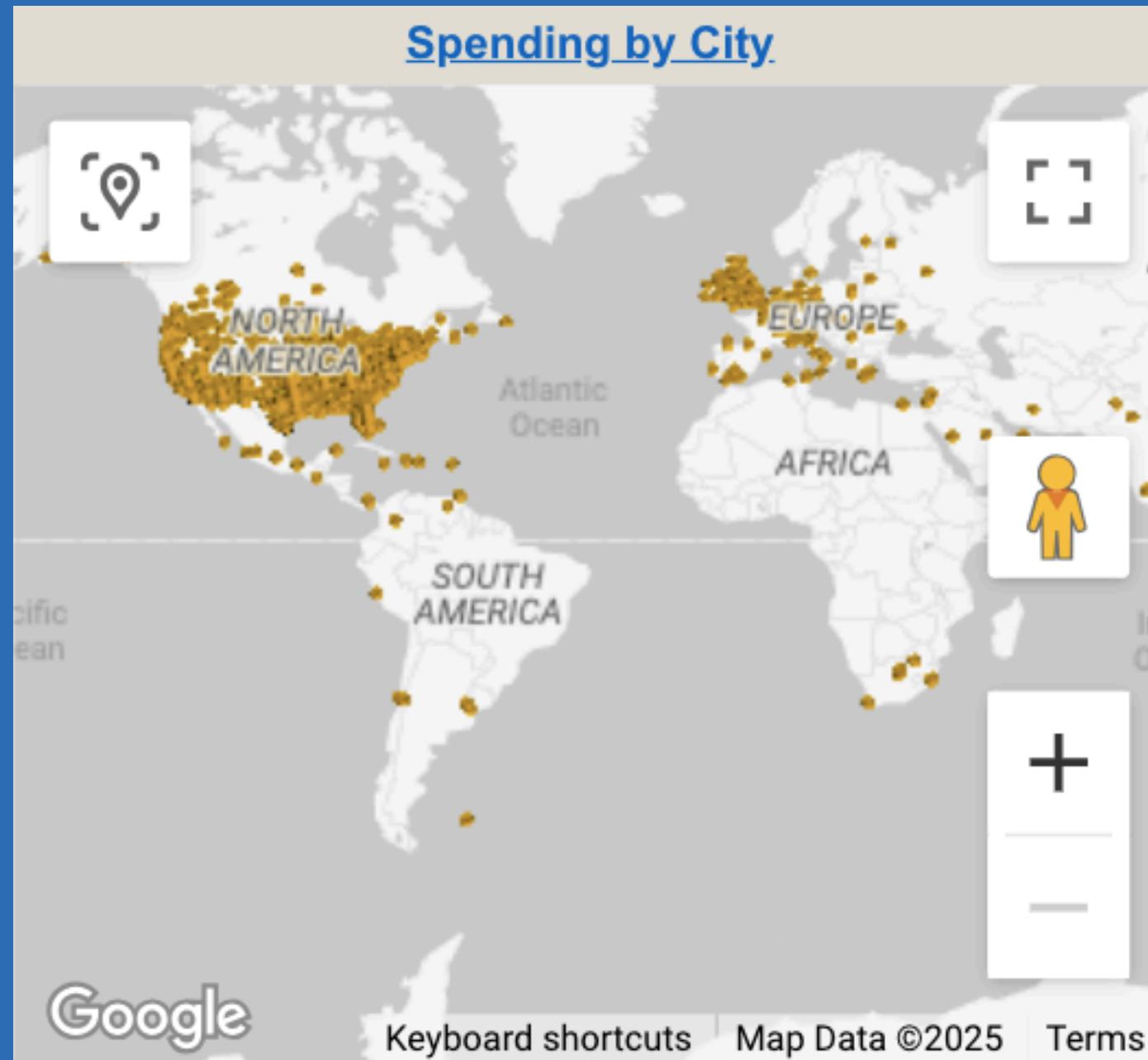
- Debit cards dominate transaction volume, especially Mastercard (\$220.7K) and Visa (\$128.5K).
- Credit card transactions are much lower, with Visa (\$68.5K) leading, followed by Mastercard (\$58.5K) and Amex (\$40.4K).
- Prepaid debit cards have the least usage across all brands (<30K each), showing limited adoption.

2. Transaction Channels

- Swipe (offline) transactions dominate with 89%, while online transactions only account for 11%.
- Indicates strong reliance on physical card usage, suggesting digital adoption is still relatively low.



Merchant & Location



Online Spending Dominates

- Online transactions contribute massively with \$3.7M spending, far surpassing any physical city.
- This confirms the growing importance of digital/online merchants compared to offline spending.

