

Final Report

TravelTide: Retain & Reward

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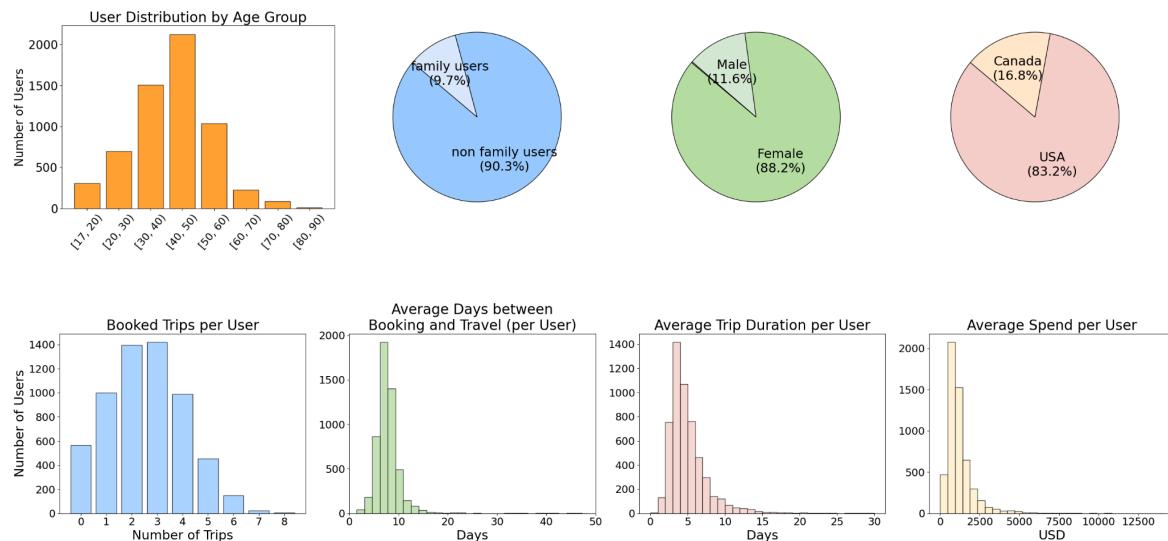
Introduction and Objectives

TravelTide is an AI-powered travel platform with a strong value proposition driven by a large inventory and advanced search capabilities. While effective at attracting users, the platform faces challenges in customer retention, with many booking only sporadically. This project supports the design of a personalized rewards program by analyzing user behavior, segmenting customers based on meaningful patterns, and aligning perks with these segments to increase engagement and repeat bookings.

Methodology

The analysis was conducted in Databricks using session and user-level data filtered to post 01/01/2023 activity. After data preprocessing and exploratory analysis, two complementary segmentation approaches were applied: a behavior-based segmentation focused on booking and travel patterns, and an RFM segmentation capturing user value and engagement. Perks were then defined based on observed user behavior rather than predefined assumptions, ensuring alignment between segments and reward design.

Getting to Know Our Customers



User Demographic Profile

The age distribution is concentrated between 30 and 60 years old, with a peak in the 40–50 age group, while younger and older users are less represented. Most users are non-family travelers, the majority are female, and the user base is predominantly located in the United States.

Number of Booked Trips

Most users have between 1 and 4 bookings, with a peak around 2–3 trips. Users with more than 5 bookings are rare, while a non-negligible share has zero bookings. This indicates that the platform mainly serves occasional or moderately recurrent users, with only a small group of highly frequent travelers.

Average Days between Booking and Travel

The distribution is strongly right-skewed, with most users booking 6–10 days before departure and a small minority planning several weeks in advance.

Average Trip Duration

Average trip length is concentrated between 3 and 6 days, peaking around 4–5 days, with longer trips forming a long right tail. Short to medium-length stays dominate, while long trips are relatively uncommon.

Average Spend

User spending is highly right-skewed: most users spend relatively little, while a small group shows very high average spending. This implies a largely budget- to mid-range customer base, with a limited number of high-value users contributing disproportionately.

