Travel Tide Reward Program User Segmentation and & Perk Assignment

Personalizing Travel Perks with Data:
Final Project Presentation

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Project Overview

Objective:
Use data-driven insights to personalize perks for TravelTide users based on their behavior and demographics.

Goals:

- Segment users with clustering (K-Means & DBSCAN)

- Assign a tailored perk to each user

- Create visual insights for stakeholder decision

Data & Methodology

Dataset Highlights:

- 15+ user behavior & profile features

- 100 users sample (for processing)

Key Techniques Used:

- Preprocessing & Feature Scaling

- PCA for dimensionality reduction

- K-Means and DBSCAN for clustering

- Mapped clusters to relevant travel perks

Clustering & Perk Assignment

K-Means Clusters → Assigned Perks:

✅ **Each user received a personalized**

perk based on cluster assignment.

🎯 Goal: To personalize the travel reward experience by
assigning each user a perk that aligns with their
Behavior and needs, thereby increasing engagement and
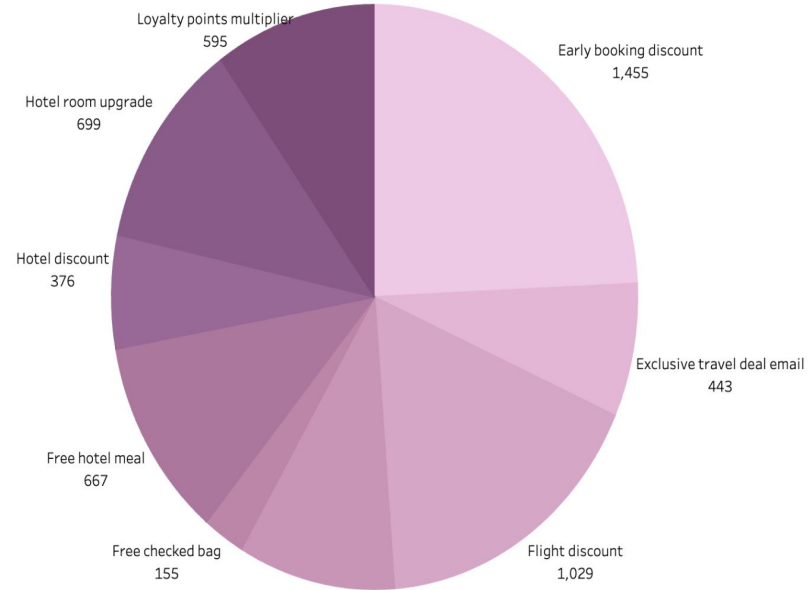conversion.

🧩 Method: Users were grouped into 9 clusters using K-Means.
Each cluster was mapped to a tailored perk based on user
characteristics

user_id	group_k_means	assigned_perk
23557	2	Hotel discount
94883	0	Free hotel meal
101486	0	Free hotel meal
101961	3	Flight discount
106907	8	Exclusive travel deal email
118043	3	Flight discount
120851	0	Free hotel meal
125845	6	Early booking discount
133058	4	Loyalty points multiplier
149058	3	Flight discount

Insights from Visualizations:

We now see a pie chart that

shows

what number of users are

assigned to each perk.

Assigned Perk Distribution

Loyalty points multiplier
595

Hotel room upgrade
699

Hotel discount
376

Free hotel meal
667

Free checked bag
155

Early booking discount
1,455

Exclusive travel deal email
443

Flight discount
1,029

Percentile of Count of m...
0.00%   100.00%

Assigned Perk
- Early booking discount
- Exclusive travel deal ...
- Flight discount
- Free cancellation
- Free checked bag
- Free hotel meal
- Hotel discount
- Hotel room upgrade
- Loyalty points multip...

📊 **What This Shows:**

We see which perks were

assigned to users who bring

Assigned Perks by Total Money Spent on Hotels

3,257,880 Flight discount	1,251,299 Hotel discount	565,641
	1,080,854 Free cancellation	354,749 Free
2,619,218 Early booking discount		347,696 Free
	930,936 Hotel room upgrade	

the most hotel revenue — for example **"Early booking discount"** or **"Flight discount"** dominate because they align with high-spending Segments..

A mapping table provides the assigned perk, the target segment, and the business rationale.

