



# Retention Radar

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## Preface

### Welcome to the App Hive!

The mobile app ecosystem has grown into an interconnected network of apps, where users move fluidly throughout their day to meet functional and emotional needs. At Aarki, we see this ecosystem as the "**App Hive**"—**a dynamic, interdependent ecosystem where every app contributes to the larger flow of user behavior**. Yet, many advertising strategies still function in isolation, failing to align with this interconnected reality.

This is where Aarki's infrastructure makes the difference. Being capable of analyzing 38 trillion quarterly bid auctions, we provide unmatched clarity into these app interactions. Powered by supervised AI, which blends advanced machine learning with human insights, we transform raw data into actionable strategies that resonate with user behavior and foster retention.

The Retention Radar equips marketers with insights to **decode app clusters, user engagement pathways, and retention drivers beyond conventional app categories**. By aligning with the hive-like movement of users, marketers can craft strategies that deliver sustainable growth and engagement.

**Welcome to 2025, where retention takes center stage.** With smarter strategies and deeper insights, you can cast a wider net to engage users across the entire App Hive and stay part of their regular routine.

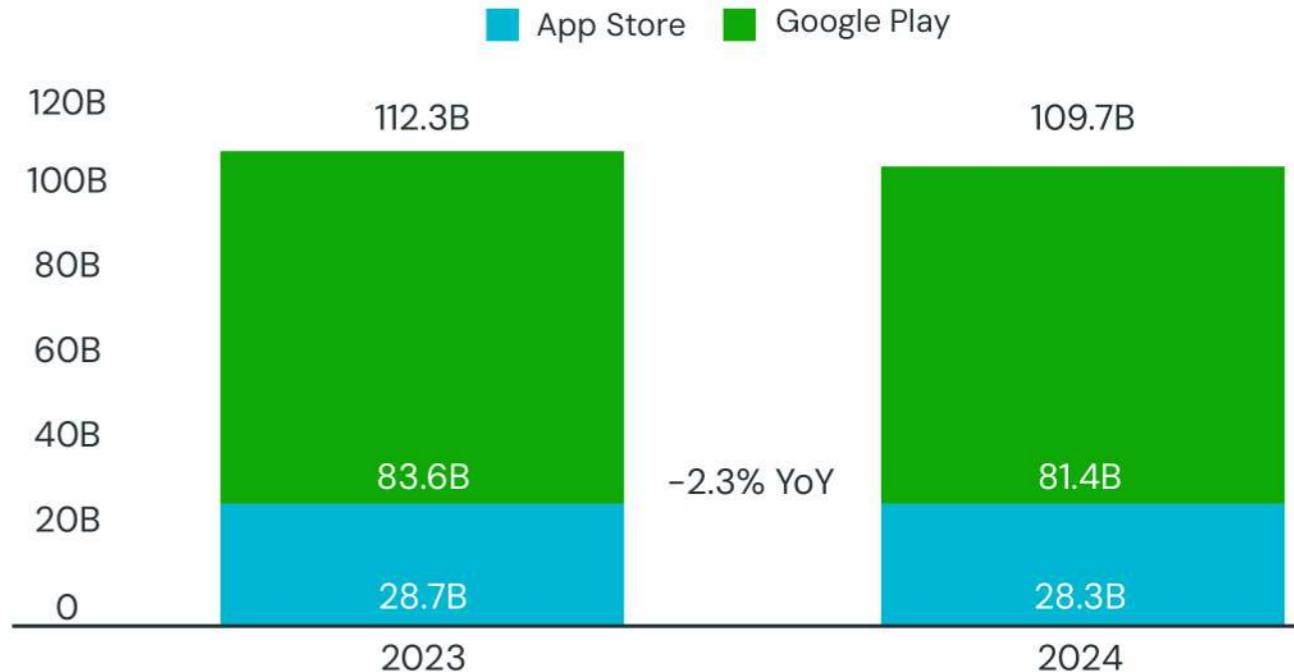
# Too Many Apps and Not Enough Buzz to Keep Users Engaged

## Competition is rising, installs are not – Retention is your advantage

- \$127 billion in consumer spending (2024), a 15.7% increase year-over-year.
- 2.3% decline in global app installs (iOS & Google Play) signals a maturing ecosystem.
- U.S. app downloads declined by 3.4% to 10.6 billion in 2024, showing static user growth.
- Since 2021, global gaming app downloads have dropped 6% YoY
- Only 5% of apps offer subscriptions, yet they account for 48% of all revenue.
- Globally, smartphone users explore 40 to 100 apps annually, but only 10 to 15 apps become daily staples.
- Devices typically hold 80 to 100 apps, making users uninstall unused apps and intensifying competition for user attention.

## Global Downloads of Mobile Apps

2023 – 2024 • Worldwide • App Store and Google Play



For marketers, this crowded and fragmented App Hive presents a clear challenge: How do you ensure your app stays not only visible but actively buzzing with engaged users?

# From Acquisition to Retention: Building a Flywheel for Lasting Growth

**Our analysis revealed that boosting user retention by just 10% can increase profits by up to 90%.** While acquisition brings users in, retention ensures they stay, engage, and drive long-term growth. The synergy between acquisition and retention creates a flywheel: engaged users convert into loyal customers, who then drive organic growth and amplify acquisition efforts.

## The Retention Flywheel in Action

Retention fuels sustainable growth by deepening engagement and unlocking cross-app opportunities. By analyzing synthesized cohorts, you can uncover patterns in user behavior across app categories, enabling targeted re-engagement campaigns that align with their habits. For example, users of a casual gaming app may also engage with shopping or music apps—strategic insights that drive both retention and acquisition simultaneously.



**Retention isn't just a complement to acquisition; it's the engine that magnifies its impact, transforming short-term wins into lasting success.**

# Unpacking the App Hive: Insights into Evolving User Preferences

As we navigate the intricate App Hive, a clear picture emerges of how user behaviors shape app categories. Within this digital ecosystem, certain segments act as anchor attractions, while others fulfill specialized needs, reflecting the diverse preferences of billions worldwide.

## Gaming: The Anchor of the Hive

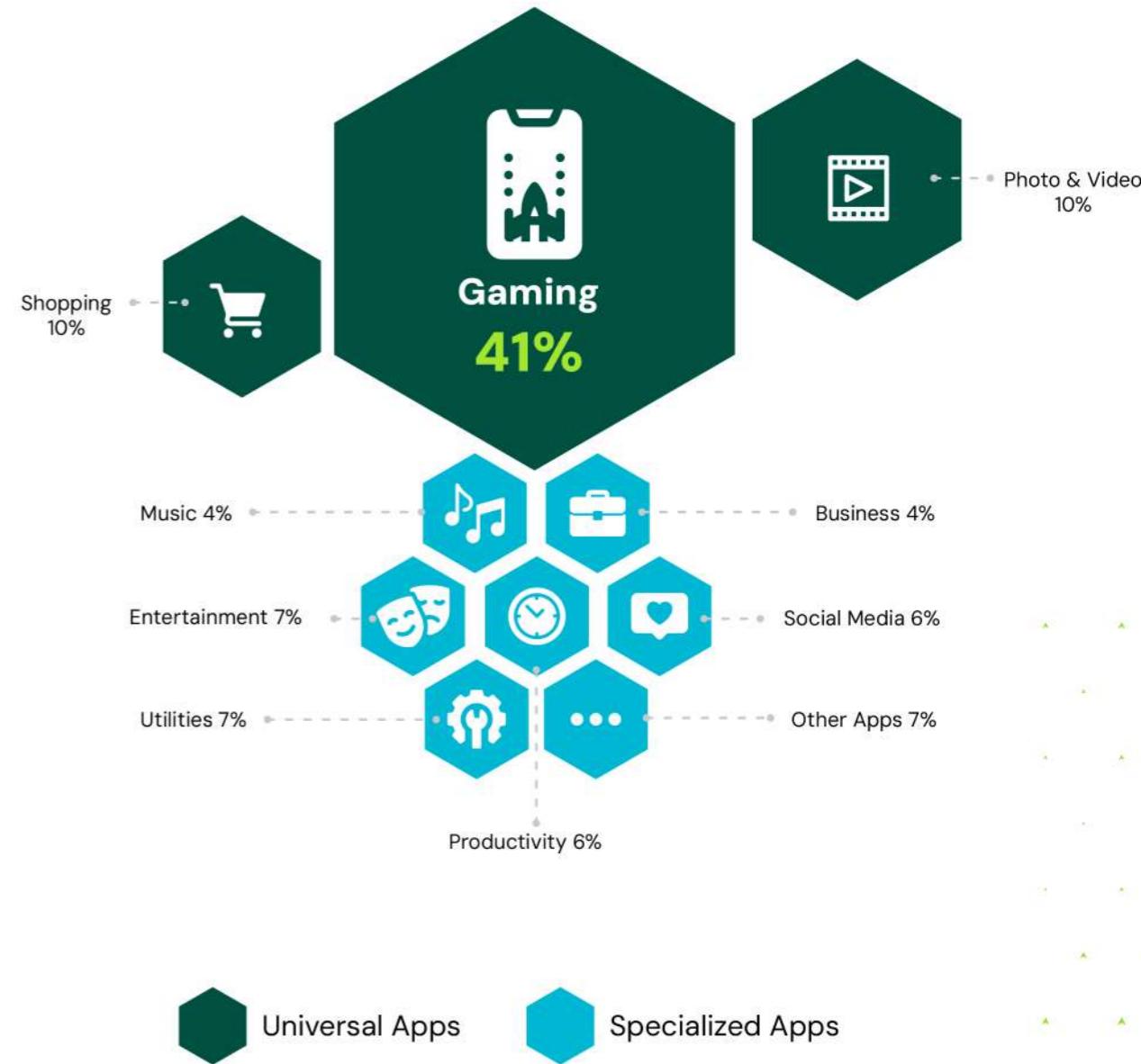
Gaming stands as the cornerstone of the App Hive, driving 41% of all downloads. Its unparalleled ability to engage users makes it attract a swarm of audiences and shape trends across the hive.

## Media & Commerce: The Hive's Buzzing Bazaar

Photo and video apps (10%) and shopping platforms (8%) are where users converge for universal needs like creativity and seamless shopping experiences.

## Essential Daily Use: The Hive's Steady Pulse

Entertainment, productivity, etc. (4–7% of downloads) power daily routines, meeting both functional and recreational needs with repetitive engagement.



# The “App Hopping” Experience: How High-LTV Users Navigate Their Demand Space

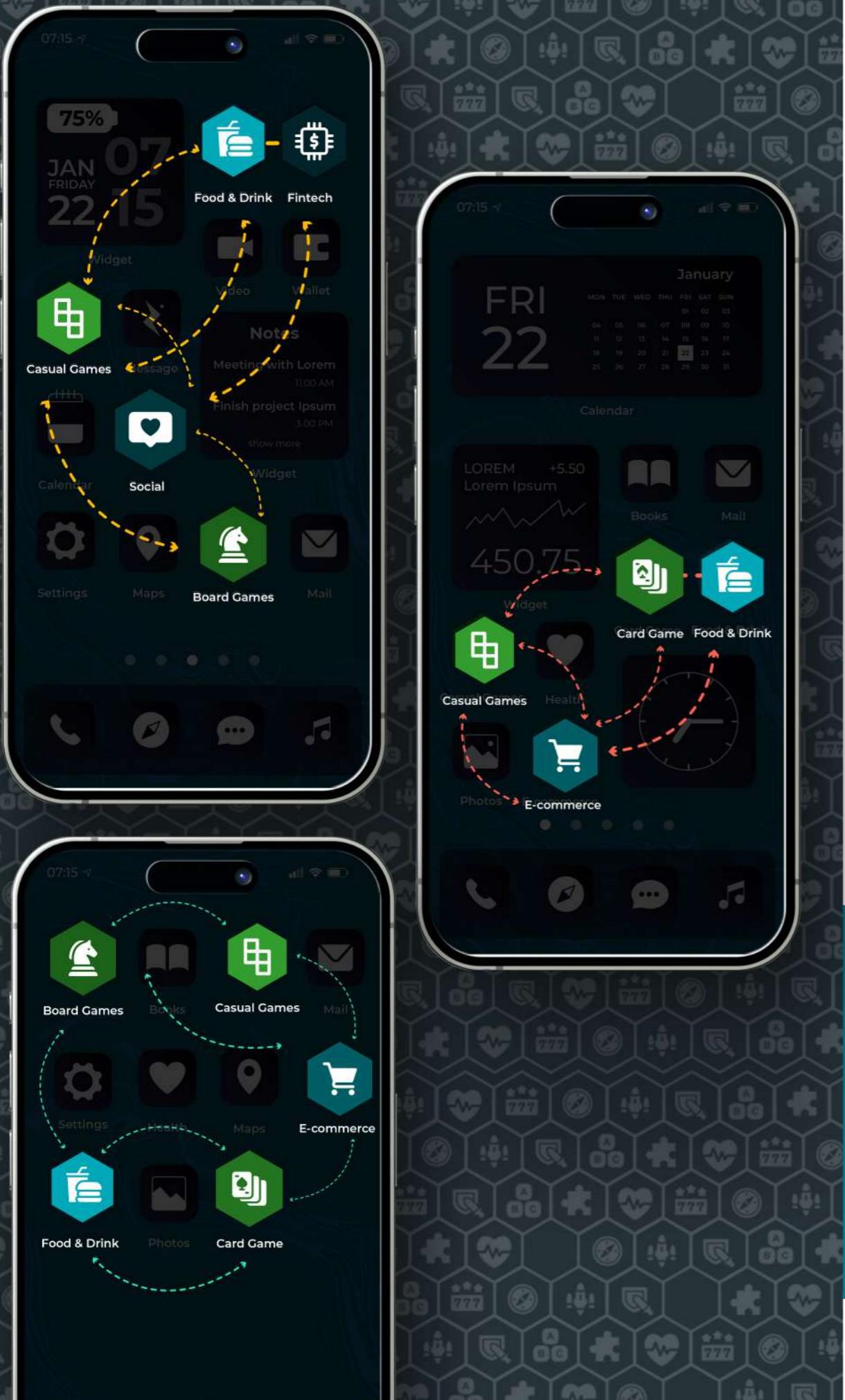
## What is a Demand Space<sup>1</sup>?