Segmentation Framework

To capture user heterogeneity, we used two complementary segmentation approaches. **Booking and Travel Behaviour** focuses on engagement and booking patterns (trip frequency, timing, and length), while **RFM** evaluates overall value and engagement over time (recency, frequency, monetary).

The segmentations are combined to create a more granular view of users, enabling targeted assignment of rewards and perks.

Booking and Travel Behaviour Segmentation

The “Booking and Travel Behaviour segmentation” divides users based on engagement, booking timing, and trip length.

First, users are split by engagement:

- Low-Engagement users (≤ 2 trips)
- Regular users (≥ 3 days)

Regular users are then segmented by average booking timing:

- Last-Minute Bookers (≤ 6 days before departure),
- Planned Bookers (≥ 7 days before departure)

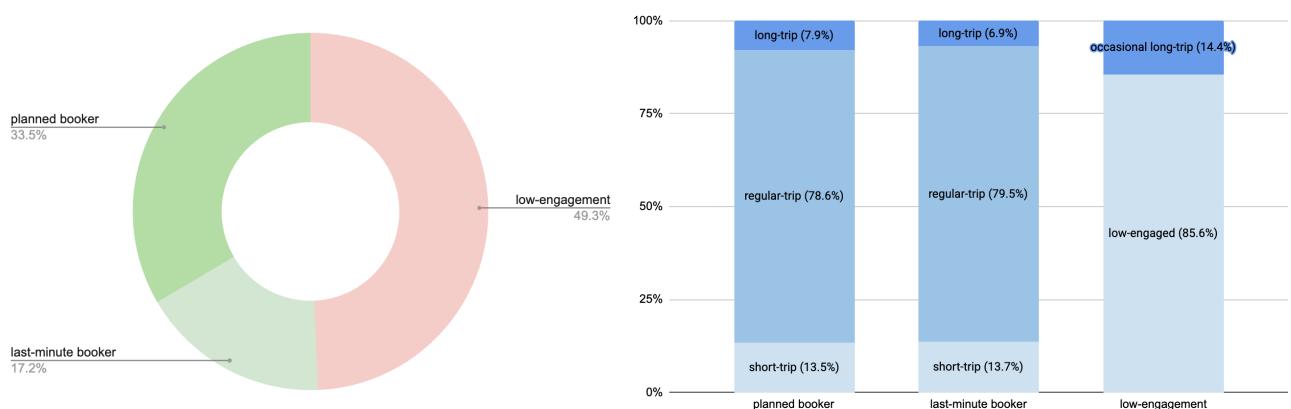
Finally, users are split by average trip length:

- Regular users: Short (≤ 2 days), Regular, Long (≥ 8 days) trips
- Low-Engagement users: Occasional Long-Trip (≥ 8 days) vs low-engaged (≤ 7 days)

This hierarchical approach creates coherent segments reflecting differences in travel intensity, planning style, and engagement.

Users Distribution

We now examine how users in the dataset are distributed according to the “Booking and Travel Behaviour segmentation”, as illustrated by the charts below.



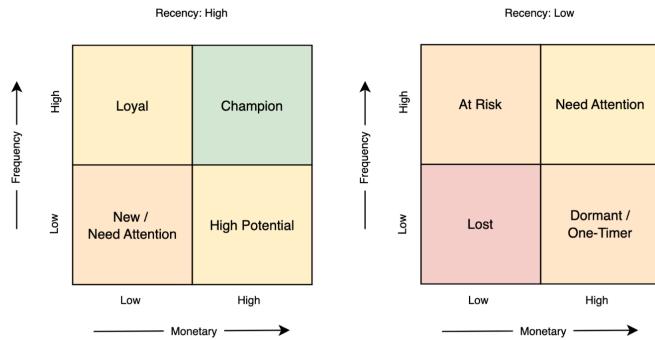
At the highest level (chart on the left), users are grouped by engagement and booking style into three main categories: planned bookers, last-minute bookers and low-engagement users. Almost half of all users fall into the Low-Engagement category, highlighting the importance of initiatives like this project to improve customer retention.

