

Executive Summary for TravelTide Customer Segmentation

Introduction

In today's competitive travel landscape, understanding customers isn't just an advantage—it's essential. As TravelTide seeks to improve customer retention, this analysis focuses on behavior only segmentation of customers to power a targeted rewards program. Demographics are strategically excluded—both in modeling and interpretation—to keep actions grounded in behavior and value.

Objectives

- To identify distinct customer segments within TravelTide's user base.
- Produce interpretable, action-ready segments sized for campaign execution (no micro-segments).
- Boost retention and engagement via a personalized rewards program aligned to real behavior.

Methodology

The analysis was conducted using Colab Notebooks with Python for data manipulation and SQL for initial data extraction. The data was sourced from the TravelTide database. CRISP-DM (Cross-Industry Standard Process for Data Mining) framework, an industry-standard methodology ensuring a structured, iterative, and business-focused approach was adopted.

CRISP-DM Summary

- Business Understanding: Validate whether predefined perks map meaningfully to actual behaviors; introduce new perks if data warrants.
- Data Understanding: Consolidated Users, Sessions, Flights, and Hotels; retained cancellations/rebooks for behavioral signals.
- Data Preparation: Fixed negative hotel nights (timestamp swaps), de-duplicated sessions, corrected discount anomalies, and capped outliers.
- Feature Engineering: Trip counts, booking type ratios (co-booking, flight-only, hotel-only), rebooking/cancel rates, engagement, money spent on flights & hotels.
- Modeling: PCA (~95% variance) + K-Means (k-means++), evaluated by inertia (elbow), silhouette, and business interpretability.
- Evaluation & Deployment: Selected k=7 (silhouette ≈ 0.36) with balanced cluster sizes.

Key Findings

Deal-Seeking Co-Bookers (Users: 1,394 | 23.24%) — Perk: Exclusive Discounts

This segment stands for its price consciousness with an average spend of \$585 on hotels - about (~80% lower than High-Spend Hotel-Focused and \$757 spent on flights (~56% lower than Loyal High-Value). High co-booking of 0.87 suggests bundle-seeking at lower spend.

Summary: Deal-sensitive co-bookers: value-seeking behavior with strong cross-sell patterns. Therefore, Exclusive Discounts on either hotel or flight bookings will certainly be attractive to such price-conscious customers.

Inactive / Idle Users (Users: 458 | 7.64%) — Perk: Free Hotel Meal (reactivation)

This segment of customers are just browsers as they never booked either a flight or a hotel. They are very dormant users and need an immediate reactivation.

Summary: Truly idle audience: needs low-friction, high-visibility offers to trigger first conversion. A Free Hotel Meal is ideal for grabbing the customer's attention. It is also cost-effective and easy to implement for TravelTide.

Affluent Hotel Travelers (Users: 898 | 14.97%) — Perk: Complimentary Daily Breakfast

This segment spends the most on hotels (\$2924) and stay 5 nights or longer. In contrast, they spend the least on flights (\$582). Also they tend to stay in luxury hotels with a high spend of \$482 per night per room. Therefore, a perk which is more relevant to hotel bookings and which foster the customer's loyalty makes an ideal choice for this segment.

Summary: Premium hotel value: luxury hotels, relative longer stays. Hence, Daily Complimentary Breakfast is certainly attractive for the customers in this segment. It is also operationally easy for TravelTide to implement this perk.

Leisure Hotel-Only Vacationers (Users: 363 | 6.05%) — Perk: Free Mid-Stay Housekeeping

These are the users who book only hotels and stays the longest (over 7 nights) among all the other segments. They also book more rooms on an average (1.34), the second largest among all the segments. The money spent on a room per night \$221 is the lowest, meaning they book budget friendly-hotels. It is clear that a hotel-relevant perk which values their longer stays will be the most attractive to them.

Summary: Hotel-only leisure: Budget-friendly hotels, long stays and occasional multi-room bookings. A Free Mid-Stay Housekeeping offered will be a definite attraction to such leisure vacationers as most of the budget hotels charge for housekeeping services.

Rebooking-Prone Fliers (Users: 139 | 2.32%) — Perk: No Cancellation Fees

With 139 travelers, this segment includes travelers with the highest rebooking ratio (0.66). That is the users cancel and rebook 66% of their trips. Also, it can be observed that they end up in rebooking only flights and cancel all hotels they booked earlier. A perk which gives them flexibility to cancel and encourage them to rebook a trip will be attractive to these users.

Summary: Flight-only and change-heavy: flexibility removes friction and protects conversion. Therefore, offering No Cancellation Fees to customers who tend to cancel and rebook, will certainly encourage them to rebook all their cancelled trips. It is also operationally easy for TravelTide to implement this perk.

Loyal High-Value Travelers (Users: 2,039 | 33.99%) — Perk: 1 Night Free Hotel + Flight

With 2039 users, this is the largest segment amongst all. They travel the most (over 4 trips on an average) and book both the flights and hotels equally (co-booking ratio of 0.91). They spend the most on flights (\$1716) and live in the most luxurious hotels (\$674 dollars per night per room). Therefore, the users in this segment are the most loyal and valuable ones with a balanced booking behavior. To foster their loyalty and total value an anchor perk is most suitable.

Summary: High-value frequent travelers: premium co-bookers who merit an anchor perk. A 1 Night Free Hotel + Flight offer recognizes loyalty, drives incremental trips, and strengthens flight-hotel co-booking among our top customers.