Demand Spaces are the frequently visited app destinations within the App Hive, places where users fulfill their emotional and functional needs. These spaces define app usage patterns, revealing purposeful “hopping” paths between categories as users gravitate to the apps that meet their needs.

High-LTV users, like bees in a hive, hop purposefully between apps to fulfill their emotional and functional needs. These movements create distinct pathways across app categories, revealing where value and engagement intersect.

For marketers, mapping these app-hopping flight paths reveals opportunities to align your app with key demand spaces, driving retention and maximizing LTV by meeting both emotional and functional needs.





# From Demand Spaces to Targetable Clusters: Mapping User Behaviors

## Pathways Reveal Patterns

Users frequently hop between apps across different demand spaces, forming distinct behavioral patterns. These interactions help identify clusters of apps that attract similar high-LTV users.

## App Clusters Enable Cohort Targeting

By mapping these pathways, we can define “app clusters” where users frequently engage. These clusters allow for more precise cohort-based targeting based on shared behaviors.

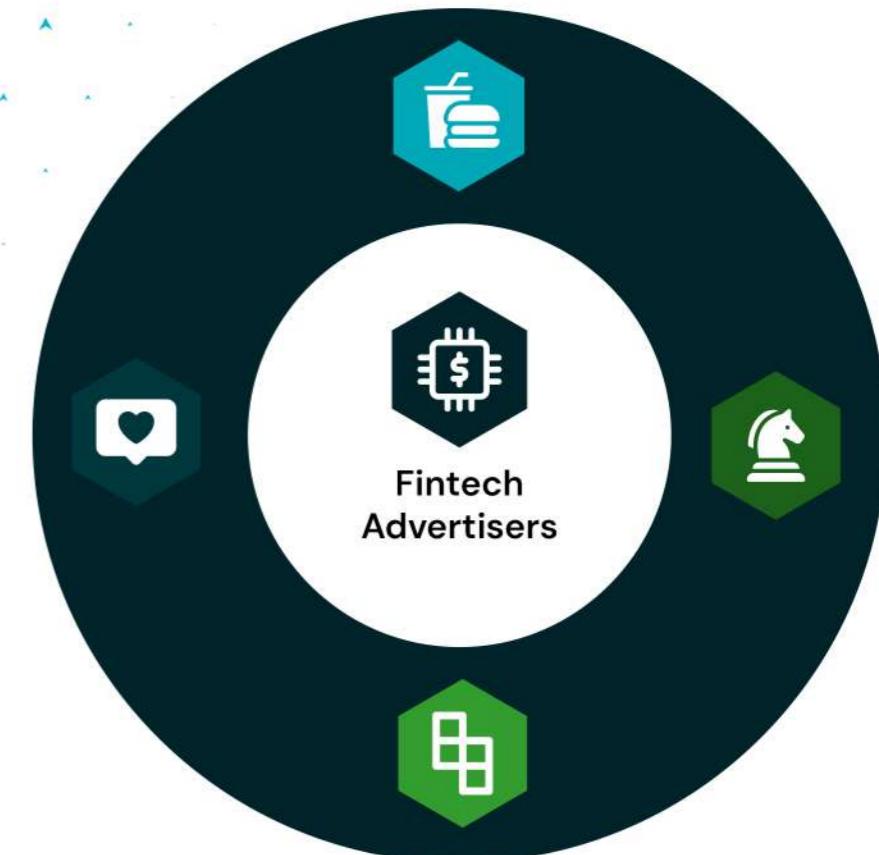
## The Advertiser's Opportunity

Understanding app clusters helps advertisers strategically position their campaigns, ensuring they reach the right audiences within high-value engagement networks.

# Aarki's Supervised-AI Refines Targetable App Clusters into "Synthesized Cohorts"

From an advertiser's perspective, a cluster of apps represents where their users frequently engage. These are the apps advertisers target to re-engage users and bring them back to their own app. **This targeted cluster forms a "synthesized cohort."** For every app category, a synthesized cohort reveals where high-LTV users can be effectively reached, enabling advertisers to optimize their targeting strategy.

Synthesized Cohort View



# App Stickiness Index: The North Star to Keep Your App Buzzing

**Understanding app-hopping pathways leads us to the App Stickiness Index.** Analyzing the apps' purposes, from functional to emotional needs, provides marketers critical insights into user behavior:

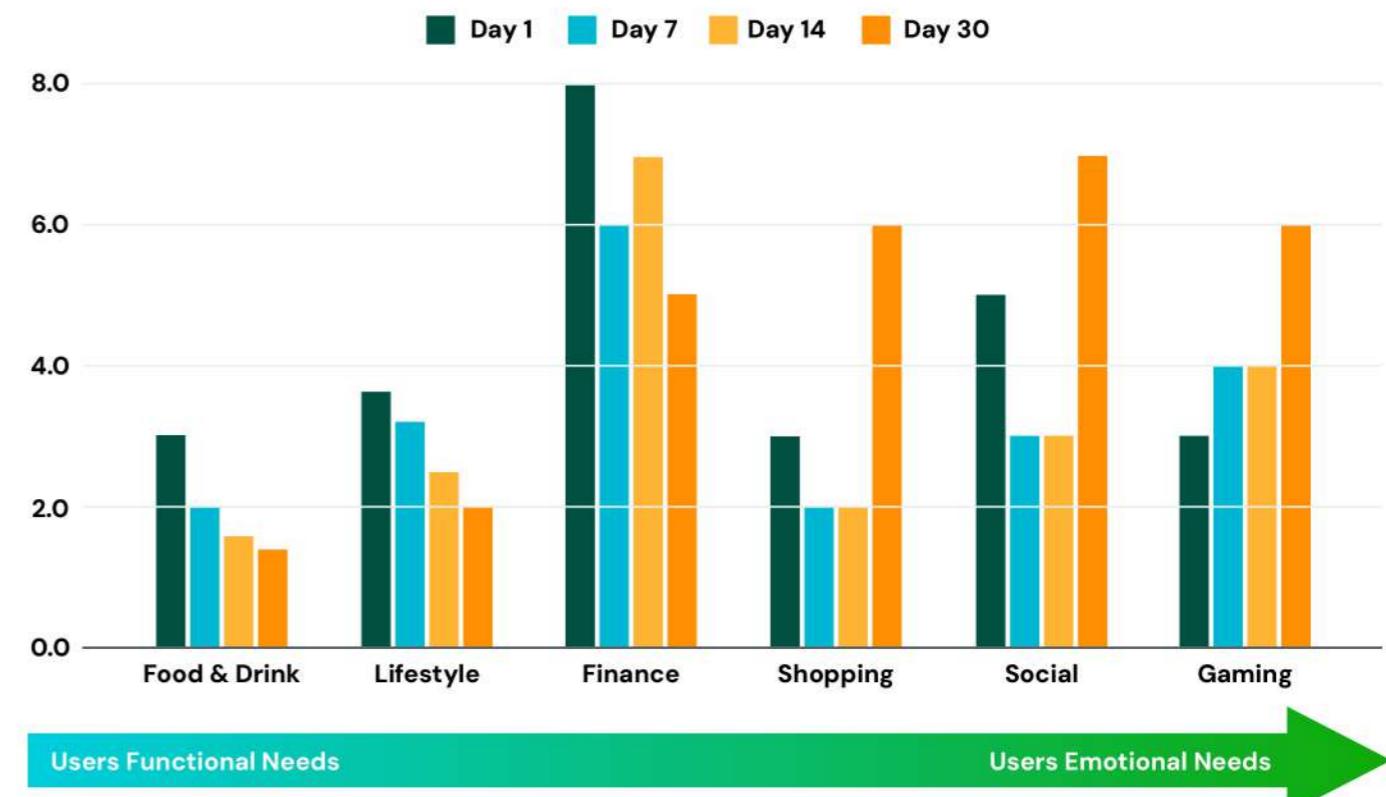
- 1** Apps addressing **functional needs** succeed in immediate engagement (high Day 1 stickiness) but struggle with retention beyond Day 7.

**Functional Needs Apps** (such as Food & Drink) exhibit high stickiness in the **early days** (Day 1 or Day 7) due to the urgency or necessity of their use cases but experience a decline over time.

- 2** Apps fulfilling **emotional needs** see slower initial engagement but build long-term loyalty (high Day 30 stickiness).

**Emotional Needs Apps** (such as Gaming, Social) demonstrate **progressive growth in stickiness**, peaking around Day 30, as these apps focus on habit-building, entertainment, or social connection to sustain long-term engagement.

**App Stickiness Index Score**



The App Stickiness Index captures how effectively an app keeps users engaged over time by measuring return rates at critical points: **Day 1, Day 7, Day 14, and Day 30**.

# Breaking Down the App Stickiness Index for Gaming Category

## High Stickiness Categories:

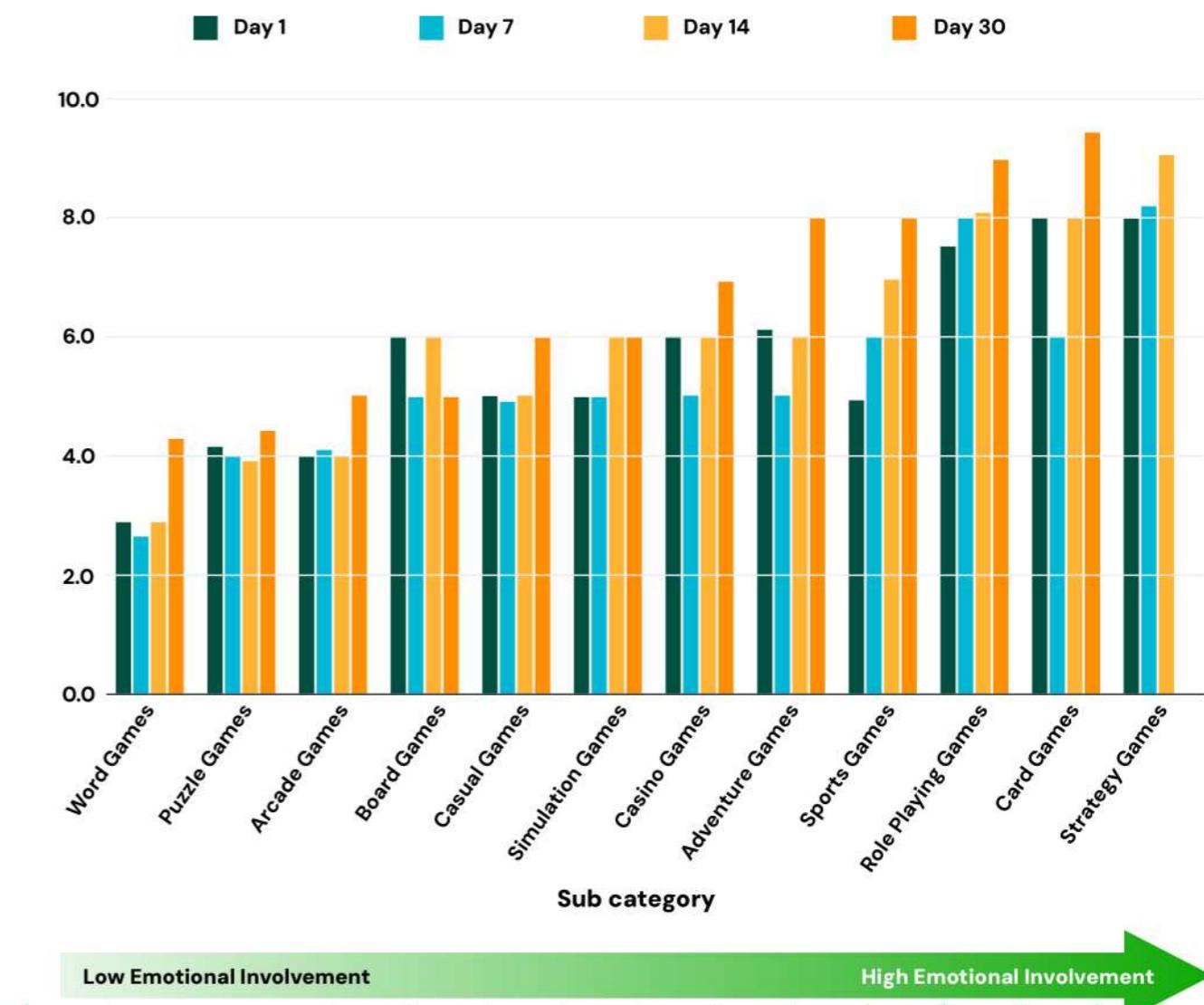
- Card Games and Strategy Games:** Consistently high stickiness across all days suggests sustained engagement, driven by emotional needs like mastery and competition
- Role-Playing Games:** High stickiness highlights deep emotional involvement, fueled by long-term gameplay progression, storytelling, and community-driven interactions