Each of these main groups is further divided into more specific segments based on trip length (chart on the right). This hierarchical view provides a detailed perspective on user behaviour across the platform.

RFM Segmentation

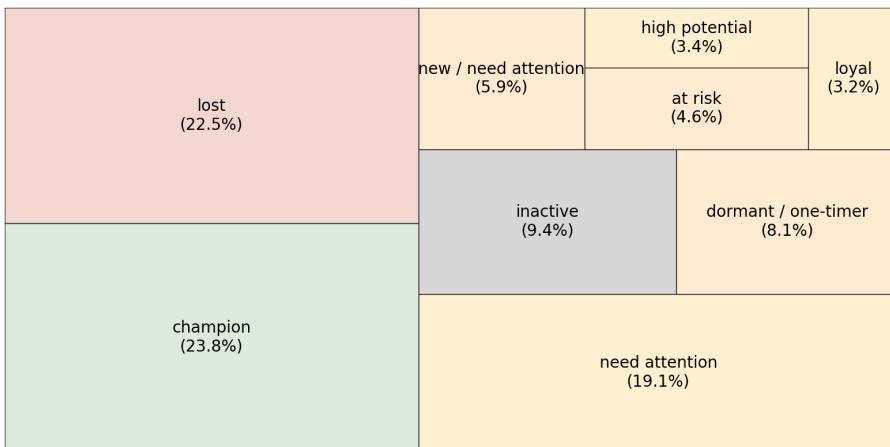
The second segmentation uses the RFM framework, evaluating users by Recency (how recently they booked), Frequency (how often), and Monetary value (how much they spend). Scores were computed using quintiles and simplified into binary “high” / “low” labels. Combining these labels produces eight customer segments (illustrated below).

It is important to note that this segmentation is relative: segment sizes reflect users’ position within the overall base, not absolute differences in behavior or value. This approach highlights differences in customer value and lifecycle stage, complementing the “Booking and Travel Behaviour segmentation”.



Users Distribution

We now examine how users in the dataset are distributed across the resulting RFM segments, as illustrated in the treemap below.

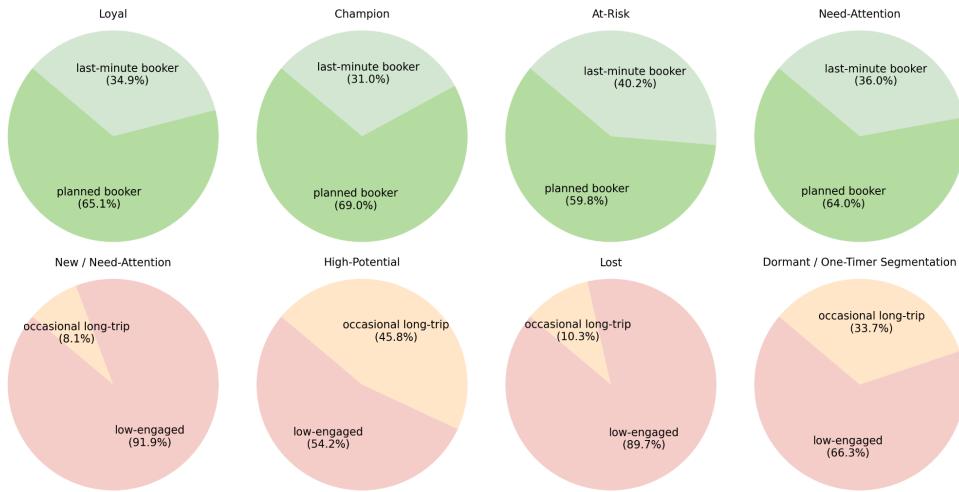


The treemap shows the distribution of users across the different segments. The largest groups are Champions (≈24%) and Lost users (≈23%), followed by Need Attention (≈19%). Mid-sized segments include Inactive (≈9%) and Dormant / One-Timers (≈8%), while New / Need Attention, At Risk, High Potential, and Loyal represent smaller shares of the user base.

