

Executive Summary

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TravelTide — Customer Segmentation for a Personalized Rewards Program

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Objective

Design a data-driven rewards strategy to boost engagement and retention by segmenting customers based on behavior and matching each segment to a motivating perk.

Data & Cohort

- Source: TravelTide production-like PostgreSQL (users, sessions, flights, hotels).
- Filters: users with > 7 sessions; activity after Jan 4, 2023.
- Final user-level dataset: 5,998 users with 21 engineered features.

Method

- Engineered features across engagement, conversion, spend, distance, luggage, timing, and loyalty.
- Standardized features and tested multiple clustering approaches (K-Means, GMM, DBSCAN) and 300+ variants.
- Final model: K-Means with $k=6$; silhouette score ≈ 0.474 (best balance of separation + business clarity).
- Assigned human-readable segment names and mapped a single primary perk to each segment.

Segments & Perks ($k=6$)

0. Premium Frequent Travelers (26.9%) → 1 Free Hotel Night with Flight
1. Change-Prone Travelers (7.1%) → Free Cancellation
2. Window Shoppers (9.6%) → First-Booking Discount
3. Hotel Loyalists (6.3%) → Extended Stay Discounts
4. Serial Cancellers (1.7%) → "Travel or Credit" (cancel → credit)
5. Balanced Frequent Travelers (48.6%) → Free Checked Bag + Hotel Upgrade

Why it Matters

- Protects core revenue: perks tailored to premium and balanced frequent travelers reinforce loyalty.
- Activates low-value segments: discounts/credit nudge first conversions and reduce churn after cancellations.
- Partner alignment: hotel-focused offers deepen supplier relationships without over-subsidizing flights.
- Measurable impact: clear A/B test metrics and audience definitions enable rapid iteration.

Key Next Steps

- 1) Launch targeted campaigns by cluster with the mapped perk.
- 2) Track success metrics: lift in conversion, cancellation reduction, repeat-booking rate, ARPU, email engagement.
- 3) Improve data quality around cancellation sessions; expand coverage with more recent data and seasonality.
- 4) Explore a supervised model for perk recommendation once labeled outcomes accumulate.