TravelTide

Customer Segmentation & Perk Strategy

Maria Petralia - Data Science

The Business Challenge

Five perks. Thousands of users.

- Perks cost money.
- The wrong perk is just noise.
- The right perk is a reason to return.

What Travelers Don’t Tell You…

But Their Behavior Does

The Data Universe

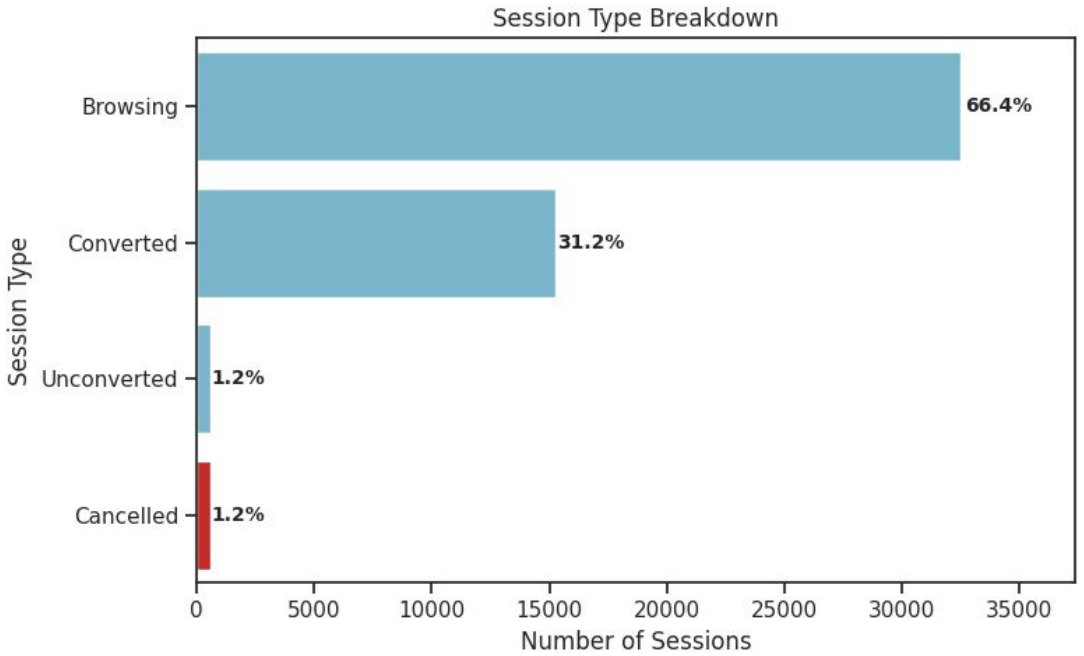
From millions of interactions to a clean behavioral cohort

- **Business request:** use five perks in the new rewards program
- **Starting point**: 1M users, 5.4M sessions, 4M trip components
- **Cohort definition:** users active **after 04.01.2023** with **more than 7 sessions**
- **Validation & Cleaning**: fixed inconsistent dates and fields, ensured full trip lifecycles
- **Final cohort**: **5,998** users active after January 4th, 2023 with **8+ sessions on average**

A clean, consistent, behaviorally meaningful dataset.

