Puzzle Game Data Analyst Case Study

Part I:

a) Proposing a simple A/B test that could deliver a quick win with metrics I would monitor to evaluate its success.

The current Shuffle power-up reorders all conveyor belt cards randomly, which can feel unfair and wasteful. Introducing a targeted "swap" mechanic: allowing the player to swap *one specific color group* on the belt with another. Replacing the fully random Shuffle with a skill-based, targeted swap option will make players feel more in control, reducing frustration and improving progression. Because it's perceived as *more valuable* than a random shuffle, it can be priced higher or bundled, leading to increased coin spend without hurting engagement.

Design

- **Control (A):** Current Shuffle power-up : randomizes all conveyor cards.
- **Test (B):** New "Color Swap" power-up : player chooses one color group on the conveyor to swap with another color group in the same column.
    - Example: Swap a group of red cards currently on the bottom of the belt with a group of blue cards that are further up in the same column
- **Usage rules:**
    - 1-2 free uses per week for all players (drives adoption and habit).
    - Additional uses purchasable with coins or bundled with other power-ups.

Monetization Opportunities

- **Premium Pricing:** Priced at about 1.5x the Shuffle cost to reflect higher strategic value.
- **Event Rewards:** Make it a rare prize in events, driving event participation.
- **Weekly Freebie:** Use the free weekly version as a funnel to paid usage (players try it, like it, buy more).

Metrics to Track

- **Power-up usage rate** (do players prefer it over Shuffle?): % of players using the free daily swap vs % who purchase extra uses.
- **Level completion rate** (especially levels with high overflow fails).
- **Coins spent on power-ups** (does this cannibalize Shuffle purchases or increase total spend?)
- **Retention** (Day 1, Day 3, Day 5, Day 7).

b) Proposing new features or systems would you propose adding to support the game's long-term retention.

While the game already offers multiple reward systems that enhance gameplay, one area that could improve long-term retention from my experience is **player personalization**. Currently, all cards and trays are generic colors, which limits the player's sense of ownership or personal connection to the game.

1. I would propose introducing customizable game designs, such as:

- Themed icons instead of plain colors – ex. Candy land theme cards/trays/background
- Seasonal or event-based card skins to keep content fresh.
- Unlockable designs tied to achievements or milestones,

Why it helps retention:

- Personalization increases **emotional attachment**, making players more likely to return.
- Collectible/achievement-linked designs create **long-term goals**, encouraging daily play.
- Seasonal or rotating designs can drive **re-engagement** among lapsed players.

2. I would also propose another challenge game play setting that encourages mastery such as:

- **Hard-mode training levels:** Make the hardest levels replay-able for special rewards (i.e. a swap card or special game skins), giving players a way to practice and master the game.

Why it helps retention:

- Replay-able hard levels reduce frustration and provide meaningful progression for experienced players.

Part II: Analyzing an A/B test - "Pay to Play" test

The data belongs to the "Pay to Play" test, where a casino-like mechanic was introduced. Players were required to bet 20 coins to initiate an attempt.

A successful attempt (level win) will lead to 40 coin rewards. A failed attempt (level loss) will result in loss of coins bet and one life. Also, a player can collect 60 coins every 4h for free in this cohort. In the control group, an attempt has no upfront cost, and a successful attempt leads to 10 coins rewards whereas a failed one leads to losing one life.

a) Why I think the game team decided to run this experiment:

This experiment was likely run to test whether the new casino feature **increases in-game revenue and player engagement**. The feature leverages risk/reward incentives, adding excitement beyond the standard gameplay. By allowing users to risk coins, it may also encourage increased in-game spending and deeper engagement with other game features.

b) What I would define as the primary success metric for this test:

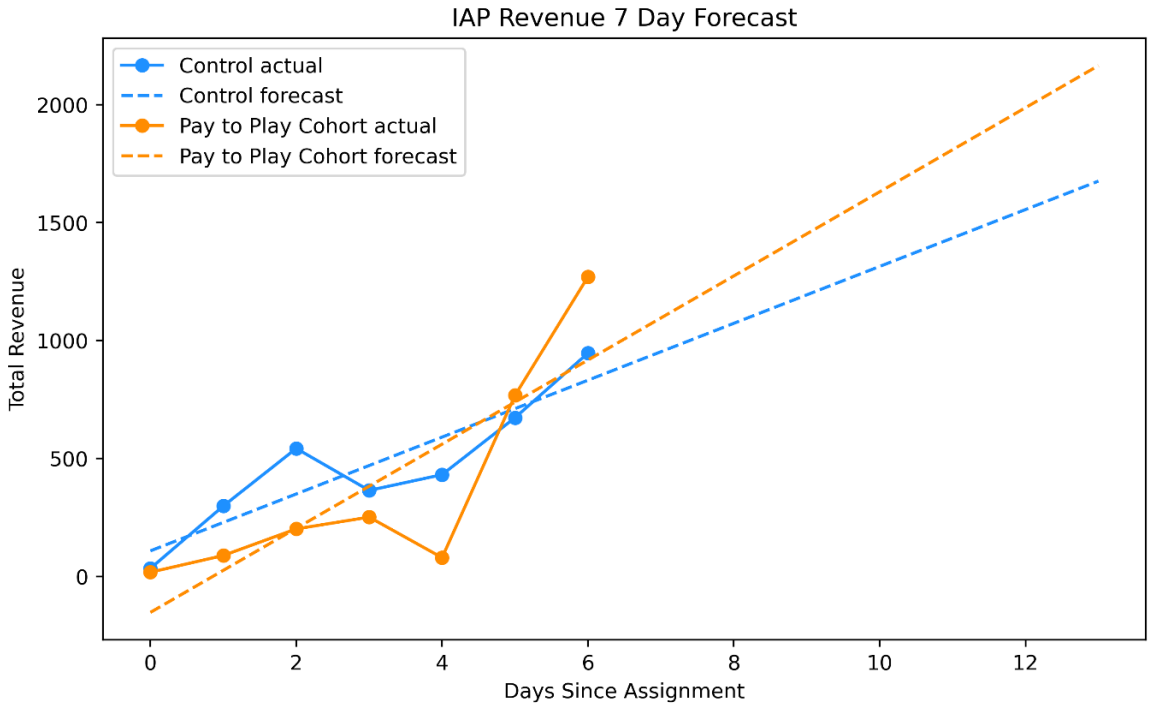
For this A/B test, the **primary success metric** is **revenue**, as the ultimate goal is to maximize monetization. However, given the **7-day limitation** of the provided dataset, short-term behavioral signals are necessary to evaluate early trends and engagement.

I have chosen the following **leading indicators** that point to the likelihood of future spending:

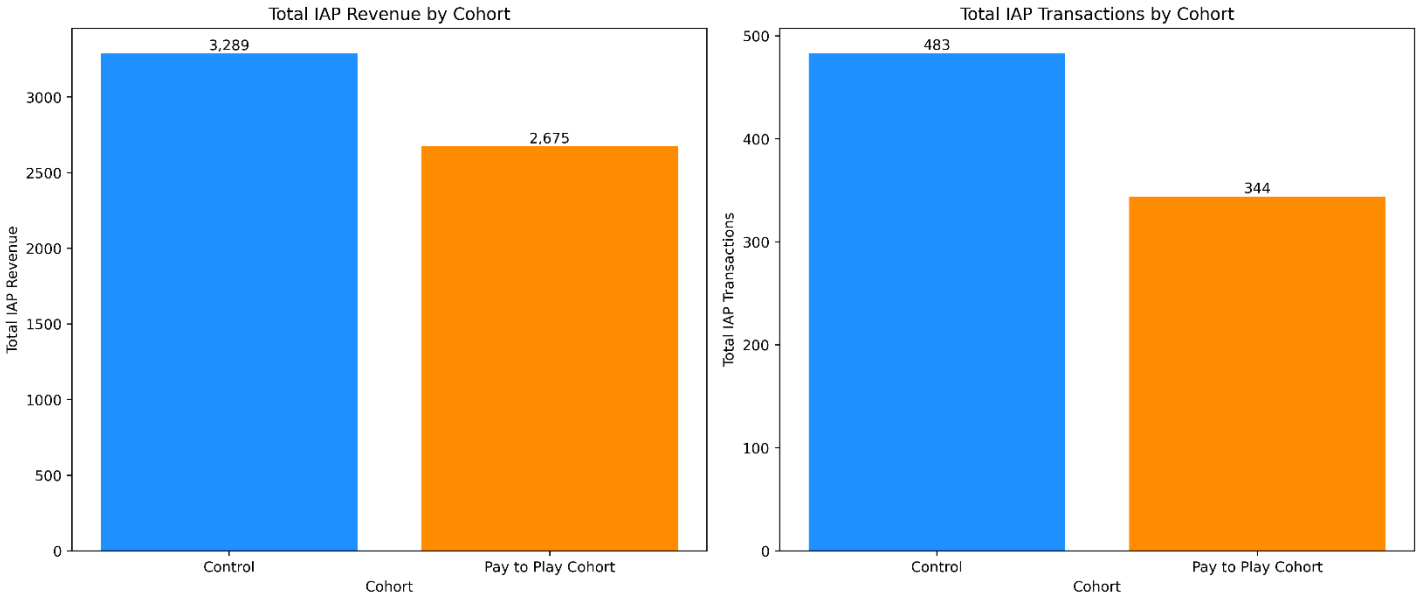
1. **iap_transactions** – tracks early in-app purchases
2. **session_length_seconds** – measures time spent in the app and indicates user interest