## Moderate Stickiness Categories:

- Adventure, Casino, Casual and Board Games:** Stickiness scores indicate steady but moderate engagement, influenced by a mix of excitement and habit-forming gameplay. Dips may occur due to repetitive content or unmet emotional needs.
- Sports Games:** Increasing stickiness over time reflects growing emotional investment as users master the game or participate in multiplayer or seasonal events.

## Low Stickiness Categories:

- Puzzle, Word and Arcade Games:** Persistently low stickiness suggests quick drop-offs in engagement, as simpler gameplay may fail to meet deeper emotional needs like achievement or social connection.



Gaming apps demonstrate higher stickiness compared to other app categories due to their focus on fulfilling emotional needs. **Within gaming, the graph above highlights the degree of emotional involvement players experience in each category.**

# Making the Connection To Drive Results

Understanding users' behavior within their synthesized cohorts presents marketers with strategic opportunities that enhance engagement and foster brand loyalty.

- **Track Complete User Journeys:** By monitoring the entire user journey across different apps, marketers can uncover how various apps complement each other. This holistic view allows for tailored marketing strategies that resonate with users'
- **Analyze Synthesized Cohorts:** Identifying distinct user groups based on their app interactions is a great enabler for personalization.
- **Optimize the Cohorts Using App Stickiness Index:** Recognizing which combinations of target apps, especially those with high stickiness index, lead to higher engagement and drive better app retention rates and ROAS.

- For instance, if you have a food & drink app with lower app stickiness, you can still win big. Start by targeting users from a high-stickiness app category, such as Casual Games, within your synthesized cohort.
- This creates opportunities for cross-category engagement and pathways to impressive and profitable retention.



# Decoding the Power of 'App-Hive' Insights for Smarter User Retargeting





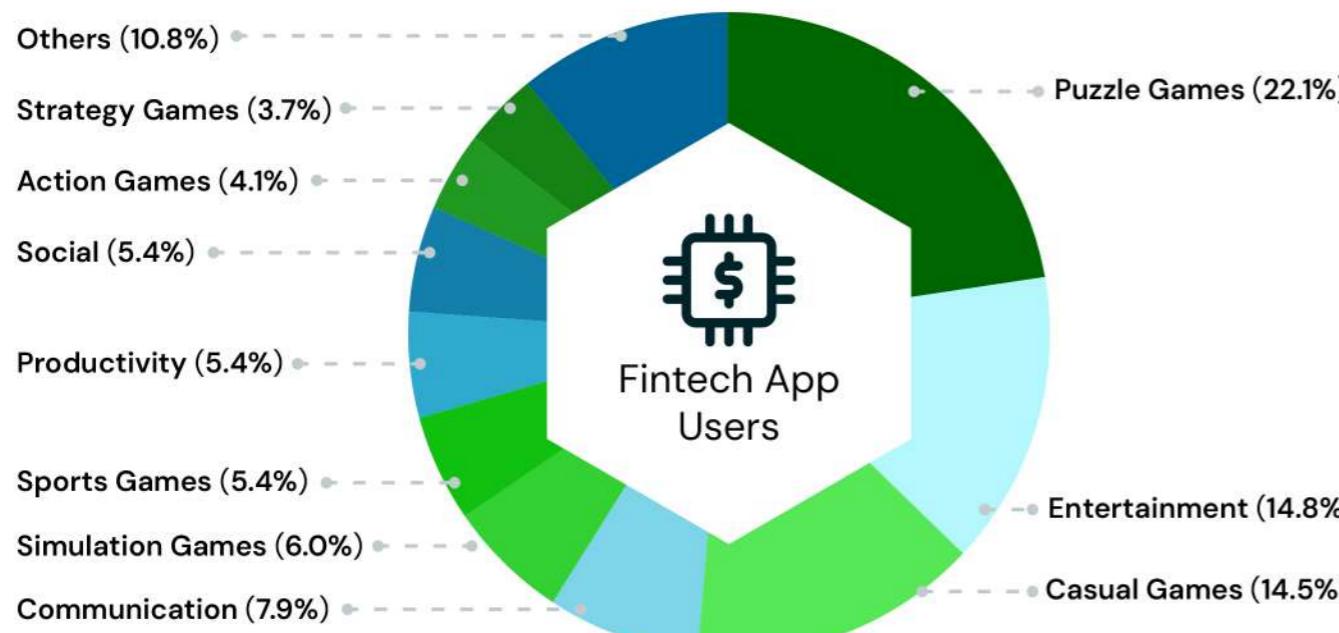
# Non-Gaming Apps

Synthesized Cohorts | Retention Rates & ROAS Insights | Recommendations



# Cash-in on High Interest in Casual Games

## Synthesized Cohort View



## App-solute Facts

Short videos (15–20 sec) and carousel ads that showcase financial tools and user benefits are the highest-performing creatives.



## Retention Rates & ROAS Insights

- A strong interest in all gaming genres:** 22.1% engage with puzzle games, and 35.5% explore other game genres.
- Non-gaming apps capture 44%:** Out of which, entertainment apps have a notable share of 14.8%.
- Early retention is strong, but drop-off occurs:** High D1 retention at 35.5% but significant drop-off by D7 (15.1%) and D14 (8.5%).

## Recommendations

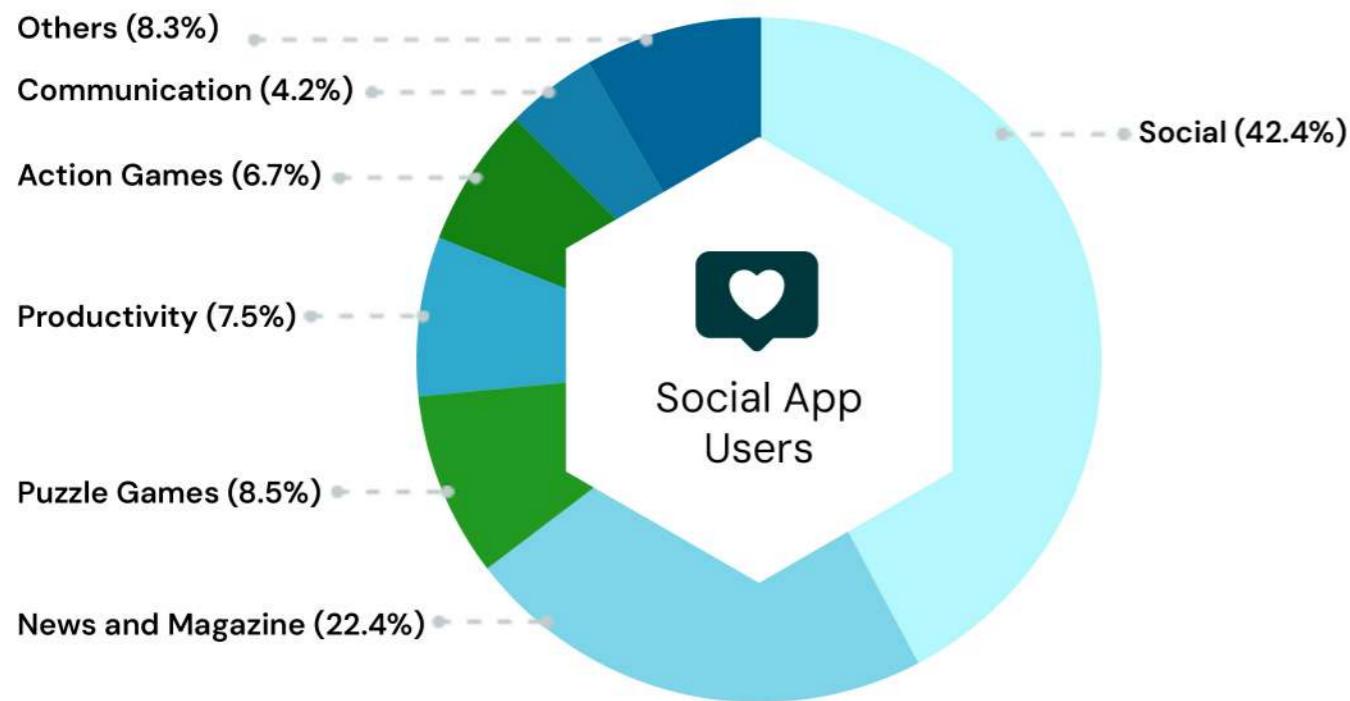
- Leverage entertainment app affinity:** Use entertainment app affinity (14.8%) to promote fintech offerings with engaging and contextually relevant ads.
- Tap into engaged gaming audiences:** Showcase investment or premium financial product ads during puzzle gaming sessions (22.1%) to tap into engaged audiences.
- Harness daily engagement hooks:** Introduce daily hooks such as personalized market trends, news updates, or interactive insights to sustain user interest over time.



## Social Media

# Tap Users Content Consumption Patterns, Watch ROAS Soar

## Synthesized Cohort View



Short video ads (6-15 seconds), influencer partnerships, and interactive ads like polls and quizzes drive strong user engagement.



## Retention Rates & ROAS Insights

- Non-gaming dominates engagement:** 76% of users engage in non-gaming activities, emphasizing their preference for content consumption such as news, lifestyle, or social.
- Gaming is a secondary interest:** 15.2% of users explore other gaming apps as their secondary interest.
- Short retention, strong ROAS:** Despite D1 retention of 28% dropping to 4% by D30, ROAS rises steadily, showing high ad engagement during users' brief but focused sessions.