	Cluster	Perk	Segment	Rationale
0	0	Free hotel meal	Leisure travelers with low spend	Encourages hotel engagement and improves perce...
1	1	Free cancellation	Risk-averse planners	Increases booking confidence among cautious users
2	2	Hotel discount	Frequent hotel users	Rewards and retains price-sensitive hotel bookers
3	3	Flight discount	Frequent flyers	Drives more flight bookings from active fliers
4	4	Loyalty points multiplier	High-value loyal users	Boosts retention and rewards ongoing loyalty
5	5	Hotel room upgrade	Business travelers	Improves experience for high-spend, quality-se...
6	6	Early booking discount	Planners with long lead times	Encourages even earlier bookings
7	7	Free checked bag	Business users with frequent flights	Adds convenience for frequent, efficiency-mind...
8	8	Exclusive travel deal email	Low-activity or undecided users	Keeps low-engagement users in the loop with at...

This stacked bar chart shows how each assigned perk was distributed between male and female users. This visualization helps identify any potential gender-based preferences or trends in perk assignments.


Perk Assignment by Gender
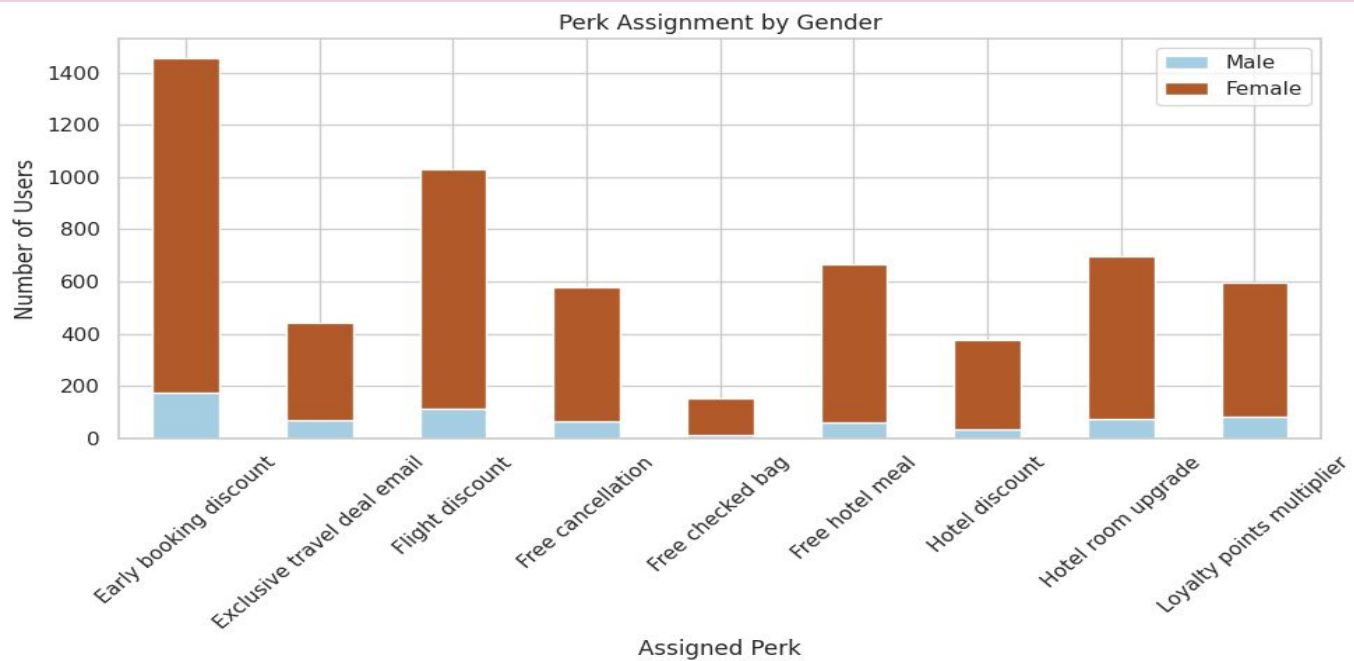
This bar chart displays the **average age** of users for each **assigned perk**, highlighting how different perks appeal to different age groups.