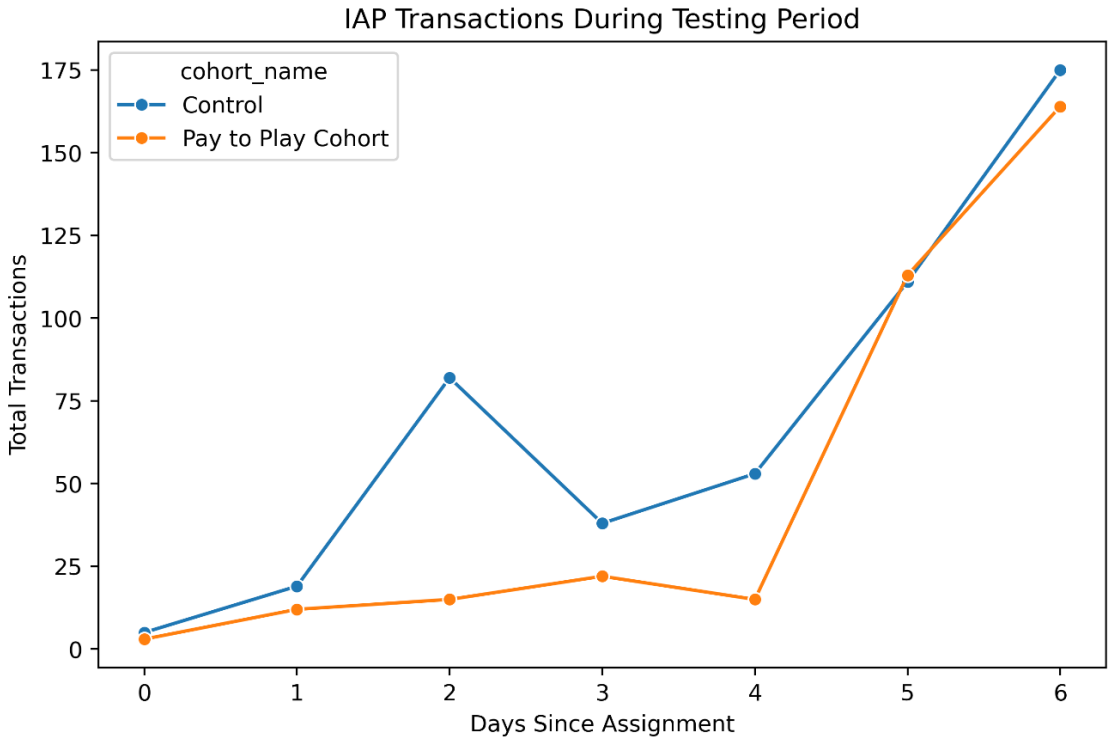
c) Is there a clear winner?

We cannot declare a winner yet considering that the short 7-day window captures early trends but may not reflect the ultimate performance of the PTP feature. While the control cohort generated slightly higher total IAP revenue (614 euros more) during the 7-day testing window, the Pay to Play (PTP) cohort shows a strong upward revenue trend, suggesting potential for higher revenue in the long term.



Leading indicators reinforce this: although the PTP cohort had slightly fewer transactions, the average transaction value appears higher, and revenue growth is accelerating. This shows that the casino mechanic (risk/reward) is positively influencing the users to spend higher as well.