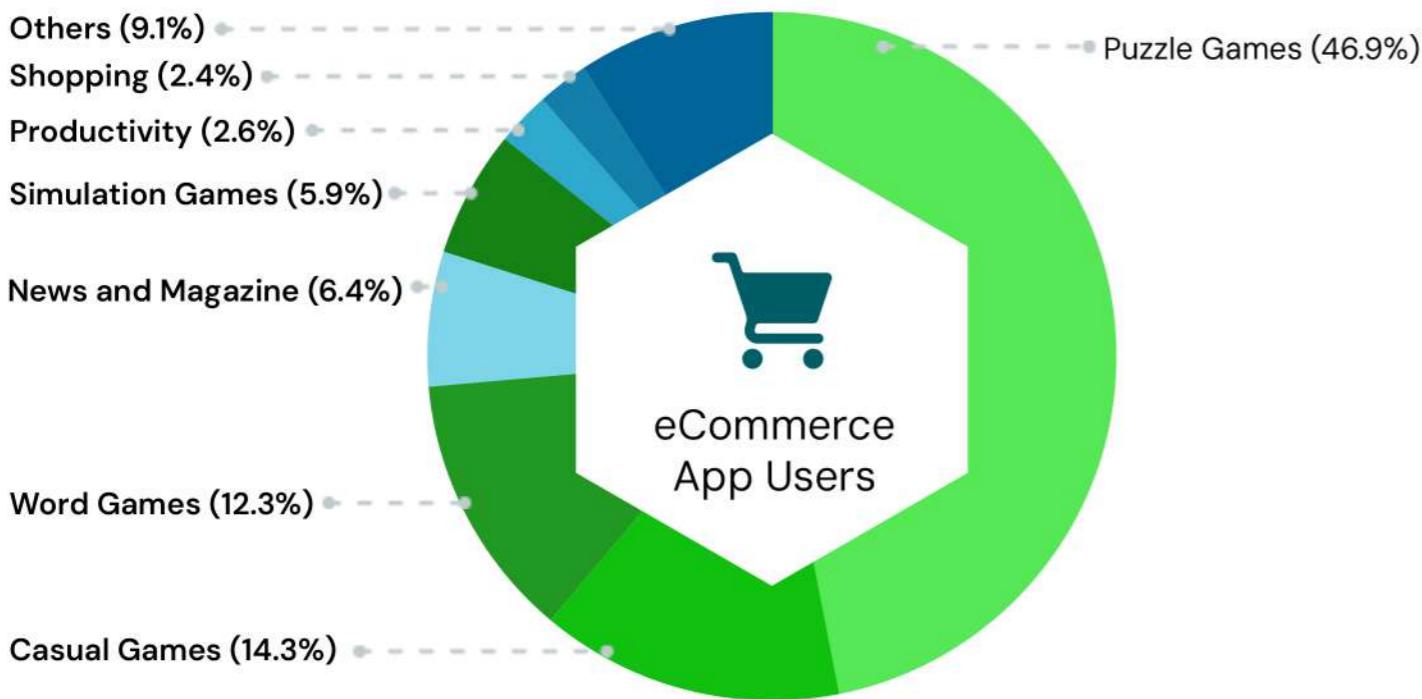
## Recommendations

- Target users' high activity within social apps (42.4%)** with interactive content that blends seamlessly into their scrolling experience.
- Capitalize on their content consumption:** Reach high LTV users on news and magazine apps (22.4%).
- Leverage native ad formats** that blend naturally with users' social app experiences, ensuring your content feels like part of their feed and increases engagement within D1-D7 windows.



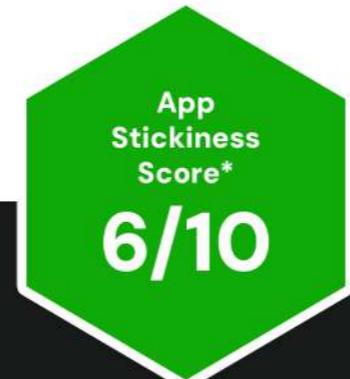
# Turn Gaming Breaks Into Shopping Spree

## Synthesized Cohort View



## App-solute Facts

Dynamic product ads, carousel formats showcasing multiple items, and short video ads drive the highest click-through rates.



## Retention Rates & ROAS Insights

- Affinity for Puzzle Games:** Nearly half (46.9%) of users engage with puzzle games, suggesting casual games are a popular downtime activity and a perfect fit with their shopping behavior.
- Exploration Beyond Gaming:** With 34.0% exploring a variety of other games and 19.1% engaging in non-gaming activities, users exhibit diverse interests, creating touchpoints for a variety of ad strategies.
- Retention and ROAS Trends:** High Day 30 activity among retained users contrasts with sharp D1 drop-offs. Gradual ROAS growth highlights the increasing value of efforts to engage users for the long term.

## Recommendations

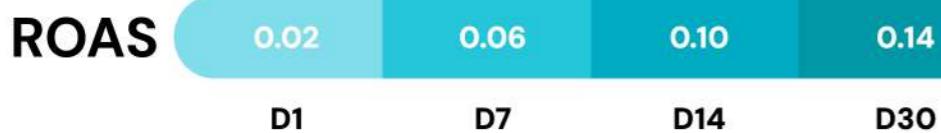
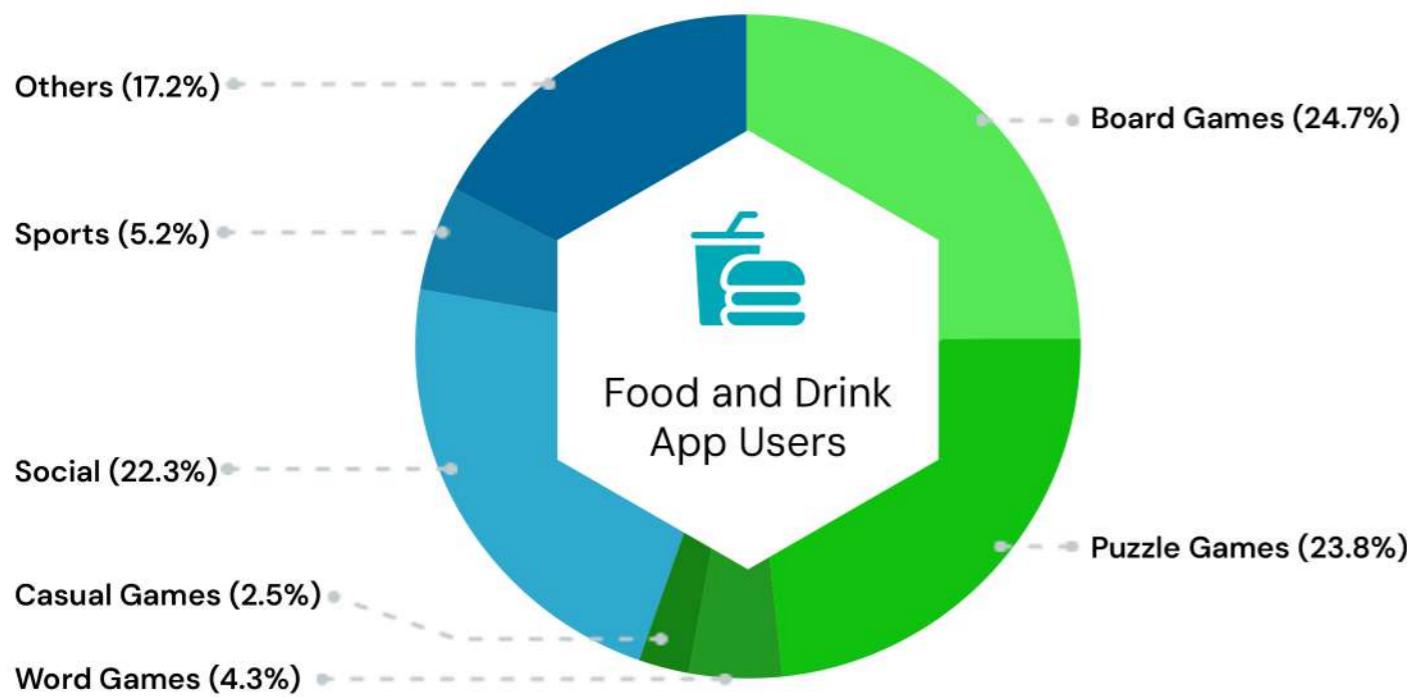
- Leverage gaming app affinity:** Target puzzle game sessions (46.9%) with tailored campaigns that align with users' shopping habits, maximizing engagement.
- Tap Non-Gaming Opportunities:** Utilize non-gaming apps (19.1%) to deliver product-focused ads in contexts primed for conversions.
- Boost Retention and Loyalty:** Cross-promote premium shopping apps during gaming sessions, use personalized ads to drive repeat visits.



## Food & Drinks

# Combine Real Food and Brain Food To Keep Users Hungry

## Synthesized Cohort View



## App-solute Facts

Short video ads (6-15 seconds) and interactive formats drive the highest click-through rates. Gamified experiences (e.g., rewards for completing challenges) enhance user interaction.



## Retention Rates & ROAS Insights

- Affinity for Strategy Games:** Nearly half (48.5%) of users hop to board games and puzzle games, indicating a preference for casual gaming content.
- Social Interaction as a Secondary Focus:** The 22.3% shift to social apps reflects a desire for connection and interaction.
- High Initial Retention, Declining Over Time:** Strong Day 1 retention (14.7%) is driven by immediate engagement needs, but limited long-term value leads to sharp drop-offs by Day 30 (1.8%).

## Recommendations

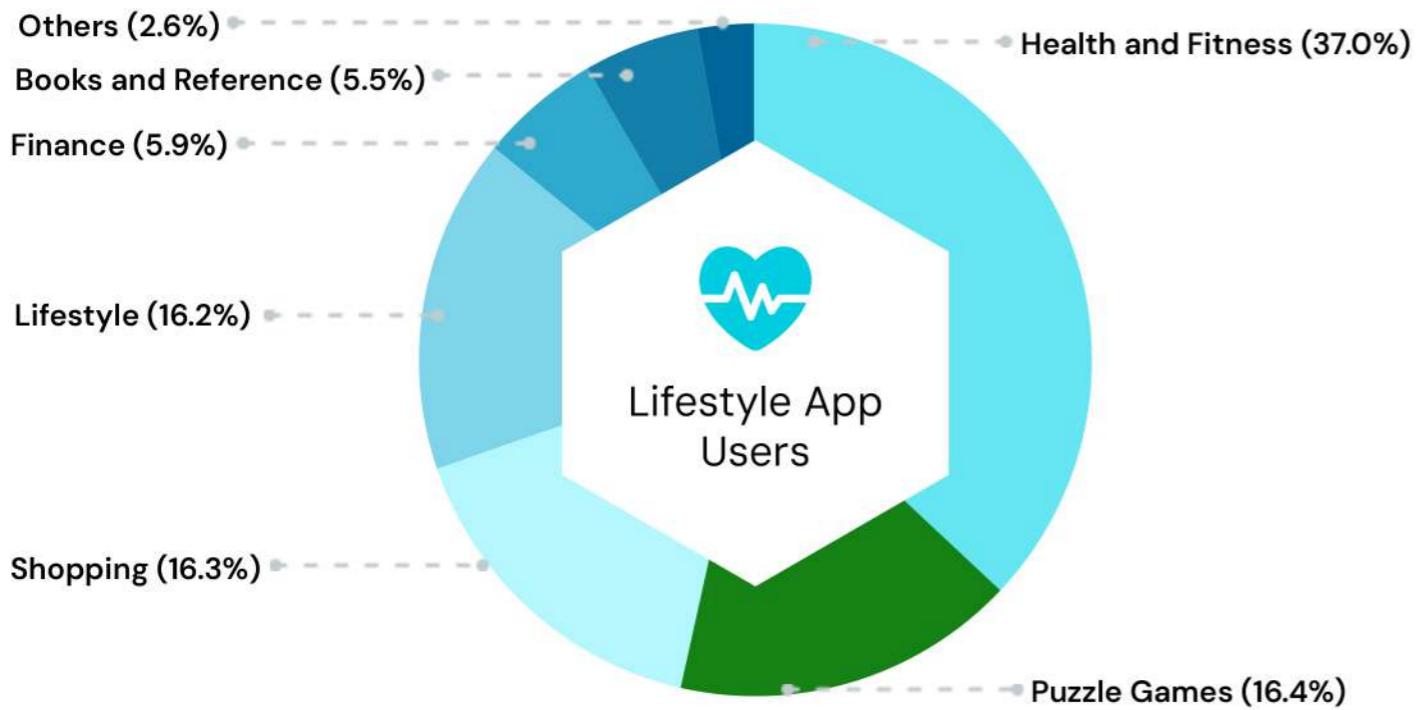
- Leverage social app affinity:** Target users in social apps (22.3%) with dynamic creatives that align with their need for relatable, community-driven messaging.
- Capitalize on strategic-led games:** Plan re-engagement campaigns during board (24.7%) and puzzle game (23.8%) sessions, tailoring ads to their affinity for mentally stimulating content.
- Use Dynamic Product Ads:** Showcase personalized product recommendations based on past orders, offering limited-time discounts to encourage repeat purchases and increase user loyalty.



Lifestyle

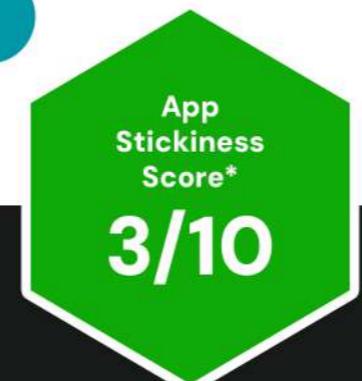
# Pump Up ROAS for Fitness Users with Puzzles and Loyalty Prizes

## Synthesized Cohort View



## App-solute Facts

Interactive ads, influencer-led campaigns, and immersive video formats generate the best engagement.