Average Age per Assigned Perk

Assigned Perk

Perk	Avg. Age
Early booking discount	43
Exclusive travel deal email	43
Flight discount	45
Free cancellation	43
Free checked bag	40
Free hotel meal	54
Hotel discount	39
Hotel room upgrade	44
Loyalty points multiplier	28
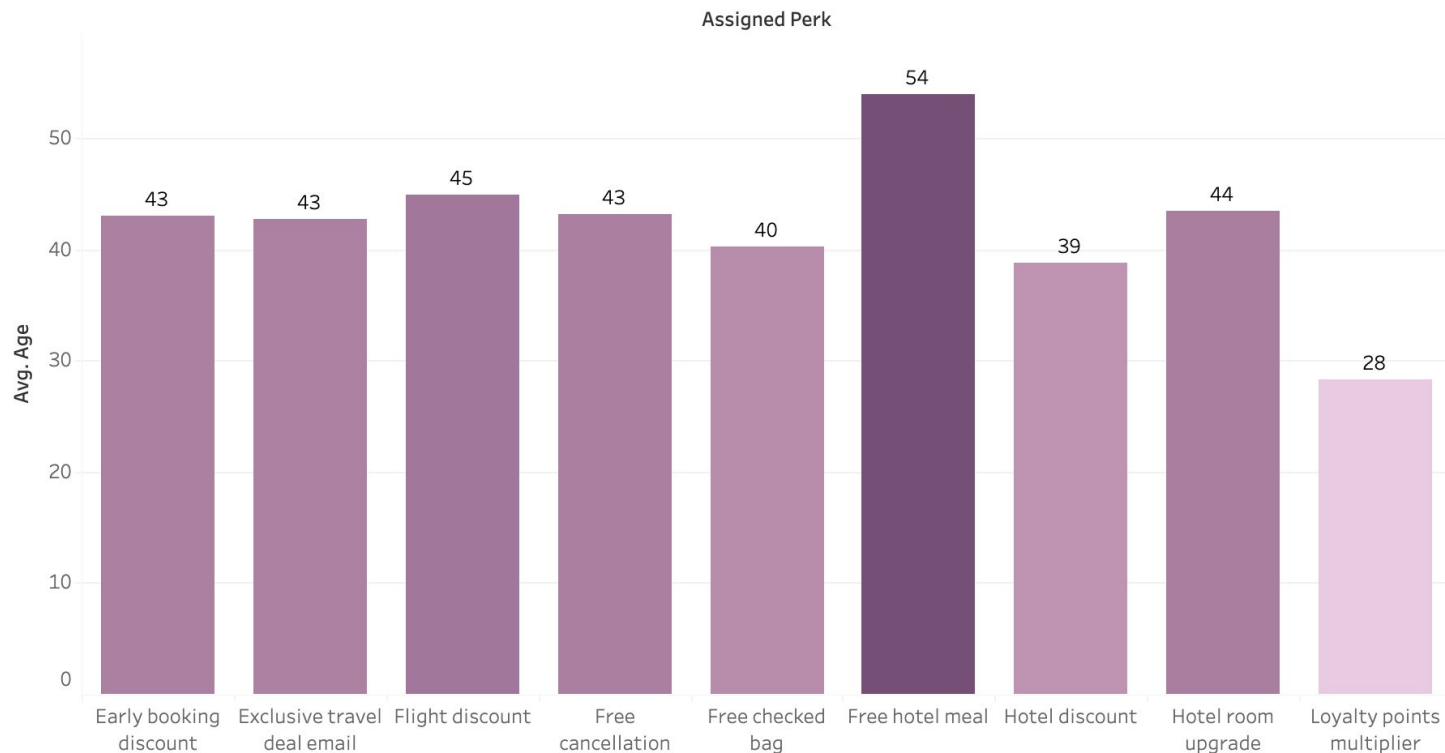
This bar chart compares assigned perks between high and low engagement users. High engagement users prefer perks that reward frequent use (e.g., upgrades), while low engagement users favor simpler perks like free cancellation or discounts.