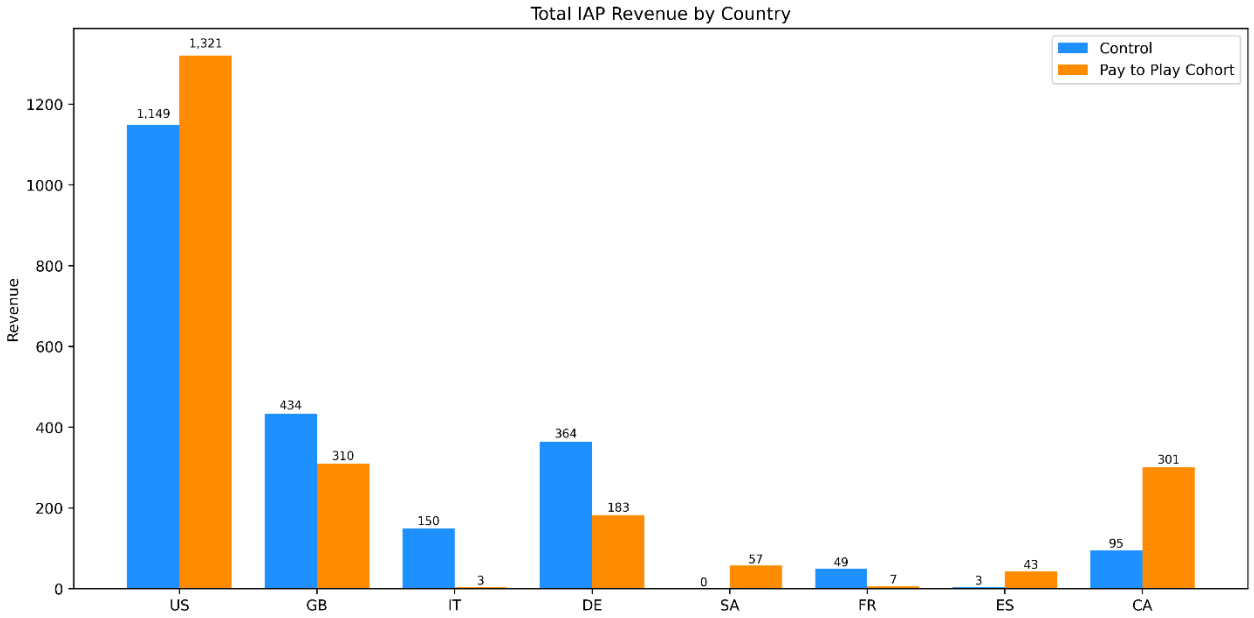
Although the control cohort recorded 139 more transactions, Pay-to-Play (PTP) users showed a stronger upward spending trend. After an initial 4-day hesitation period as players adjusted to the new feature, PTP saw a surge of over 100 transactions in a single day. While weekly totals still favored the control group, PTP is demonstrating stronger long-term monetization potential.

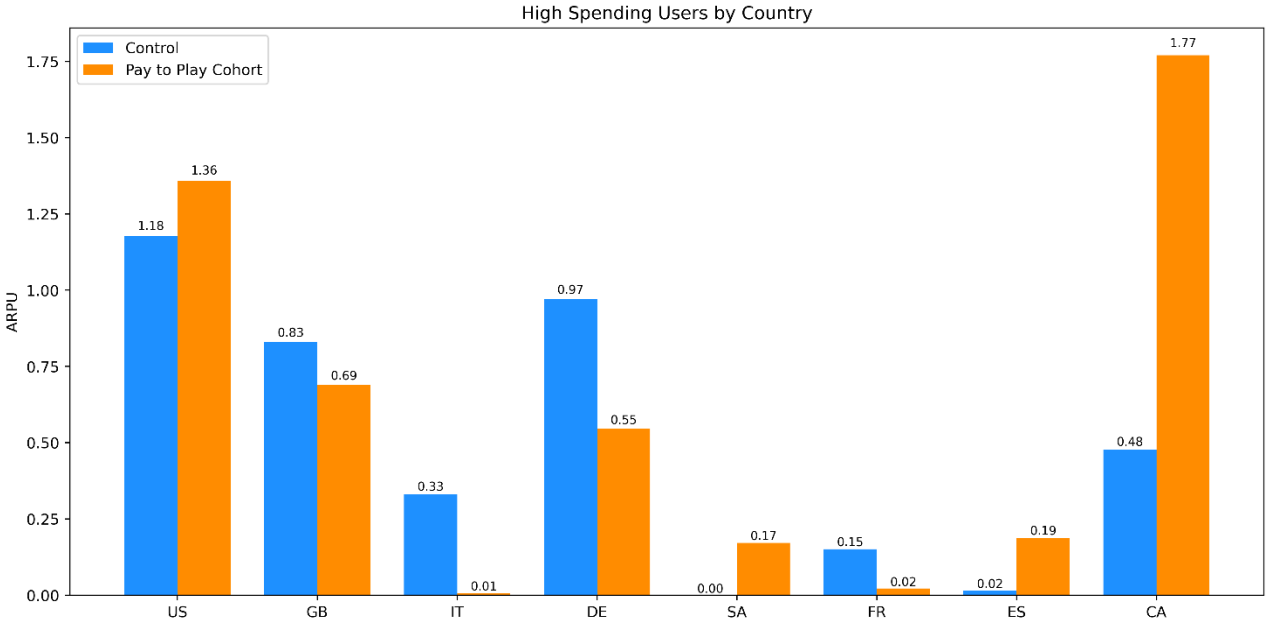
d) Business recommendations for the game manager based on my findings:

My recommendation would be to Prioritize Pay to Play in key regions. The U.S. shows the highest total revenue with PTP already surpassing Control. Canada is also of interest, where the P2P revenue tripled

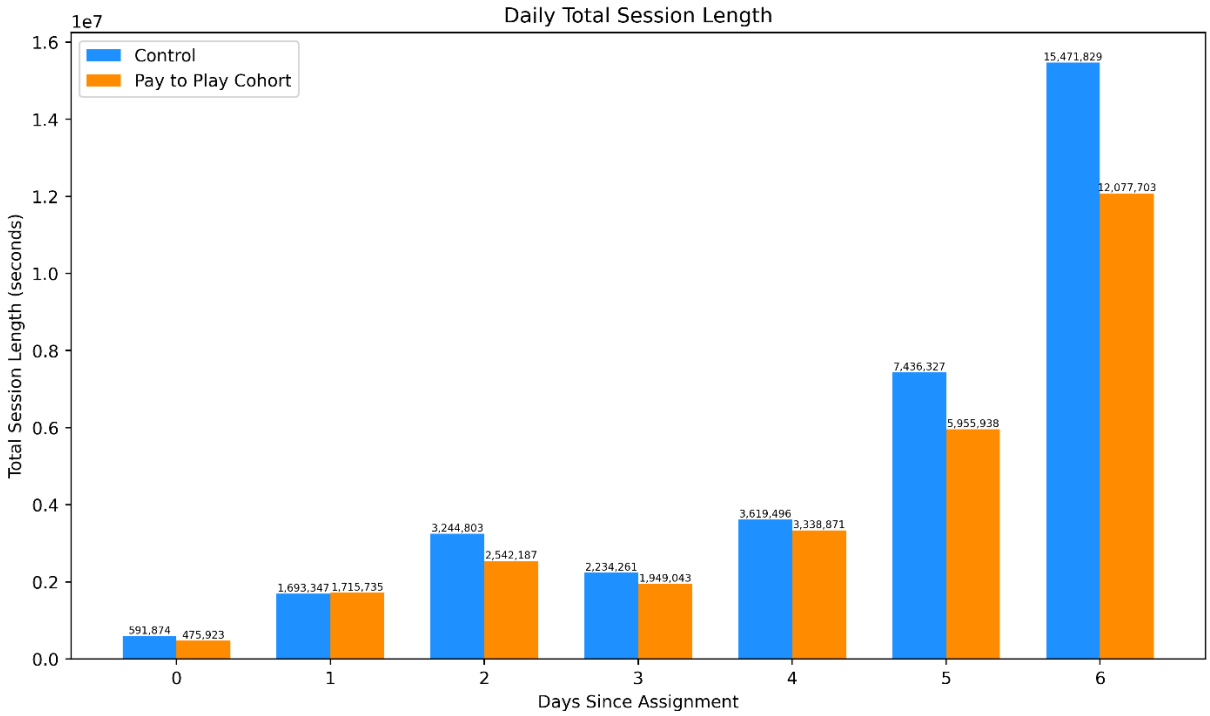
that of the Control revenue. Canada also shows the highest ARPU (average revenue per user) for PTP, suggesting strong per-player monetization potential. Therefore, early rollout and further iteration should focus on these two markets, where the mechanic resonates most.

Additionally, capitalize on higher value transactions such as tailoring bundles or premium offers to the higher spending audience further reinforcing the appeal of risk/reward experiences.





e) My suggestions for future iterations or improvements:



This side-by-side bar chart shows session length totals(in seconds), with PTP slightly lower than Control but displaying an almost consistent daily increase.

My recommendations therefore are to consider minor adjustments to the 4hr session cooldowns or reward mechanics (such as smaller but more frequency rewards) to encourage longer sessions and sustained engagement.