## Retention Rates & ROAS Insights

- Health and Fitness Dominates:** With 37% of users engaging with health and fitness apps, lifestyle app users show a strong inclination toward self-improvement and wellness.
- Limited Gaming Interest:** Only 16.4% engage with puzzle games, a notably lower percentage than in other app categories. This reflects a focus on practical, goal-oriented app usage.
- Retention vs. ROAS Dynamics:** While retention significantly drops by D30 (2.9%), a steady increase in ROAS indicates that users who remain are likely to engage deeply with premium content or monetized features over time.

## Recommendations

- Align with Wellness Goals:** Use cross-app campaigns in health and fitness (37%) to re-engage users with personalized ads promoting mindfulness features, goal tracking, or productivity tools.
- Capitalize on Puzzle Game Affinity:** Target puzzle game sessions (16.4%) with lifestyle app ads that offer relaxing, task-oriented activities to complement their focused behavior.
- Leverage video ads:** Showcase real-life transformations of wellness tips to engage health-focused users and seamlessly integrate with their goal-oriented routines.



# Gaming Apps

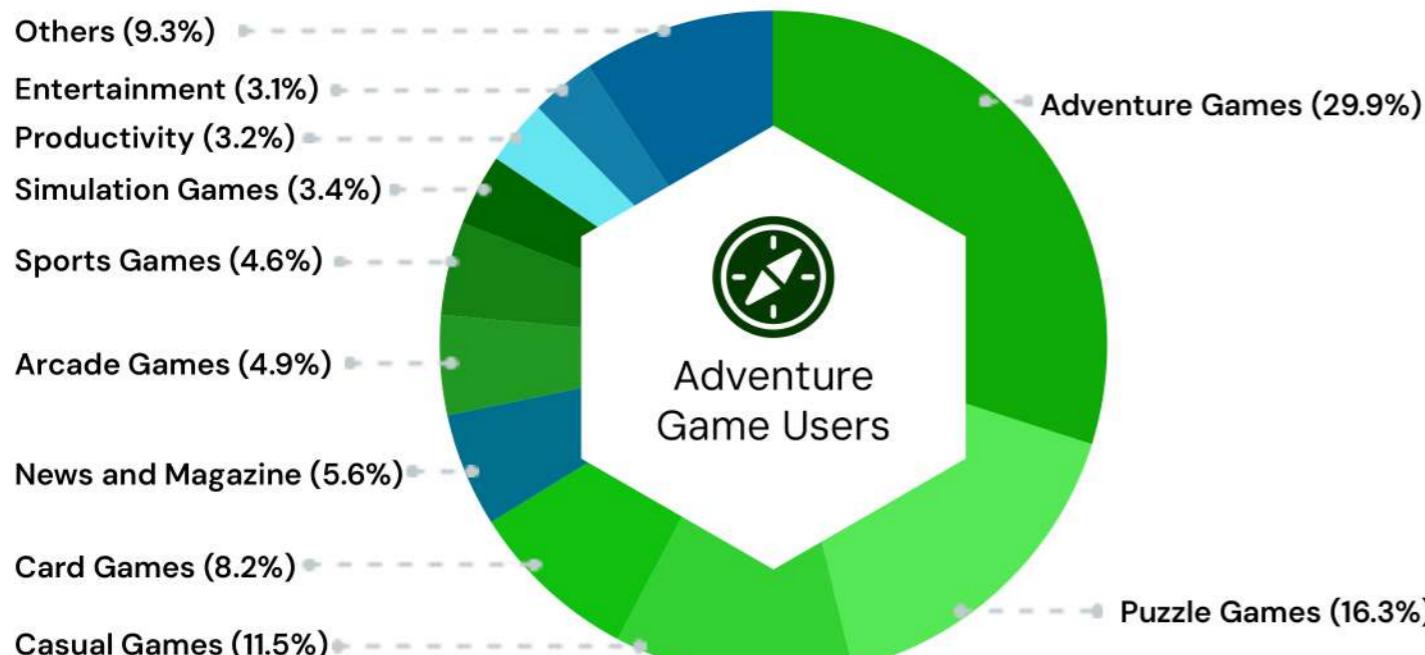
Synthesized Cohorts | Retention Rates & ROAS Insights | Recommendations



## Adventure

# Explore Storylines and Cross-Category Ads to Engage Adventure Gamers

## Synthesized Cohort View



## App-solute Facts

Immersive gameplay resonates most with adventure gamers, and the gradual rise in D30 ROAS indicates their interest grows as they progress through the game, unlocking premium features.



## Retention Rates & ROAS Insights

- Strong Intra-Genre Engagement:** Nearly 30% of users transition to other adventure games, highlighting their preference for this genre. Puzzle games (16.3%) and casual games (11.6%) also resonate with them.
- Exploration Beyond Gaming:** Notable engagement with news (5.6%) and productivity apps (3.2%) reveals cross-category ad opportunities.
- Retention vs ROAS Dynamics:** D1 retention is 10.3% and D30 is 2.6%. However, the gradual rise in D30 ROAS reflects players' growing investment as they unlock premium content and progress through the narrative.

## Recommendations

- Optimize Genre-Specific Ads:** Focus on immersive, storyline-driven ads that target adventure (29.9%) and puzzle (16.3%) game players.
- Expand Cross-Category Reach:** Retarget on non-gaming platforms like news and magazines (5.6%) to connect with users seeking an escape from routine, presenting your game as the perfect diversion.
- Promote Premium Unlocks:** Emphasize the value of in-game purchases tied to premium content or advanced gameplay, leveraging the gradual increase in D30 ROAS to maximize revenue.



## Arcade

# Win Over Arcade Gamers with Dynamic Creatives and Tailored Rewards

## Synthesized Cohort View



## App-solute Facts

Rewarded video ads see a 25% higher engagement compared to other formats, aligning with the fast-paced nature of arcade gaming.



## Retention Rates & ROAS Insights

- High Genre Loyalty:** The strong engagement within arcade games (22.3%) highlights the need to create tournaments, leaderboards, and skill-based incentives to deepen loyalty and keep users returning.
- Time-Based Engagement:** Identify peak gaming times to deliver targeted ads and timely push notifications, enhancing user engagement and monetization opportunities.
- Retention vs. ROAS Dynamics:** High D1 retention (17.2%) suggests a strong hook. Use onboarding experiences, engaging tutorials, and early rewards to keep users engaged beyond the first day.

## Recommendations

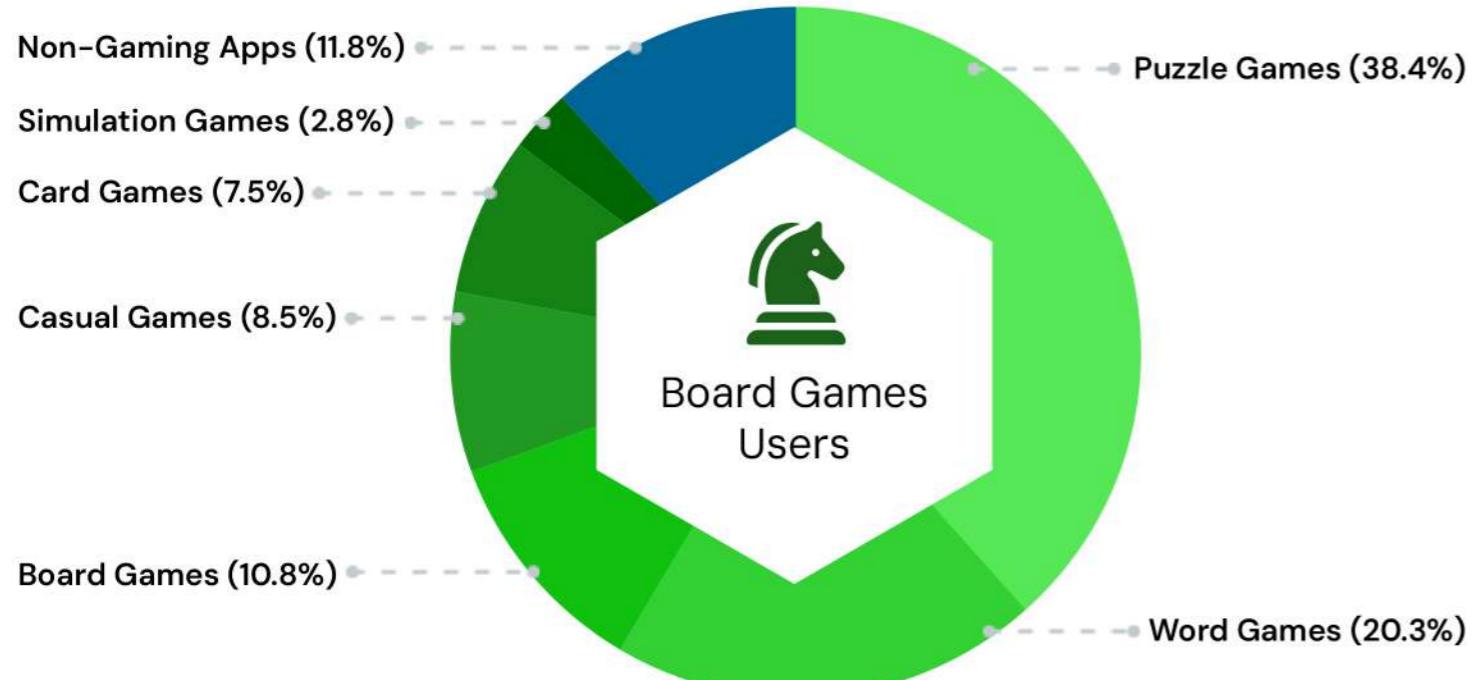
- Leverage Cross-Promotion with Puzzle Games:** With 54% of users also engaging with puzzle games, promote your arcade titles within puzzle game sessions using ads that emphasize challenging and skill-based gameplay.
- Explore Secondary Interests:** Expand ad placements to casual games (12.9%) and entertainment apps (7.6%) to attract users with similar preferences for light and engaging content.
- Maximize ROAS Growth:** With ROAS rising between D14 and D30, roll out premium in-game offerings like boosters, skins, exclusive levels after players have become invested in the game.



## Board Games

# Level Up Board Game Engagement by Showcasing Themed Content and Timely Perks

## Synthesized Cohort View



Rewarded Ads perform well, particularly when tied to earning in-game rewards, achieving a 30% higher engagement rate than static ads.

## App-solute Facts

## Retention Rates & ROAS Insights

- Strong Cross-Genre Linkage:** Puzzle games (38.4%) and word games (20.3%) show high user affinity, driven by their strategic depth and engaging challenges.
- Diverse Interests:** Nearly 12% (11.8%) of board game users actively engage with non-gaming apps, suggesting they are also active on productivity and entertainment apps.
- Retention and ROAS Dynamics:** The sharp rise in D30 ROAS reflects board game players' increasing willingness to invest in premium experiences over time, underscoring their loyalty and appreciation for deeper gameplay value.