Perks Allocation by User Segment

In this chapter, we define which perks and benefits to offer to TravelTide users, taking a two-step approach. First, the type of perk is determined based on the “Booking and Travel Behaviour segments”. Then, the way the perk is delivered—whether free, discounted, or paid—is tailored according to the RFM segment of each user.

It is important to note a key observation from our segmentations: all users in the four high-frequency RFM segments (Champions, Loyal, At Risk, Need Attention) belong only to Regular Users (Planned or Last-Minute Bookers), while those in the four low-frequency segments (New / Need Attention, High Potential, Lost, Dormant) fall entirely within Low-Engagement Users, as illustrated in the pie charts below.



Regular Users

Regular Users are divided into Last-Minute Bookers and Planned Bookers, and the type of perk is tailored to their booking behaviour.

LAST-MINUTE BOOKER PERKS

For users who tend to book trips close to the departure date, perks aim to improve speed, reduce friction, and provide immediate risk reduction:

1. Priority real-time support – quick assistance during the booking process.
2. Simplified changes, cancellations, and rebooking – reduce stress and make last-minute adjustments easier.
3. Pre-built packages – options designed by trip duration (short, regular or long trip), including family-ready choices when applicable.

PLANNED BOOKER PERKS

For users who plan trips well in advance, perks focus on comfort and convenience:

1. Priority access to offers – early notifications for deals and promotions.
2. Ability to hold or lock travel options – secure choices for a limited time before booking.
3. Pre-built packages – curated by trip duration (short, regular or long trip), with family-ready options when relevant.

Applying Perks to RFM Segments

CHAMPIONS

Goal: Reward loyalty and reinforce a sense of exclusivity.

Strategy: Users receive perks aligned with their booking behaviour free of charge, emphasizing privilege and appreciation.

LOYAL

Goal: Encourage further engagement and spending while maintaining a sense of privilege.

Strategy: Perks are offered with loyalty-friendly discounts, giving added value while recognizing their high engagement and spending.

NEED ATTENTION

Goal: Encouraging them to make their next booking quickly.

Strategy: Users receive perks aligned with their booking behaviour temporarily free of charge, creating urgency to book soon. In addition, time-limited discounts or offers further motivate immediate action and increase the likelihood of re-engagement.

AT RISK

Goal: Encourage both immediate booking and higher spending.

Strategy: Users are given perks with a temporary discount, creating urgency while gently incentivizing increased spending. Time-limited offers are also provided to further encourage quick action and reactivation.

Low-Engagement Users

Low-Engagement customers are divided into Low-Engaged and Occasional Long-Trip users, and the type of perk is tailored to their booking/travelling behaviour.

LOW-ENGAGED

Focus on encouraging bookings. Perks are designed to create incentives for the next trip, including:

1. Repeat-Purchase Benefits
2. Time-Limited Offers

OCCASIONAL LONG-TRIP

Low engagement is likely a natural behavior due to their travel style. Perks aim to make the booking smooth and convenient:

1. Pre-Built Packages, including family-oriented options when traveling with children
2. Time-Limited Offers for shorter trips to try to stimulate engagement

Applying Perks to RFM Segments

HIGH-POTENTIAL

Goal: Slightly increase booking frequency or encourage/simplify the next booking

Strategy: Offer perks aligned with the user's Booking & Travel Behaviour to gently nudge them toward a next booking

NEW / NEED ATTENTION

Goal: Encourage first or early bookings to increase both frequency and monetary value

Strategy: Provide perks aligned with the user's Booking & Travel Behaviour

Additional: Onboarding programs to help new users understand the platform and get started quickly

DORMANT / ONE-TIMER

Goal: Reactivate users with a first new booking; focus on frequency only after reactivation

Strategy: Time-Limited Offers to create urgency and stimulate the next booking

Additional (after reactivation): Perks aligned with the user's Booking & Travel Behaviour

LOST

Goal: Test reactivation potential, acknowledging that many of these users may churn

Strategy: Time-Limited Offers as short-term incentives to encourage one more booking

INACTIVE

Goal: Encourage first bookings

Strategy: Time-Limited Offers on the first booking and onboarding programs to help them understand the platform and get started quickly