Top Merchant Cities

- Among offline locations, Houston (\$293.5K) is the leading city, followed by Miami (\$171.8K), Louisville (\$152.5K), and San Francisco (\$147.8K).
- However, all of these cities combined still account for less than \$1M, which is only 25% of online spending.

Geographical Distribution

- Spending is concentrated in the United States, with limited visible activity in other regions on the map.
- Suggests that the merchant network and customer base are highly US-centric.



Recommendations





Card & Channel Strategy



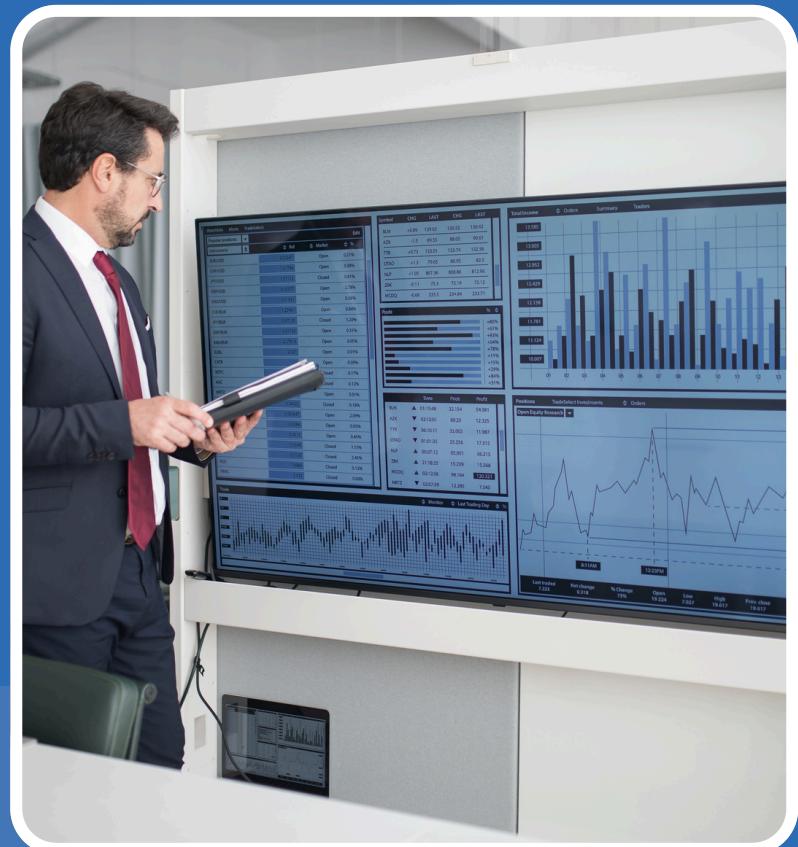
Card Type

Debit (Mastercard & Visa dominant)

Remains the backbone, but steer customers toward credit cards for higher revenue per transaction.

Credit (Visa & Amex strong)

Promote credit rewards & installment plans to grow volume.



Channel

- Aggressively expand e-commerce & fintech partnerships.
- Push digital adoption (referrals, waived fees, notifications) to boost online usage.



Cluster Strategy



Cluster 0 (High-Income, Smaller Base)

- Prioritize premium services & exclusive offers (VIP access, travel perks).
- Use personalized experiences to maximize Customer Lifetime Value (CLV).

Cluster 1 (Mixed Income, Moderate Base)

- Launch targeted promotions (cashback, installment plans) to drive engagement.
- Suitable for cross-sell campaigns due to diverse income profiles.

Cluster 2 (Mid-Income, Large Base)

- Focus on retention & upselling through loyalty programs or bundled offers.
- Encourage migration to credit card usage to increase average spending.



Location Expansion



Strengthen integration with global platforms (Amazon, Shopify, travel sites)

Explore Tier-2 U.S. markets (Atlanta, Dallas, Chicago) to diversify beyond coastal hubs

Top Cities for Offline Growth

- Houston : Ideal for piloting loyalty programs.
- Miami & San Francisco : High potential due to tourism & international business.
- Louisville : Niche merchant opportunity worth targeting.



Appendix

[Python](#)

[Dashboard](#)

[Github](#)

[Deck](#)





Thank You!