## Recommendations

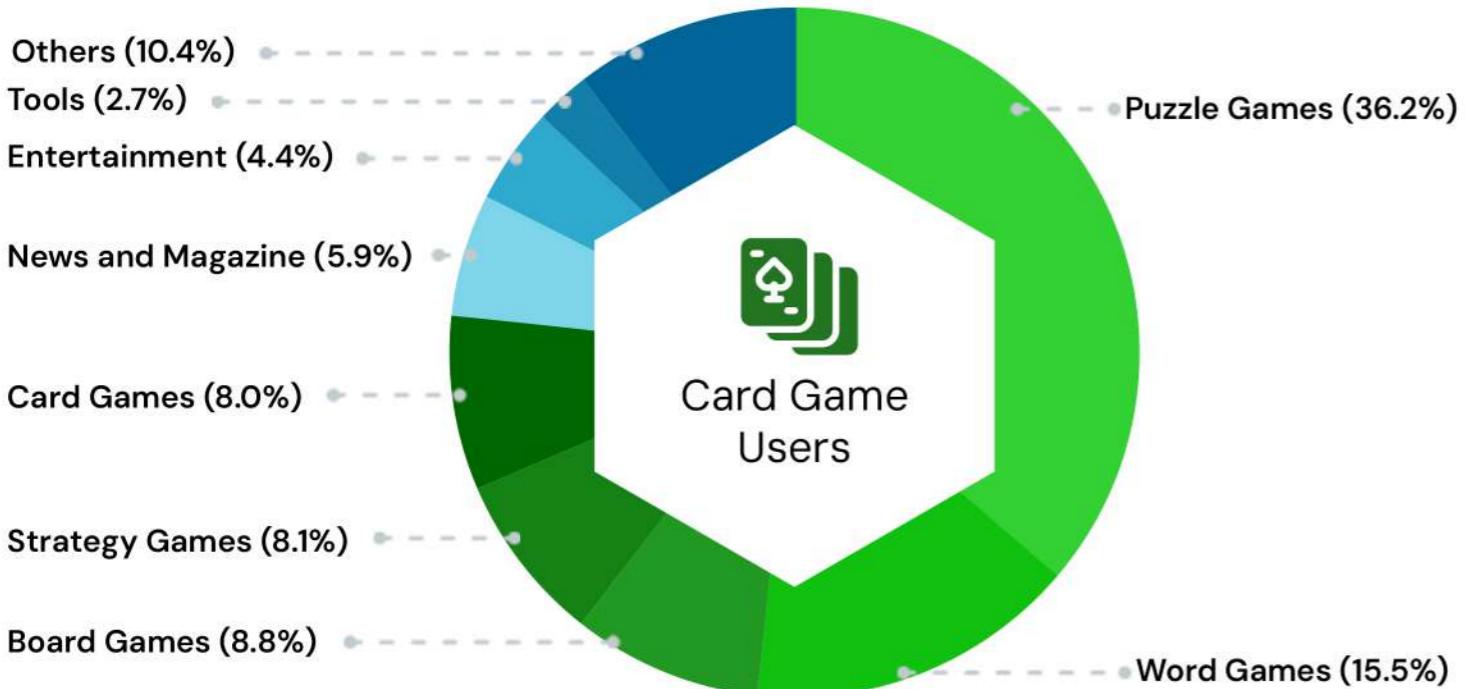
- Leverage Non-Gaming App Activity:** Deploy dynamic ads in non-gaming apps, promoting board games as engaging downtime activities.
- Social Engagement as a Driver:** Multiplayer features and online leaderboards enhance user stickiness, with games that allow friend invites seeing 20% higher retention than solo-play options.
- Maximize Retention Metrics:** D1 retention averages 15.8%, with a steady drop-off leading to D30 retention at 4.2%. However, players who stay past D7 are significantly more likely to engage long-term.



## Card Games

# Deal Card Gamers Cross-Genre Ads and Unlock Tournament Wins

## Synthesized Cohort View



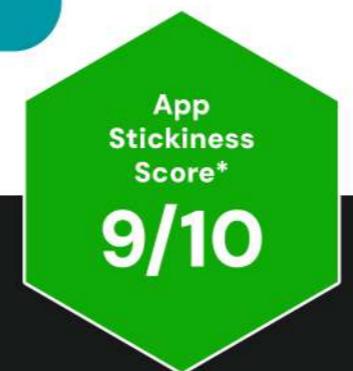
## ROAS

0.11	0.27	0.43	0.69
D1	D7	D14	D30



## App-solute Facts

Rewarded Ads drive 35% higher CTR and are highly effective during game pauses, generating high impressions without disrupting gameplay.



## Retention Rates & ROAS Insights

- Balanced Gaming Preferences:** Card game users' equal interest in puzzle games (39.2%) and other gaming types (40.8%) reflects their strong appetite for diverse yet mentally stimulating gameplay experiences.
- Exploration Beyond Gaming:** Non-gaming activities (14%) highlight opportunities to re-engage users outside gaming sessions with premium ads that resonate with their broad interests.
- High Long-Term Value:** A sharp increase in ROAS from D14 to D30, coupled with high D30 engagement, demonstrates the strong monetization potential of card game users, especially long-term players.

## Recommendations

- Leverage Cross-Genre Appeal:** Promote diverse card game offerings during puzzle and other gaming sessions (49.8%) to capture users' interest in strategic and diverse gameplay.
- Retarget Beyond Gaming:** Users spend significant time (14%) in non-gaming apps. Use this opportunity to showcase premium card game features through highly tailored ads on news or lifestyle apps.
- Drive Long-Term Revenue:** Capitalize on growing D30 engagement by introducing exclusive in-game purchases, such as themed card packs, customizable modes, or multiplayer tournaments, to foster loyalty and enhance monetization.



## Casino Games

# Bet Big on Card Games, Puzzle Games, and Board Games to Re-engage Casino Gamers

## Synthesized Cohort View



## App-solute Facts

Rewarded video ads drive 35% higher CTR and are highly effective during game pauses, generating high impressions without disrupting gameplay.

## Retention Rates & ROAS Insights

- Diverse Gaming Interests:** Casino players frequently engage with card (33.3%), board (25.9%), and puzzle (24.3%) games. This indicates a strong crossover appeal to strategic and engaging game types.
- Non-Gaming Opportunities:** With 9.4% of user activity occurring in non-gaming apps, there is untapped potential for reaching casino players during their downtime with ads for premium casino experiences.
- Retention-ROAS Disconnect:** While Day 30 retention (2.7%) among casino players is solid, the moderate growth in ROAS highlights an opportunity to drive early campaign budgets or increase the monetization value of retained users.

## Recommendations

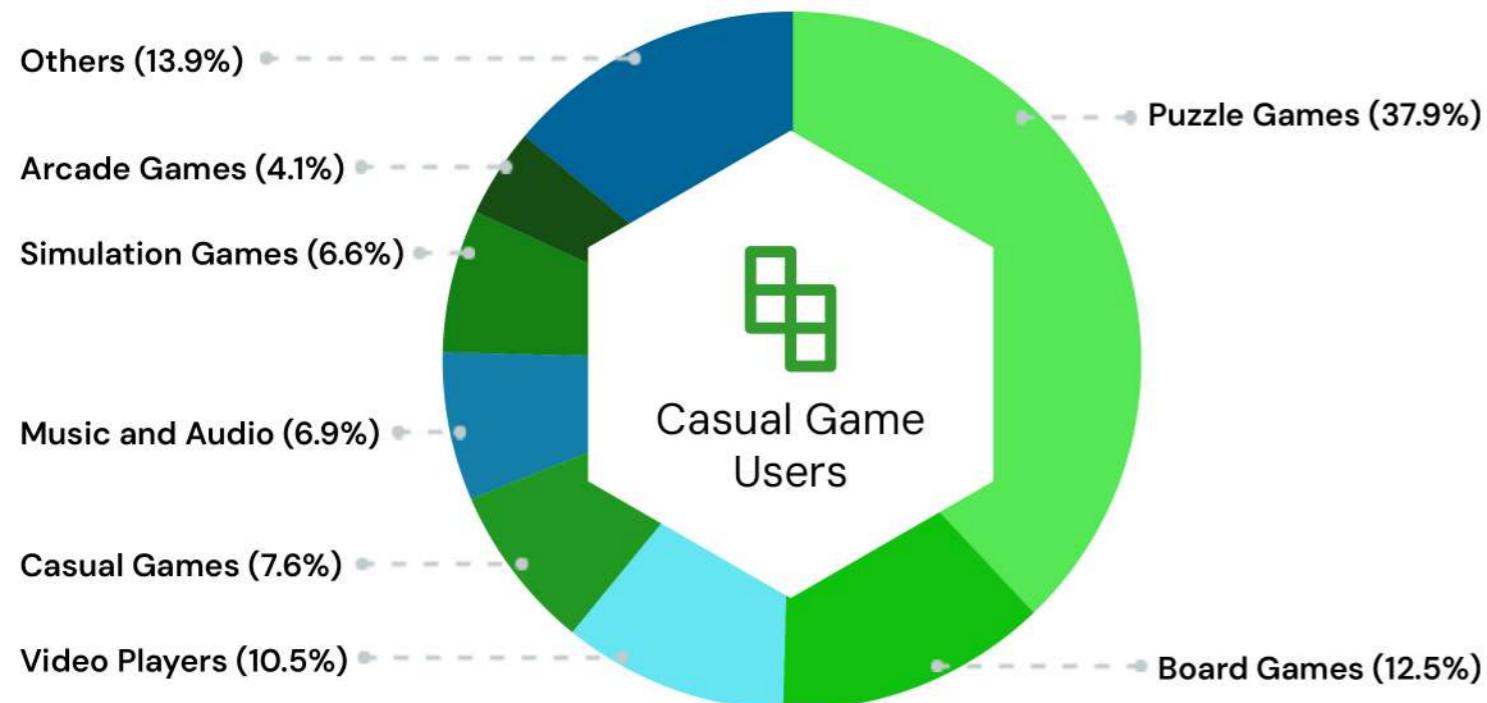
- Target Card Game Sessions:** Retarget card game users (33.3%) to promote casino games with similar themes, such as poker or blackjack, to capitalize on players' familiarity.
- Cross-Promote in Board Games:** Utilize strategic placements in board game sessions (25.9%) to highlight casino games with elements of planning and strategy, enhancing appeal to this audience.
- Engage During Non-Gaming Activity:** Place dynamic creatives in non-gaming apps (9.4%), such as productivity or entertainment, to promote premium casino features like VIP memberships or exclusive game modes.



## Casual Games

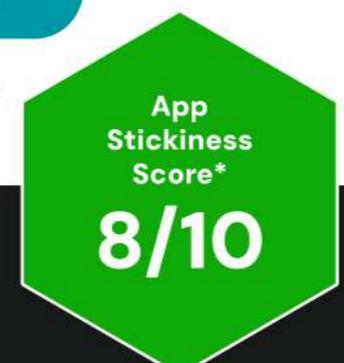
# Tap Into Leisure Time Activities to Keep Casual Gamers Hooked

## Synthesized Cohort View



## App-solute Facts

Rewarded Ads drive 35% higher CTR and are highly effective during game pauses, generating high impressions without disrupting gameplay.



## Retention Rates & ROAS Insights

- Strong Puzzle Affinity:** Casual players show a significant interest in puzzle games (37.9%), underlining a strong appetite for relaxing yet mentally engaging gameplay.
- Non-Gaming Diversion:** Categories like video apps (10.5%) and music/audio apps (6.91%) highlight opportunities to engage these users outside the gaming context.
- Retention Rates Reflect Intense Competition:** The steep drop in retention from D1 (7.4%) to D30 (1.7%) is dramatic, proving casual gaming is a fiercely competitive space where users are quick to lose attention and explore alternatives.

## Recommendations

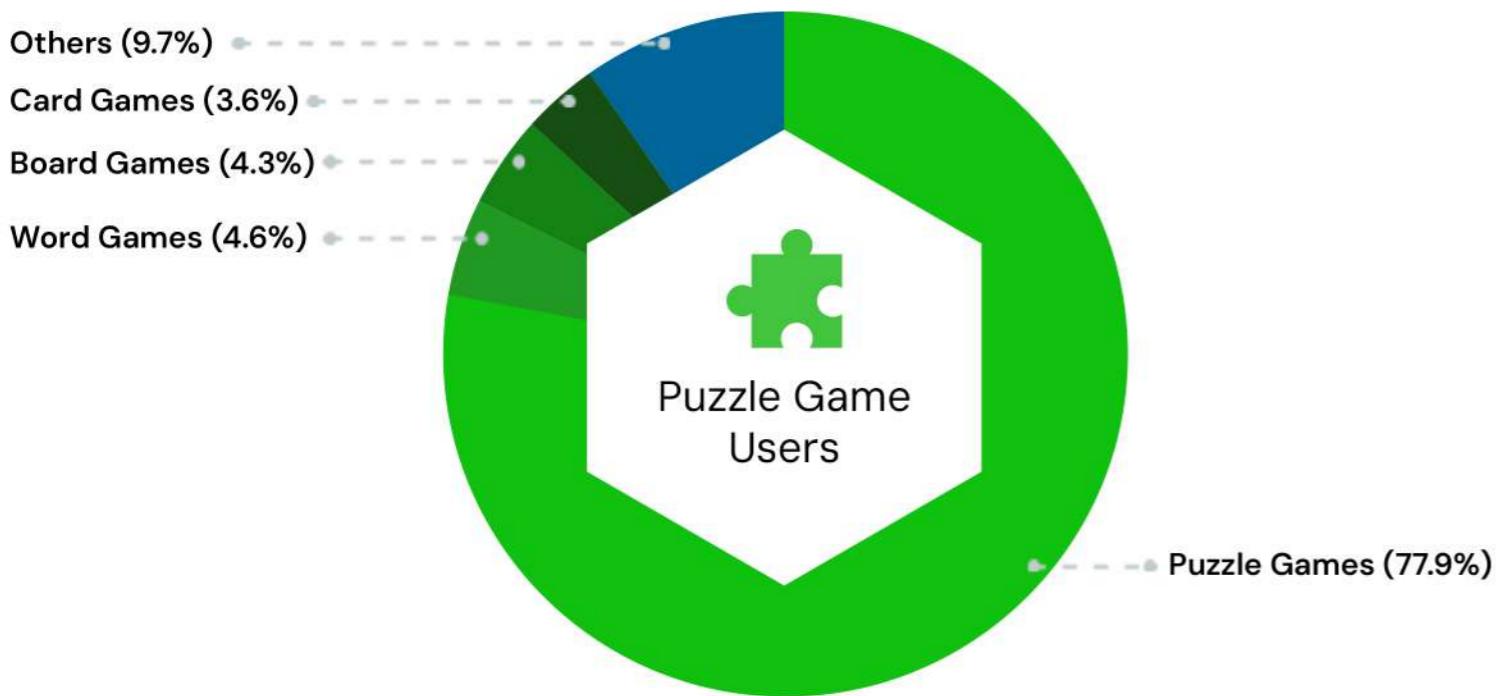
- Reach Users in Entertainment Apps:** Targeting users on their video (10.5%) and music/audio (6.9%) apps is the perfect timing to promote casual games as a source of downtime entertainment.
- Incentivize Long-Term Play:** Promote exclusive in-game rewards or seasonal content that enhances progression and narrative, motivating Day 30 players to invest further.
- Leverage Social Features:** Ads should highlight social elements, such as team challenges or community-driven events, to enhance the immersive appeal of casual games and improve ROAS through collective participation.