Stable Frequent Fliers (Users: 707 | 11.79%) — Perk: Free Checked Bag

The users in this segment spends high on flights (\$1,598 second most, next to Loyal High-Value). They also have a healthy co-booking ratio of 0.89 and high amount of checked bags (0.61 on an average). They are stable travelers with lower rebooking/cancelation (0.07). A highest room count (1.75 on an average) suggests larger parties; a baggage-focused perk aligns directly with observed behavior.

Summary: Reliable frequent fliers: consistent travel and baggage usage. A Free Checked Bag perks fit directly.

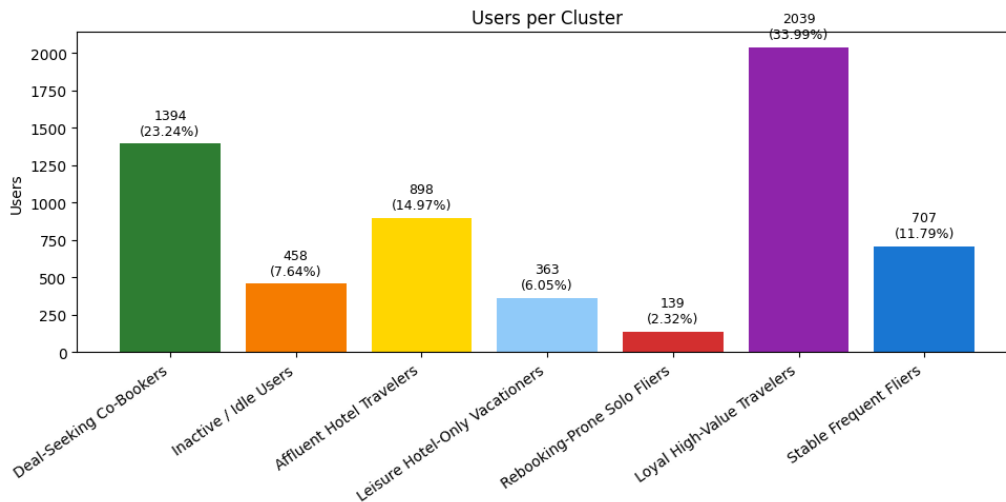


Figure 1: Number of Users by Segment

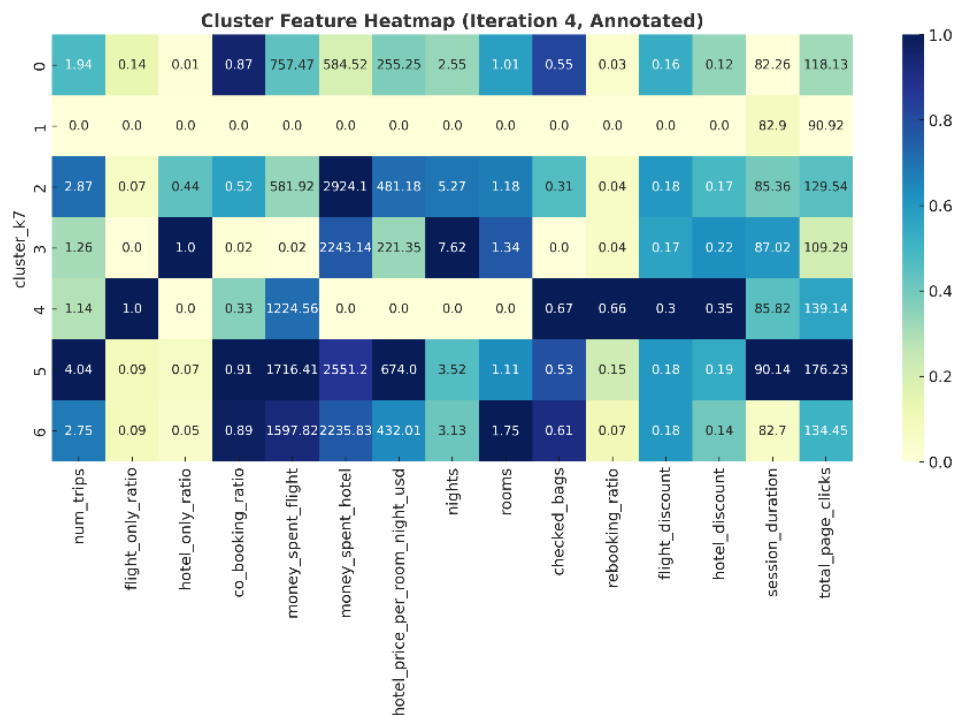


Figure 2: Cluster-Feature Heatmap

Recommendations

Perk Activation & Measurement Plan

- Run simple A/B tests by segment (perk vs control) for 4–6 weeks, to validate the effectiveness of targeted perks for each segment.
- Prioritize: High-value segments (Loyal High-Value; High-Spend Hotel-Focused) and run reactivation for Idle Users.

- Success = retention/lapsed-winback, trips per user, co-booking rate, and net revenue (with margin guardrails).

Deployment & Operations

- Targeting: use the behavior segments in CRM; start with email + in-app; 1–2 touches per 14 days (frequency cap).
- Offer hygiene: one active offer per user; no stacking; cap perk cost by segment.
- Scale rule: promote winners to full segment once lift is proven; pause weak cells.

Resources & Risks

- Owners: Marketing (CRM/creative), Data (experiment readouts), Eng (audiences/tracking), Finance (unit economics).
- Guardrails: protect margin, watch for cannibalization and refund spikes; add basic fraud checks (one redemption/user).

Continuous Monitoring

Regular monitoring and reporting of KPIs will be essential for the ongoing optimization of the rewards program.