No Handphone

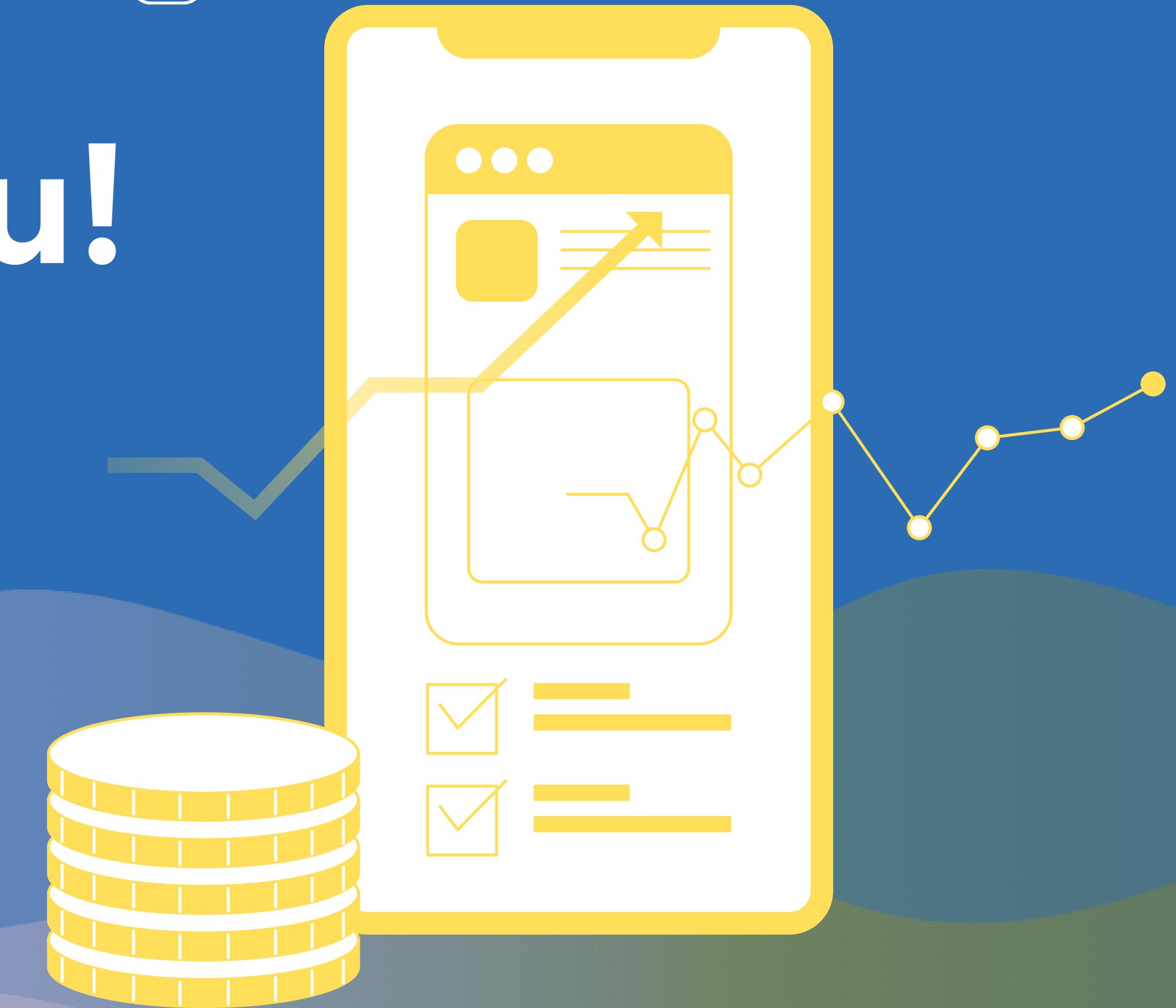
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Customer Segmentation & Spending Insights Dashboard