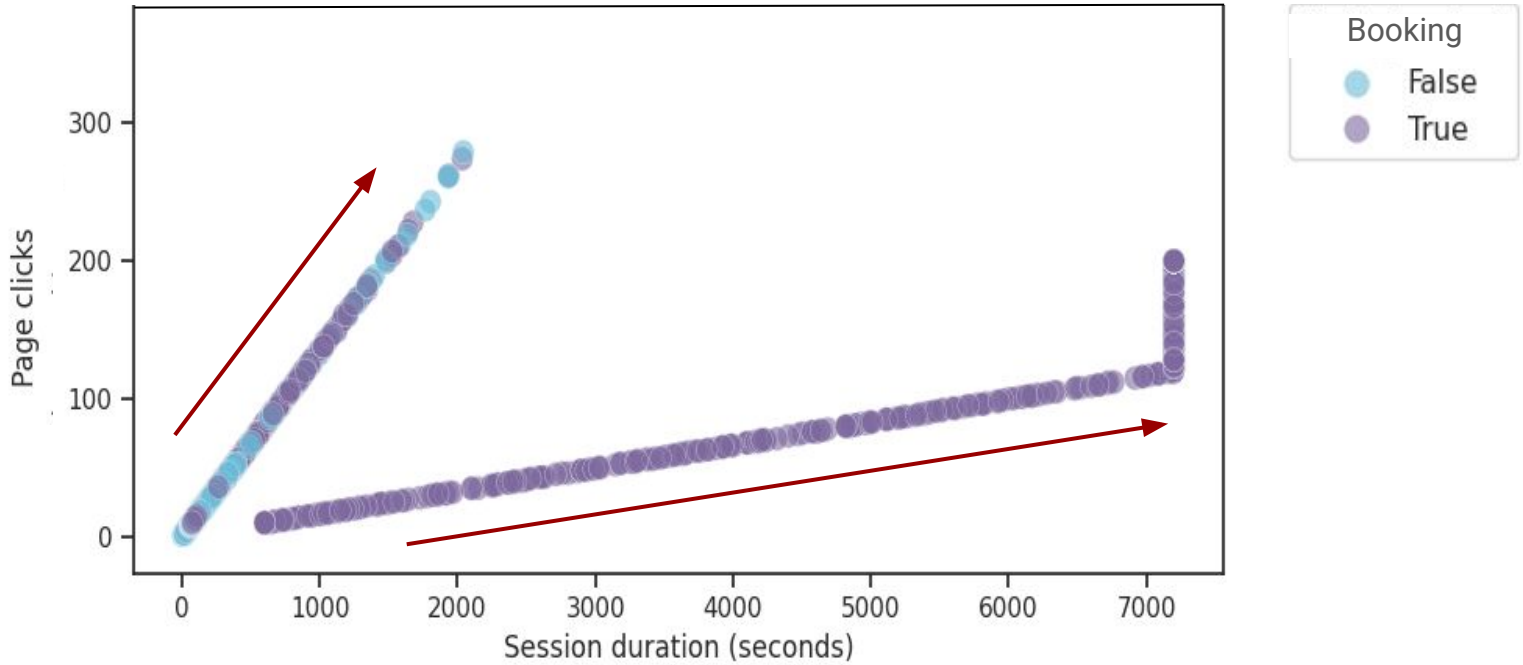
Session Type Distribution

Browsing dominates the user journey, while booking sessions are fewer and cancellations are rare, making session-level data insufficient to understand intent.