## Puzzle Games

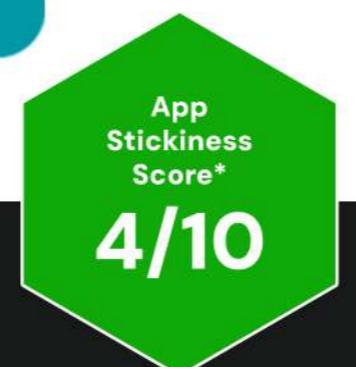
# From Puzzle to Profit - Boost ROAS with Diverse Ad Formats

## Synthesized Cohort View



## App-solute Facts

Rewarded Ads that offer hints or power-ups result in a 20% increase in D7 retention.



## Retention Rates & ROAS Insights

- Strong Genre Loyalty:** The majority (77.9%) of users engage with other puzzle games, reflecting their preference for familiar, mentally engaging gameplay.
- Limited Non-Gaming Exploration:** Only 5.7% of users interact with non-gaming apps, suggesting minimal but valuable opportunities for targeted ads outside gaming contexts.
- Retention and ROAS Dynamics:** With D1 retention at 8.6% and dropping to 1.6% by D30, this genre experiences high churn as users frequently switch between titles. This behavior mirrors trends in casual games, where engagement and users' attention spans tend to be low.

## Recommendations

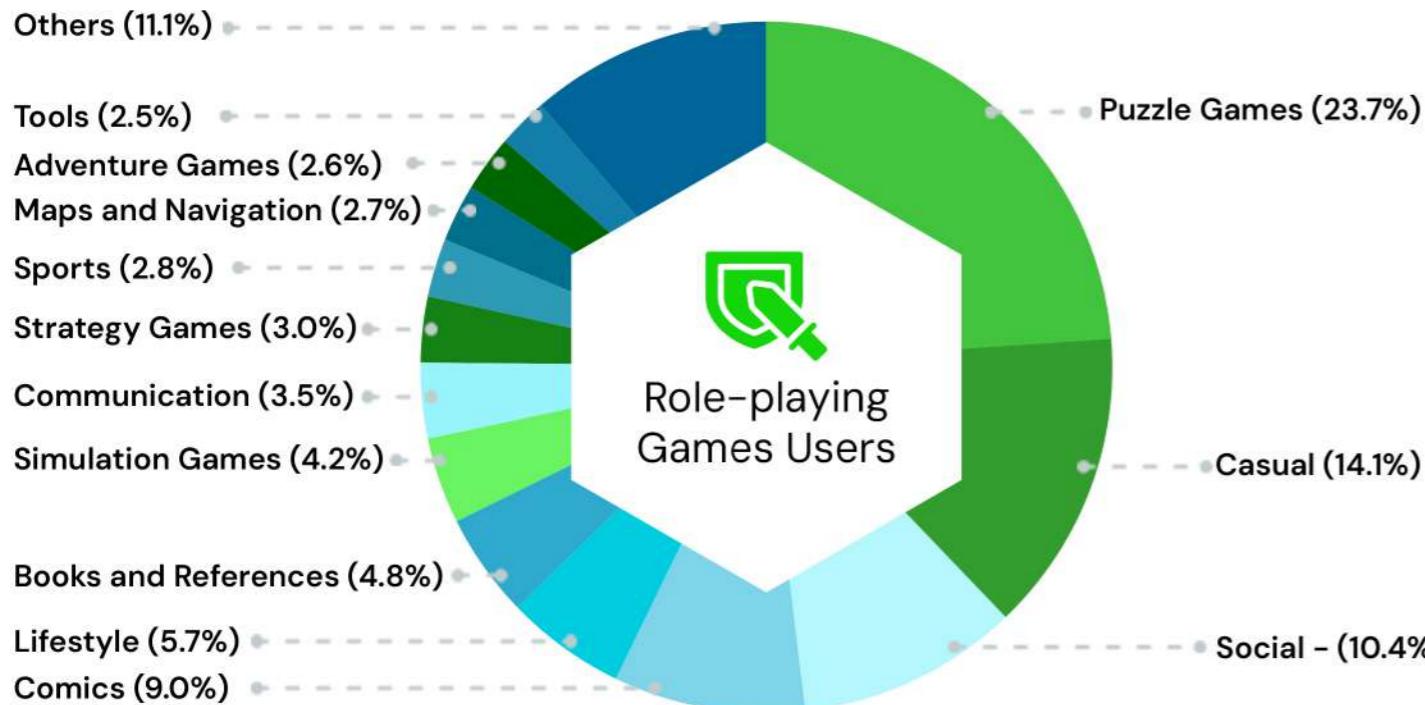
- Cross-Promote in Puzzle Genre:** Target players during sessions with other puzzle games (77.9%) through dynamic ads.
- Expand to Word Game Players:** Leverage the 16.4% crossover with word games by diversifying ad placements.
- Strategic Non-Gaming Placements:** Many puzzle game players (30%) also engage with strategy and brain-training apps, suggesting opportunities for retargeting.



## Role Playing Games

# Heroic Engagement, Legendary Returns— Boosts Retention in RPGs!

## Synthesized Cohort View



## App-solute Facts

Playable Ads drive a 45% higher CTR and a 30% higher conversion rate when retargeting previously installed players, leading to increased in-app purchases.



## Retention Rates & ROAS Insights

- Non-Gaming Dominance:** RPG players show the highest engagement with non-gaming apps at 40.2%, indicating a broad interest in digital content beyond games.
- Genre Overlap:** Players spend time in puzzle games (23.7%) and social apps (10.4%), suggesting crossover appeal to other genres and community-driven experiences.
- High Stickiness, Gradual ROAS:** RPGs retain users well (15.8% D1, 3.9% D30), but slow ROAS growth indicates players take longer to convert.

## Recommendations

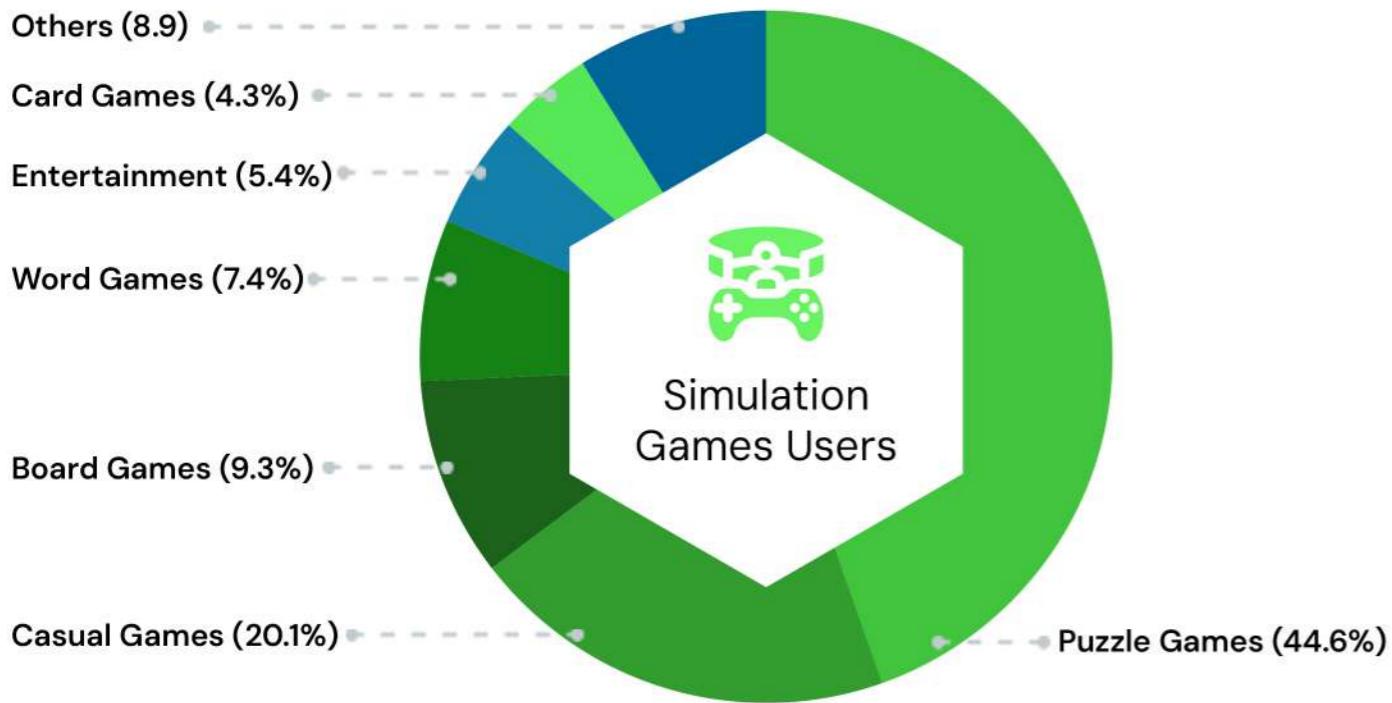
- Leverage Non-Gaming Time:** Engage users during their non-gaming app sessions with casual RPG experiences or in-app purchase promotions to spark interest.
- Capitalize on Social App Usage:** Promote RPG community features like guilds and multiplayer modes through social apps to foster player connections and boost engagement.
- Target Puzzle Game Sessions:** Use dynamic ads during puzzle gameplay to showcase engaging RPG content, encouraging users to explore new narratives and drive installs.



## Simulation Games

# Keep Simulation Players in the Game with Bonuses and Progression Boosts

## Synthesized Cohort View



## App-solute Facts

Playable Ads make the gameplay experience 1.7x more engaging, while Carousel Ads effectively showcase diverse features or premium items.



## Retention Rates & ROAS Insights

- Strategic Appeal:** A significant 44.6% of simulation players engage with puzzle games, indicating a shared preference for strategic and thoughtful gameplay.
- Diverse Interests:** An additional 29.9% engage with other game genres, pointing to a well-rounded gaming preference.
- Retention Fuels ROAS:** With D1 retention at 12.6%, simulation players stay engaged, leading to a 3x ROAS growth by D30. Their emotional investment translates into higher spending over time.

## Recommendations

- Capitalize early enthusiasm:** Leverage D1–D7 data signals to serve personalized ads, such as exclusive in-game bundles or limited-time offers.
- Segment-based targeting:** Identify micro-cohorts within the D7–D14 period showing signs of churn and deploy retargeting campaigns to reduce the retention drops.
- Dynamic Ad Variants for Dormant Users:** Use dynamic creatives to retarget dormant players.



Word Games

# Efforts to Engage Word Game Players with Social Play and Puzzle Crossover Spell Success

## Synthesized Cohort View



### App-solute Facts

Rewarded Ads boost player engagement by 25% and retention by 30%, offering non-intrusive options during gameplay pauses.