Gender ▾

Total Users
1,117

State ▾

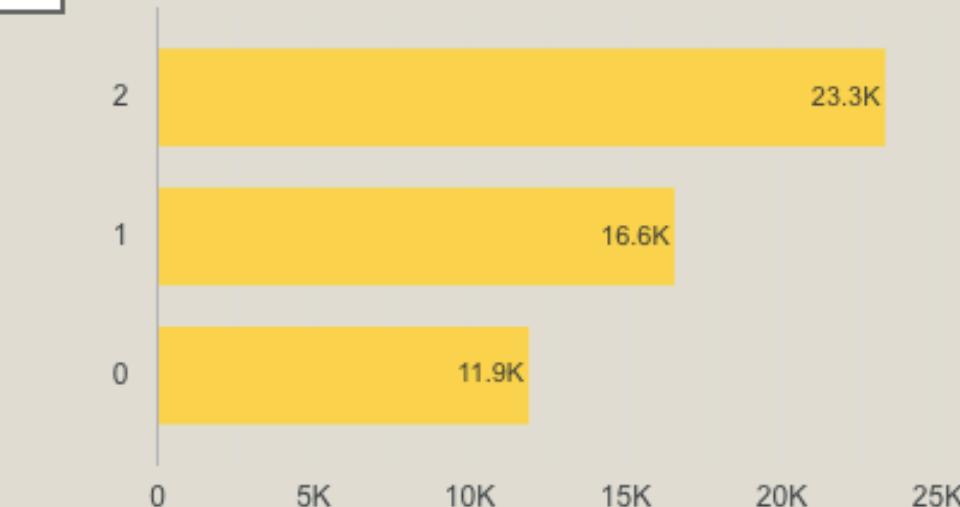
Avg Spending per User
22,301.8

Card Brand ▾

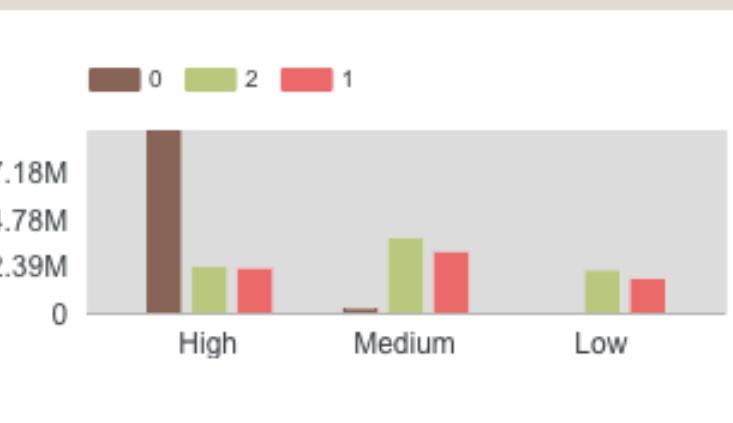
Total Transactions
567,856

Total Spent
24,911,113.04

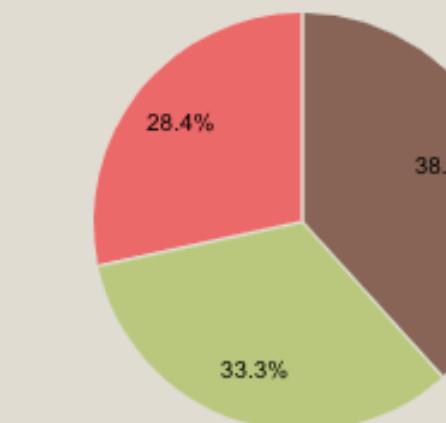
Average Transactions per User by Cluster



Spending Behavior by User Cluster

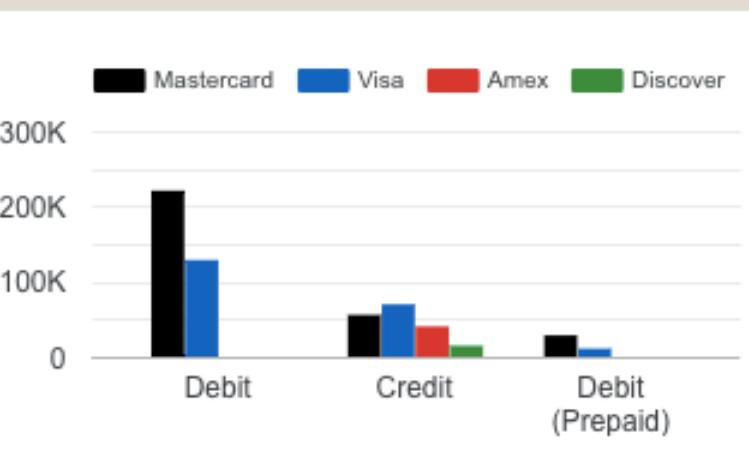


Spending Share by Cluster

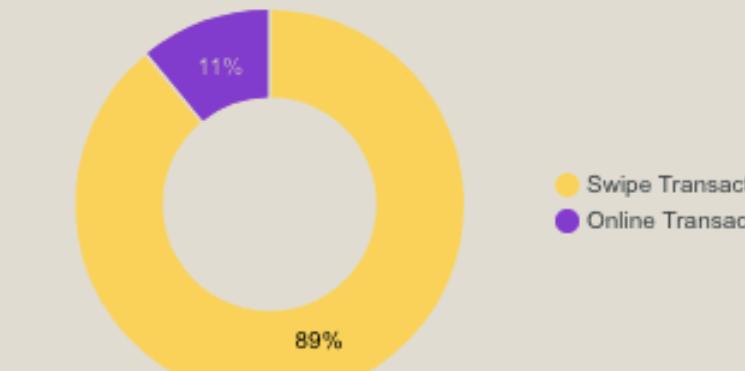


Cluster 0: High-Value Users
Cluster 1: Risky Segment
Cluster 2: Medium Segment

Transactions by Card Type & Brand



Swipe vs Online Transaction



Top 5 Merchant Cities by Spending