Browsing and Booking Behave Differently

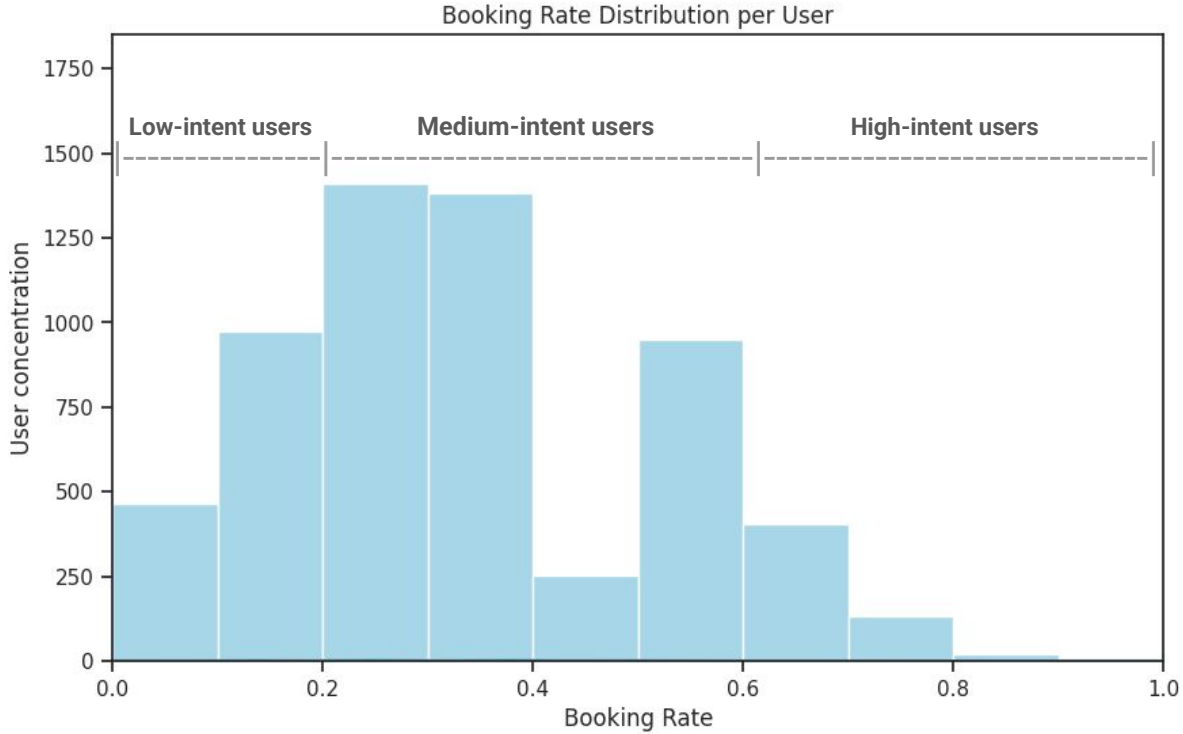
Booking sessions typically take more time but involve fewer clicks than browsing sessions.