## Retention Rates & ROAS Insights

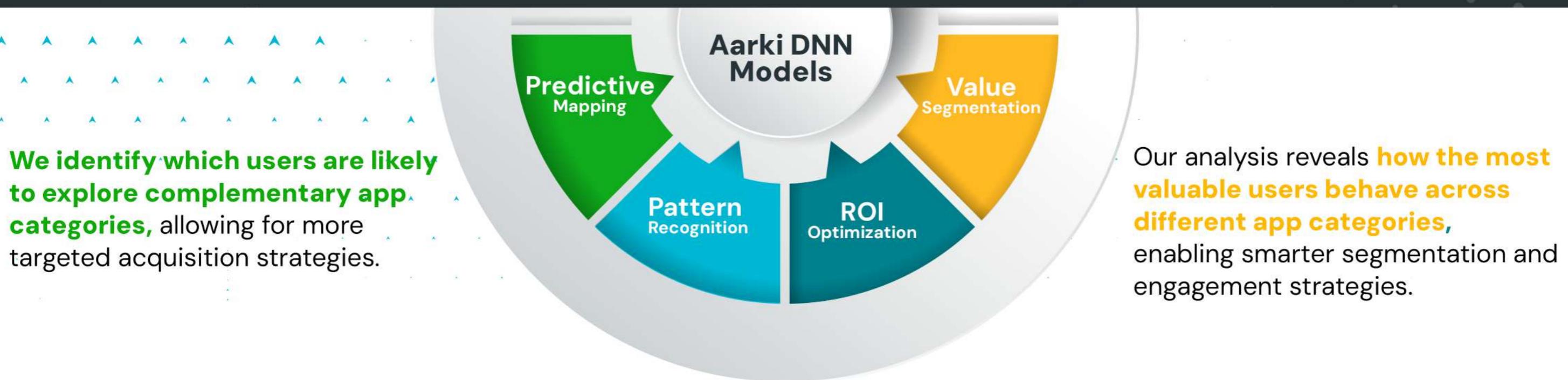
- Balanced Interests:** Gamers split their time between word games (31.8%) and puzzle games (32.9%), reflecting a strong preference for cognitive challenges and mental stimulation.
- High Engagement in Brief Sessions:** Gamers typically engage in shorter sessions, so offers should be quick, non-intrusive, and contextually relevant.
- Weak Retention, Low ROAS:** With D1 retention at just 2.5% and D30 dropping to 0.4%, word games struggle to retain users. Players engage casually, often without strong incentives to spend, leading to weak monetization.

## Recommendations

- Cross-Promote with Puzzle Games:** Pair puzzle game sessions (32.9%) with targeted ads promoting word games with unique themes or bonus rewards, leveraging the overlap in player preferences.
- Drive Early Conversions:** Focus ad creatives on early-game benefits, such as premium word packs, exclusive levels, or no-ads subscriptions, to improve Day 1 monetization.
- Monetize Through Incremental Engagement:** With low ROAS (D1 0.02 → D30 0.06), boosting player spending requires stronger incentives. Implement targeted in-game offers, unique special challenges, and limited-time bundles to increase engagement and conversions.

# Aarki's Deep Neural Networks Decodes Users' "App Hopping" Behavior

Aarki's Deep Neural Networks **analyze users' natural app usage patterns to create actionable insights**, serving as the foundation for our Supervised-AI-powered "Synthesized Cohorts" that accurately predict future behaviors based on intricate cross-app interactions.



We identify which users are likely to explore complementary app categories, allowing for more targeted acquisition strategies.

By tracking key actions, we uncover meaningful correlations between user behaviors in different apps, providing a holistic view of the user journey across the "App Hive".

Our analysis reveals how the most valuable users behave across different app categories, enabling smarter segmentation and engagement strategies.

Our comprehensive understanding of users' cross-app experiences allows for more efficient allocation of marketing budgets, maximizing overall return on investment.



## Deep Neural Networks and Supervised AI hold the blueprint of the App Hive

App marketers face a critical challenge: identifying and re-engaging users who truly drive sustainable growth. Our supervised AI technology doesn't just observe—it pairs up with human expertise to interpret, strategize, and transform user data into actionable intelligence.

For every app category, we map intricate networks of user interactions, identifying clusters of apps where valuable users naturally converge. Imagine a sophisticated intelligence system that doesn't just track user behavior, but understands the underlying patterns of digital engagement.

Our deep neural networks analyze millions of data points, creating Synthesized Cohorts reveal where your most valuable users actually spend their digital time. This isn't about broad-stroke marketing—it's about intelligent, nuanced re-engagement. We help advertisers move beyond generic targeting by providing a sophisticated understanding of the App Hive.

Take, for instance, a lifestyle app. Synthesized cohorts reveal that its users frequently interact with health and fitness apps, fintech platforms, and e-commerce, unlike other cohorts that are dominated by gaming apps. By understanding these connections, advertisers can visualize an ecosystem and craft strategies that feel less like interruption and more like meaningful reconnection.

For advertisers, this means moving from scattershot approaches to surgical precision. We transform user data into a strategic asset, enabling apps to build engaged audiences that consistently deliver exceptional return on investment.

**Chaitanya Upadhyay**, Chief Product Officer, Aarki.

# Key Principles for Retention

## Leverage Dynamic Product Ads Across Verticals

Use dynamic product ads powered by AI to serve hyper-relevant recommendations based on user preferences and behaviors, from food deals to shopping catalogs. This ensures users see products or services that resonate with their needs, driving higher engagement.

## Deploy Deep Linking for Seamless Experiences

Guide users directly to personalized landing pages or app sections—be it a seasonal menu, a product offer, or a financial tool—using deep linking. This reduces friction, streamlines the user journey, and improves conversion rates.

## Enhance Personalization With Behavioral Targeting.

Leverage shared data with DSPs to build advanced segmentation algorithms. This enables retargeting users with tailored creatives based on historical behavior, such as frequent orders, cart abandonments, or prior app activity. By providing precise data to DSPs, brands ensure ads feel relevant, timely, and impactful for each user.

## Leverage Post-Back Targeting to optimize campaigns

by using real-time post-install data shared with DSPs. This data enables precise targeting strategies by focusing on users who are most likely to engage, convert, or retain based on their post-install behaviors, ensuring high-performing, efficient ad campaigns.

## Automate Event-Based Retargeting

Set up programmatic campaigns triggered by specific in-app events, such as incomplete transactions or milestones reached. By addressing user intent in real-time, these campaigns increase the likelihood of re-engagement.

## Use Data-Driven Creative Optimization

Incorporate programmatic creative testing to adapt ad visuals and messaging dynamically. Highlight features like security for finance apps or enticing promotions for food apps, ensuring maximum relevance for diverse audiences.



## The Road to Retention Success Starts Now

Users today are constantly moving between apps, searching for something new to capture their attention. This “app hopping” behavior can feel like a challenge, but for savvy advertisers, it’s a massive opportunity.

This report highlights a simple truth: it’s not just about keeping users in one app—it’s about understanding where they go next.

Think about this: a food & drink advertiser reaching board game players during their most strategic moments or connecting with puzzle game fans as they relax between levels. By understanding these patterns and behaviors, you’re not just placing ads—you’re meeting users exactly where they want to be engaged.

The secret is in creating connections. By aligning your campaigns with user preferences and timing, you transform moments of engagement into long-term loyalty. Whether it’s through personalized creatives, precise targeting, or well-timed offers, you can tap into user intent and build lasting impressions.

The data shows us where the opportunities are—now it’s time to act. Together, we can ensure your brand isn’t just visible but becomes a meaningful part of the user’s journey, wherever it takes them.

Let’s turn these insights into action and build stronger connections in 2025 and beyond.

# Contributors

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# Report Methodology

We conducted an in-depth analysis of cross-app user behavior, Ad Stickiness and ROAS, listening ad-signals data from our DSP platform, spanning global markets from January to December 2024.

## 1. Data Collection:

- A substantial dataset of advertising IDs was selected, encompassing both gaming and non-gaming app segments, ensuring a representative sample across categories.

## 2. Behavioral Analysis with Deep Neural Networks:

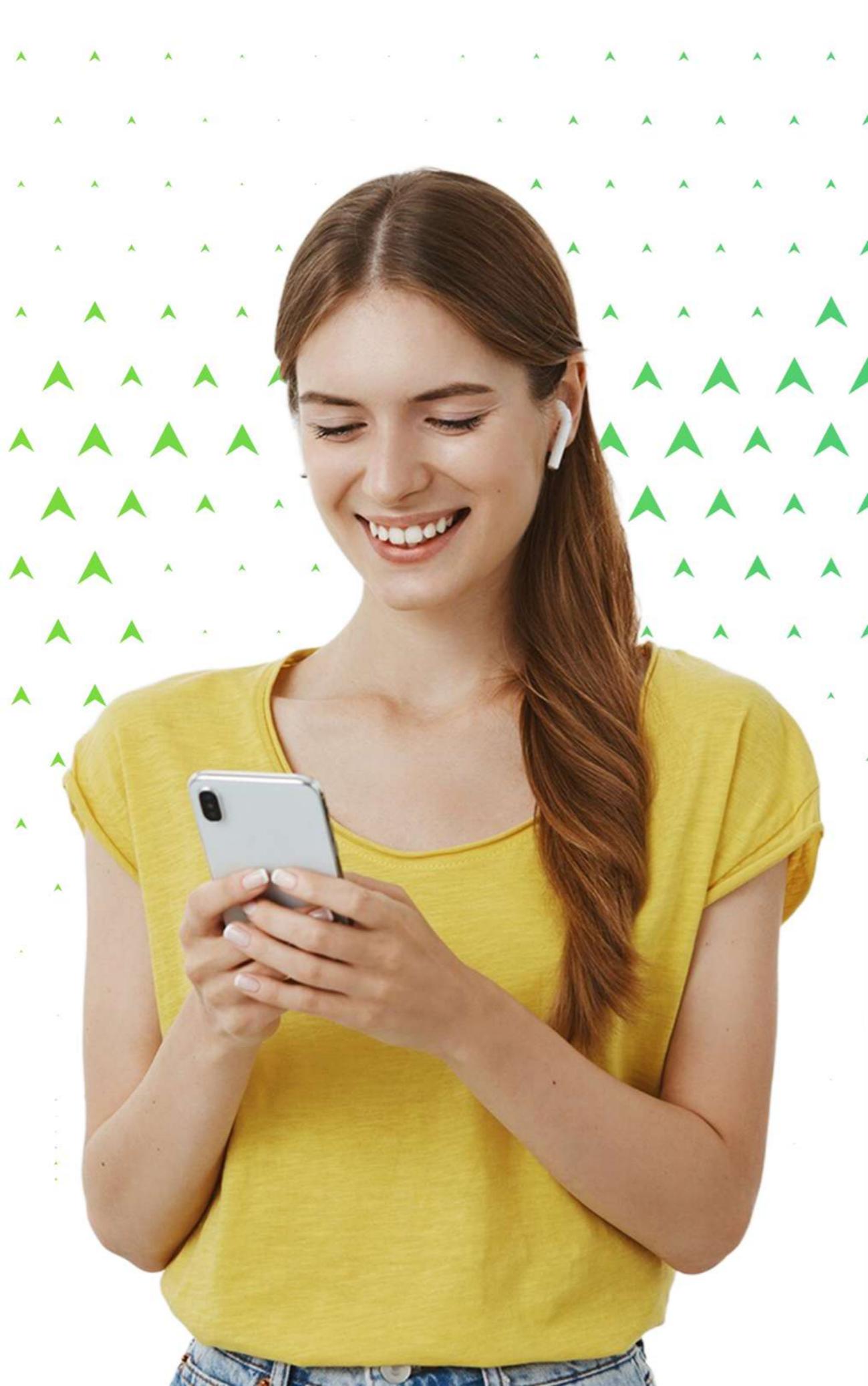
- Our analytics platform, powered by advanced Deep Neural Network models, was utilized to examine user behavior.
- The model interprets complex relationships between input data (e.g., app usage frequency, session duration) and predicted outputs, providing a multi-layered understanding of app consumption patterns.

## 3. Stickiness Index Calculation:

- The frequency of app category usage by individual users over a fixed period was analyzed to calculate the stickiness index.

This metric quantifies how "sticky" or engaging a particular app category is, offering valuable insights into user retention and category-level engagement trends

This methodology enables a comprehensive understanding of user behavior across app categories, empowering data-driven decisions to optimize campaign strategies and improve targeting on the DSP platform.





Aarki is an AI company that delivers advertising solutions that drive revenue growth for mobile app developers. Aarki allows brands to effectively engage audiences in a privacy-first world by using billions of contextual bidding signals coupled with proprietary machine learning and behavioral models. Working with hundreds of advertisers globally and managing over 5M mobile ad requests per second from over 10B devices, Aarki is privately held and headquartered in San Francisco, CA with offices across the US, EMEA, and APAC.

For more information, visit [www.aarki.com](http://www.aarki.com).