Perks by Engagement Level
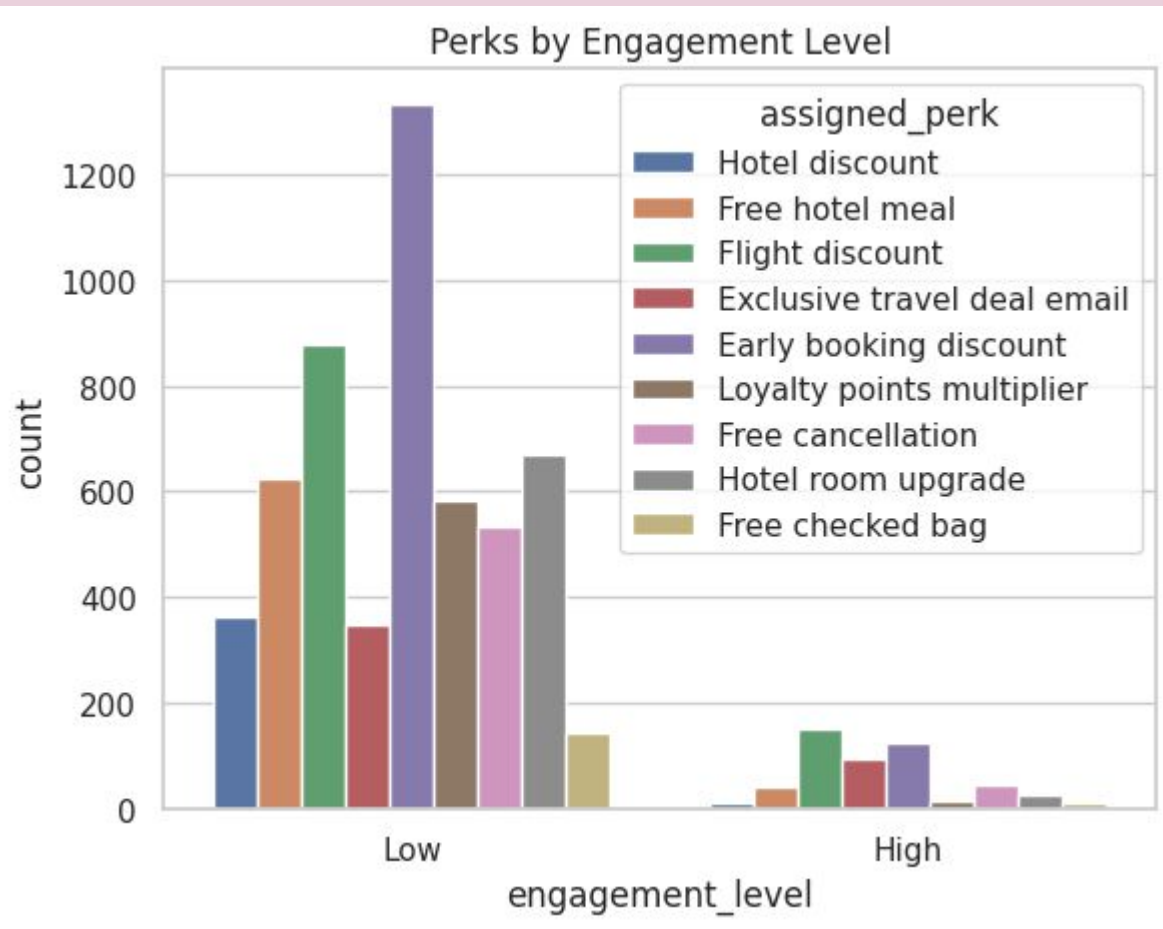
Reward Strategy Backed by User Insights

We analyzed user behavior to better understand how travelers engage with TravelTide's platform. By grouping users with similar habits (like how often they travel or how long they stay), we identified meaningful customer segments. Based on these segments, we assigned personalized travel perks—such as free hotel meals, flight discounts, or early booking deals—that best match their needs.

This approach helps ensure each user gets a perk they're more likely to value, increasing the chances they'll book again. It also allows TravelTide to target high-value users with premium rewards while encouraging less active users to re-engage with simpler incentives.

Recommendations for Enhancing the TravelTide Rewards Program

- **Segment-Based Perk Personalization**
 Assign perks based on distinct user clusters (e.g., business vs. leisure travelers), using K-Means and DBSCAN group insights to match rewards with travel behavior and preferences.

- **Engagement-Aware Incentives**
 Differentiate perks for high vs. low engagement users. Offer premium rewards (e.g., room upgrades, loyalty multipliers) to active travelers, and simple, universally attractive perks (e.g., free cancellation) to re-engage less active users.

- **Dynamic Reward Optimization**
 Monitor perk uptake and engagement trends across segments. Use feedback loops and behavioral tracking to adapt rewards in real time.

- **Future Enhancements**
 Implement tiered loyalty levels to motivate long-term engagement. Integrate A/B testing and user feedback to continuously refine the reward offerings.

Thank you! For questions:
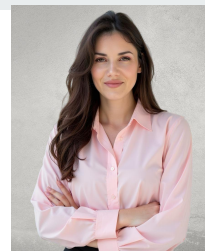
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Resources:

Google Collab:
https://colab.research.google.com/drive/19W1kFJHXrNb5SISZg9zB_rGNHW_EDR0s?usp=sharing

Tableau:
https://public.tableau.com/app/profile/andrea.cigrovski/viz/TravelTideProject_17528723614330/Dashboard1

Github: https://github.com/andreacigrovski/TravelTide