From Sessions to Users

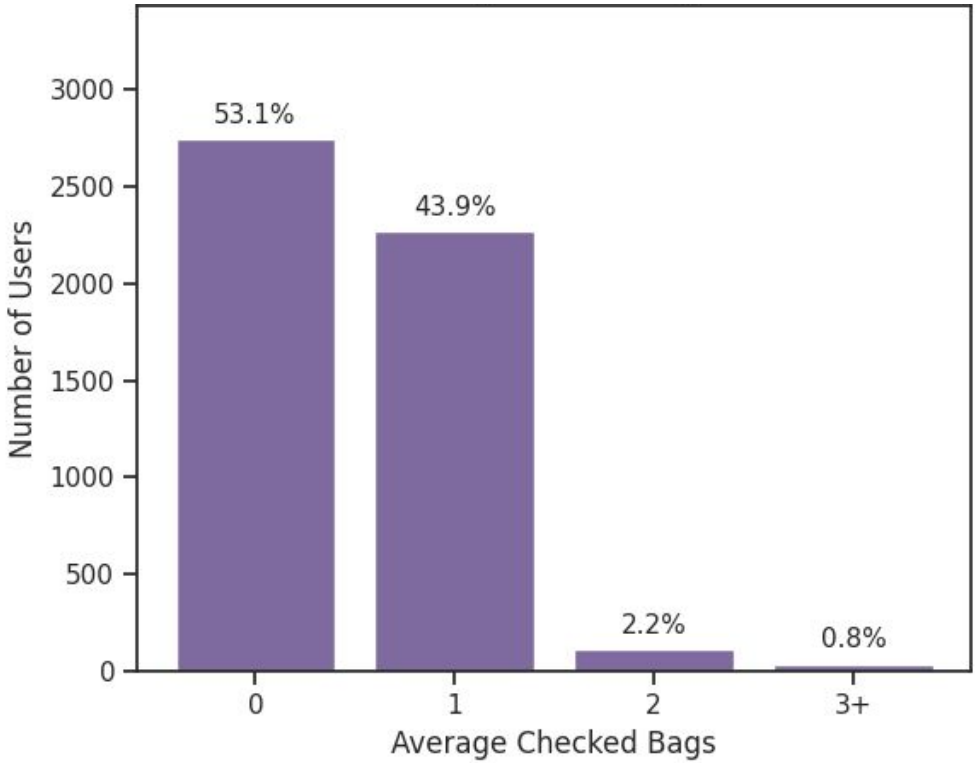
Intent through Engagement

Users engage with the Platform in Very Different Ways



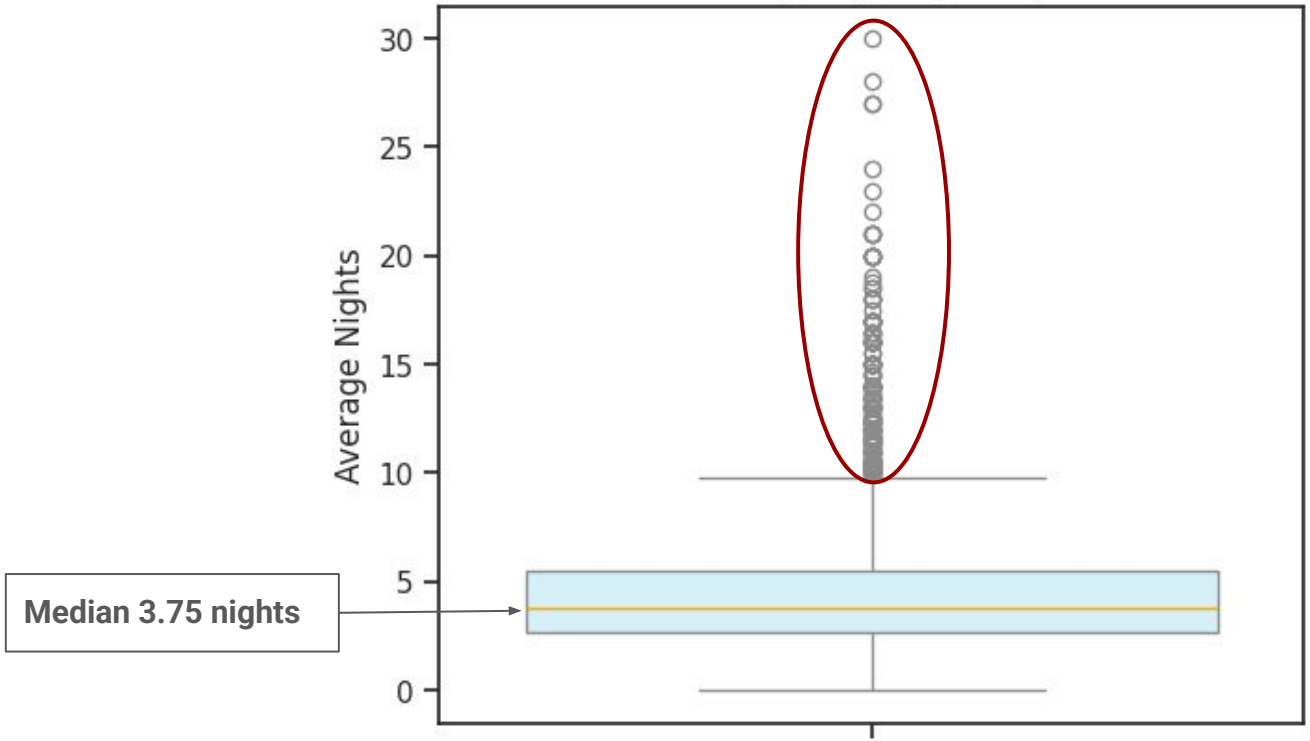
How Users Start Their Trip

Most users travel with no or one checked bag



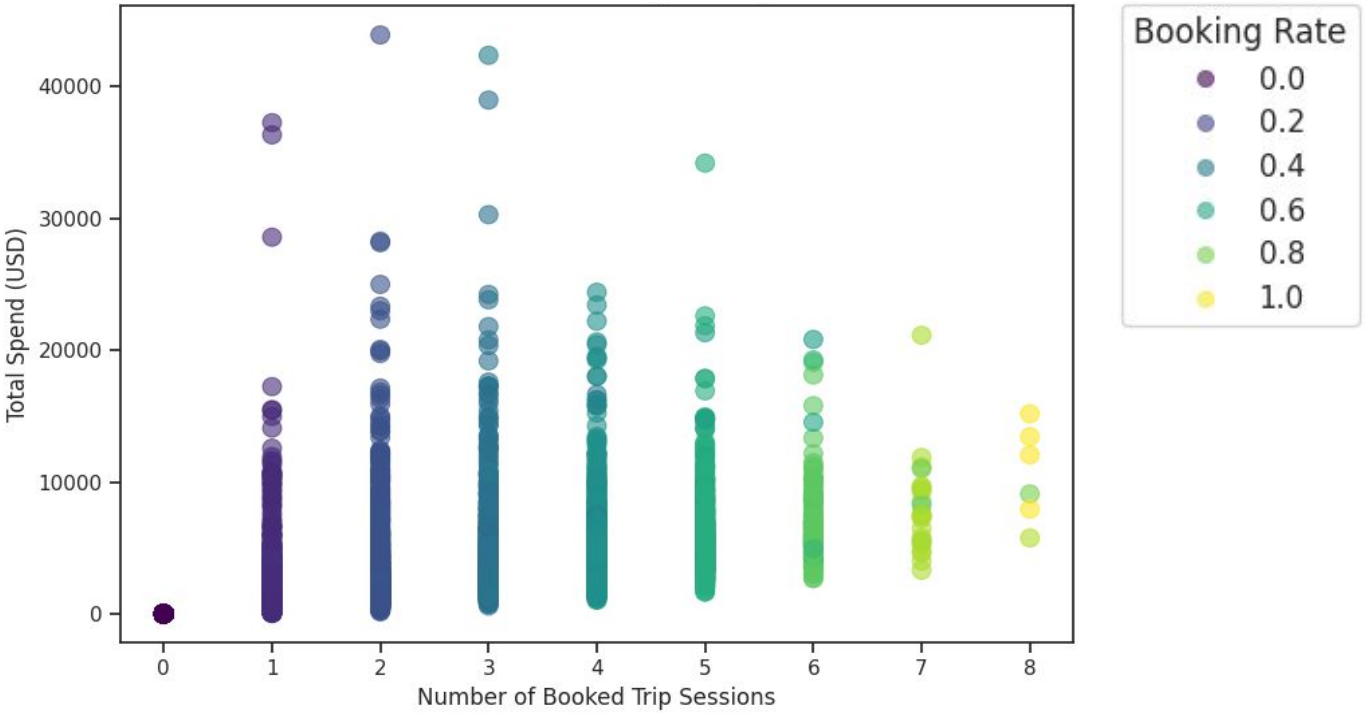
How Users Start Their Trip

They typically stay between 2 and 5 nights



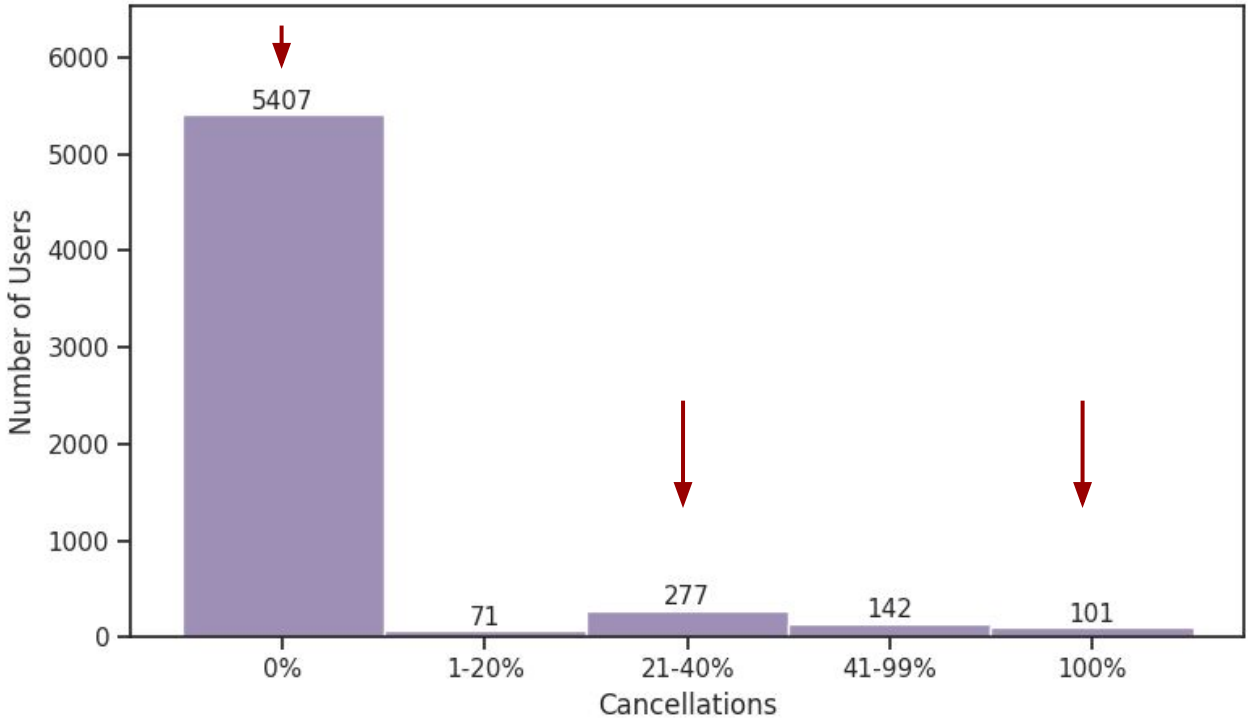
From Trip Complexity to Business Value

Users with low-to-moderate booking sessions can generate exceptionally high value.



Users’ Cancellation Behavior

Most users never cancel, but a small minority carries significant cancellation risk.



From Behavior to Actionable Segmentation

- **Value** – economic value generated by the user
- **Risk** – how fragile that value is to cancellation
- **Complexity** – how demanding the trip is to plan and manage
- **Engagement** – how users interact with the platform over time

From Behavioral Dimensions to Perks

Perks are not only rewards. They are targeted interventions.

No Cancellation Fees
Reduces hesitation for high-stakes trips

Free Hotel Meal
Adds value without price cuts

Free Checked Bag
Removes friction from complex travel

1 Free Hotel Night with Flight
Encourages bundling

Exclusive Discount
Accelerates conversion for reliable users

How perks are assigned: from behavior to intervention

Each user receives one perk, based on priority and eligibility

No Cancellation Fees
Reduces hesitation for high-stakes trips

Who gets it

- At least **1 completed trip**
- **Some cancellations**, but not many
- **High-value or complex trips**

Why

Reduces hesitation in high-stakes decisions
Supports commitment **before booking**

How perks are assigned: from behavior to intervention

Each user receives one perk, based on priority and eligibility

Free Checked Bag
Removes friction from complex travel

Who gets it

- **Flight travelers**
- **Moderate or complex trips** (distance, duration, groups)
- Also some flight-only users who previously canceled

Why

Removes **logistical and cost friction**
Addresses baggage as a breaking point

How perks are assigned: from behavior to intervention

Each user receives one perk, based on priority and eligibility

1 Free Hotel Night with Flight

Encourages bundling

Who gets it

- Users with **flight + hotel experience**
- **Engaged**, low-risk travelers
- Not hotel-heavy planners

Why

Encourages **bundled bookings**
Drives cross-sell behavior

How perks are assigned: from behavior to intervention

Each user receives one perk, based on priority and eligibility

Exclusive Discount
Accelerates conversion for reliable users

Who gets it

- **Very reliable users**
  (almost no cancellations)
- **High or mid value**, strong engagement
- Or users who **never booked yet**

Why

Accelerates conversion
Rewards reliability without increasing risk

How perks are assigned: from behavior to intervention

Each user receives one perk, based on priority and eligibility

Free Hotel Meal

Adds value without price cuts

Who gets it

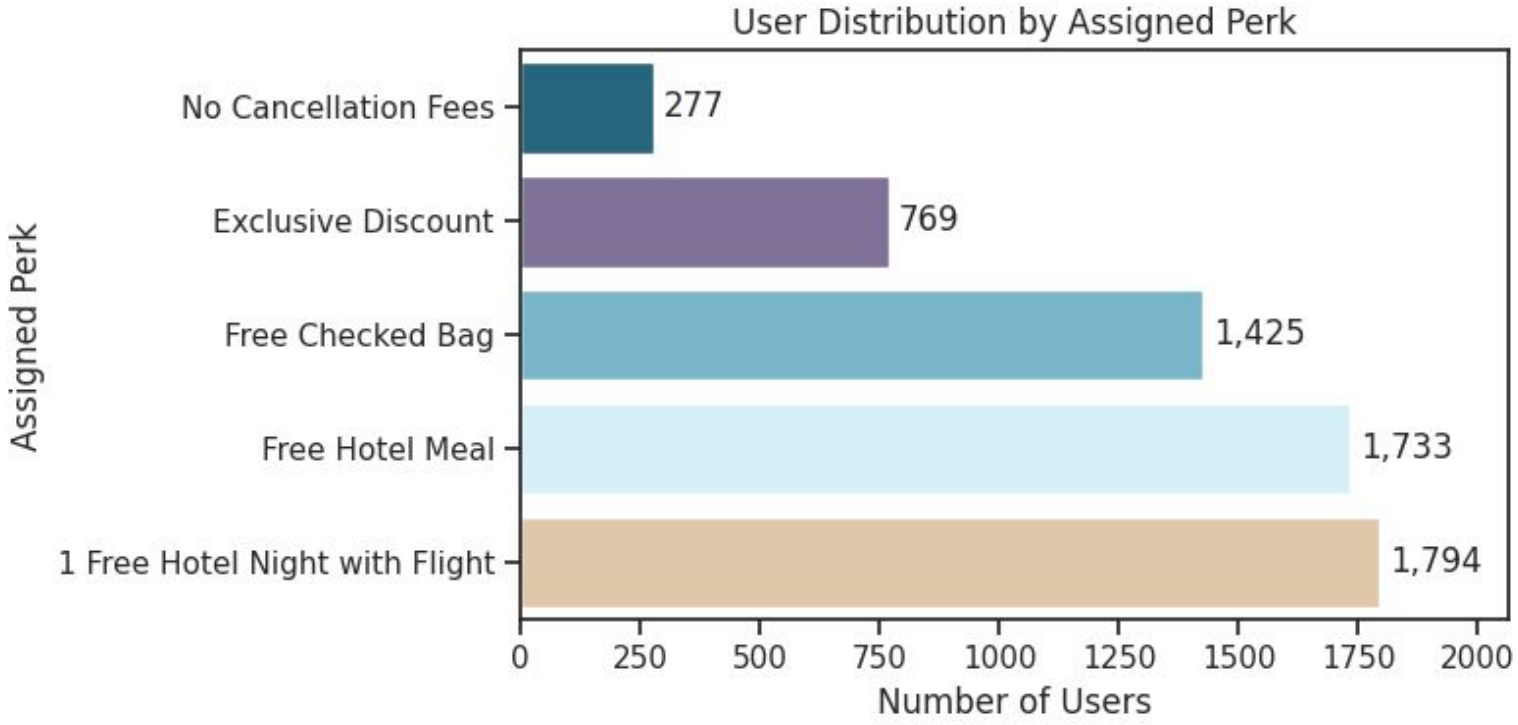
- Users with **hotel history**
- **Low or no cancellation risk**
- Completed at least one trip

Why

Adds experiential value
Supports retention without price cutting

Perk Allocation

Perks are not evenly distributed - and that is intentional



Clustering as Validation

The model only sees what users did, not how we interpreted it

What went into the model

- **Direct user activity**
  (sessions, booking attempts, cancellations)
- **Observed trip characteristics**
  (distance, duration, nights, bags, seats)
- **Actual booking outcomes**
  (conversion, spend per trip)
- **Product usage signals**
  (flight history, hotel history)

No RFM - No CLTV - No scores or tiers - No engineered dimensions - No perks

Clustering as Validation

How clustering was built

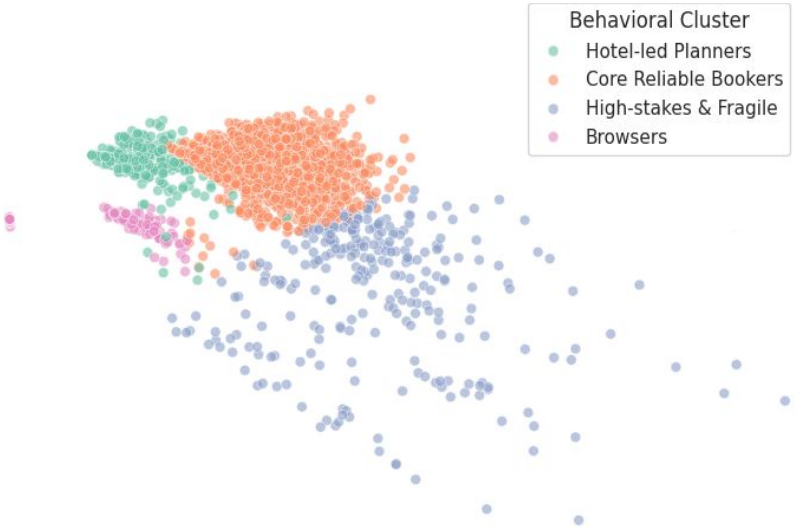
Unsupervised model (K-Means)

- Built on raw behavioral signals only
- No business rules, no perks, no scores

Model choice

- **4 clusters**
- Selected using:
    - Elbow method
    - Silhouette score (best balance of separation & interpretability)

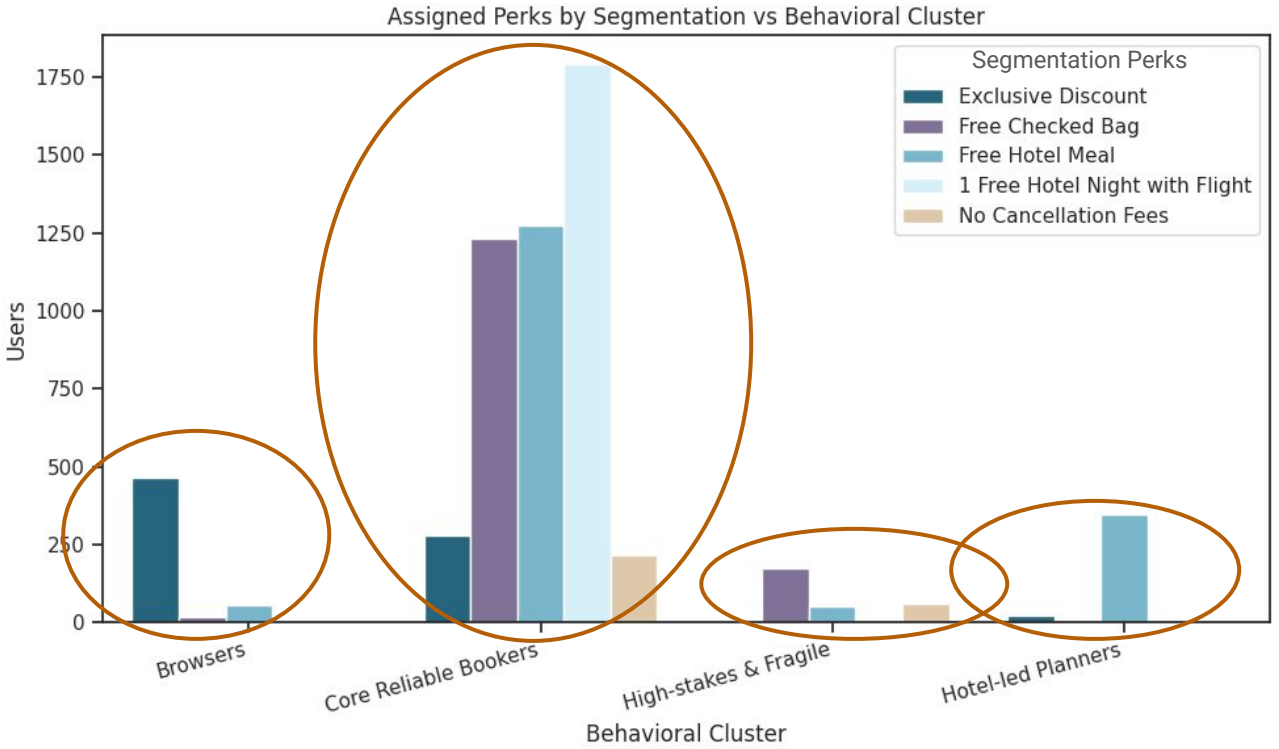
What the Clustering Revealed



Cluster	Core behavior
High-stakes & Fragile	High spend, complex trips, high cancellation
Core Reliable Bookers	High conversion, low risk, balanced trips
Hotel-led Planners	Hotel-centric, long stays
Browsers	Very low booking, exploratory behavior

Perks align with behavioral clusters

Perks concentrate where the underlying friction exists



Recommendations

Remove the right friction, at the right moment.

- Use perks to remove specific frictions
- Support high-value trips without over-discounting
- Apply discounts only where they speed up conversion