

Game Engagement Analysis Project

Overview

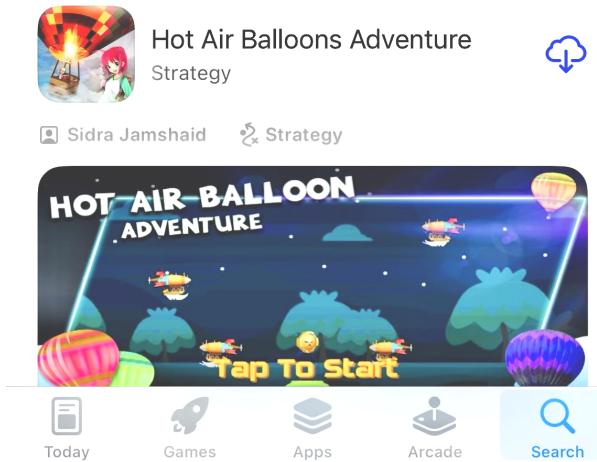
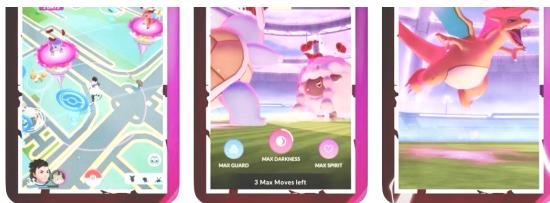
This project explores user engagement, retention, and growth for a mobile game using advanced data analysis techniques. The goal is to identify bottlenecks, opportunities, and actionable strategies to enhance performance and ensure sustainable growth.

App Overview

These screenshots provide context for user interactions and illustrate the journey from app discovery to engagement.

Impressions

This image shows the total number of users who saw the app.



Page Views

This image highlights users who clicked through to view the app page.

[Search](#)



Hot Air Balloons Adventure

Strategy

AGE	CATEGORY	DEVELOPER	LANG
4+ Years Old	 Strategy	 Sidra Jamshaid	E



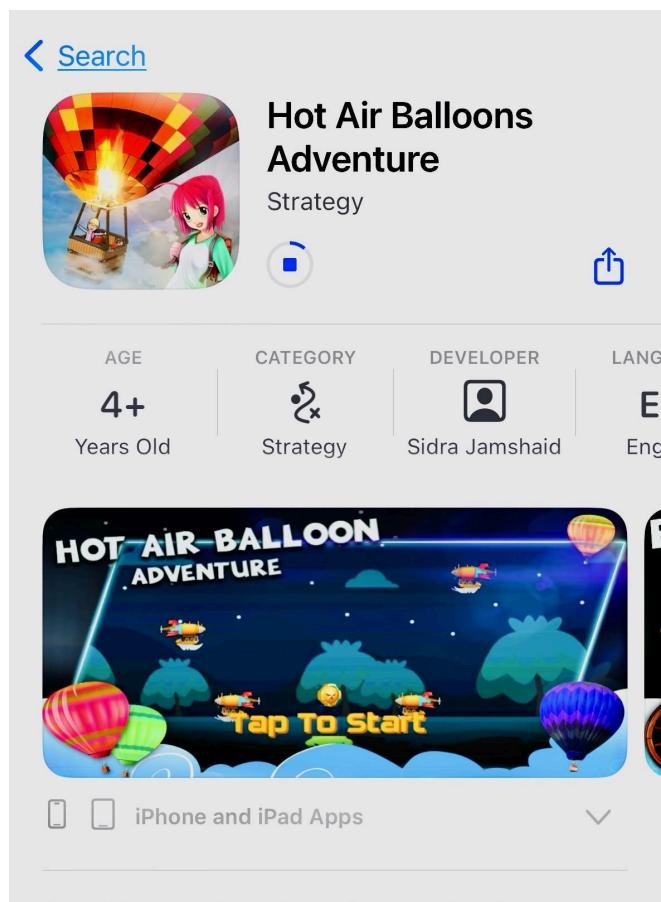
  iPhone and iPad Apps 

Get This Multiplayer Adventure To Help Sophia Land & Escape From Enemies
Sophia's amazing Hot Air Balloons adventure [more](#)

Sidra Jamshaid 
Developer

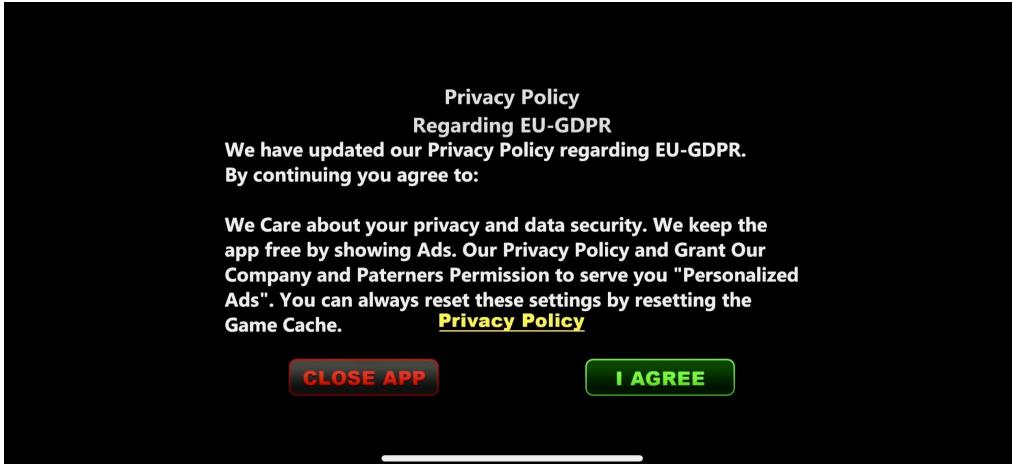
Downloading Game

This image demonstrates the process of users downloading the game.



Installing Game

This image showcases users installing the game after downloading it.



Gameplay Highlights

This image illustrates key gameplay moments, showing user engagement with the game.



Problem Statement

Mobile games often face challenges in retaining users, optimizing growth, and ensuring performance stability. This analysis aims to:

- Identify bottlenecks in the user funnel.
 - Understand regional and iOS version-specific performance.
 - Provide actionable recommendations for sustained growth and user retention.
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Business Impact

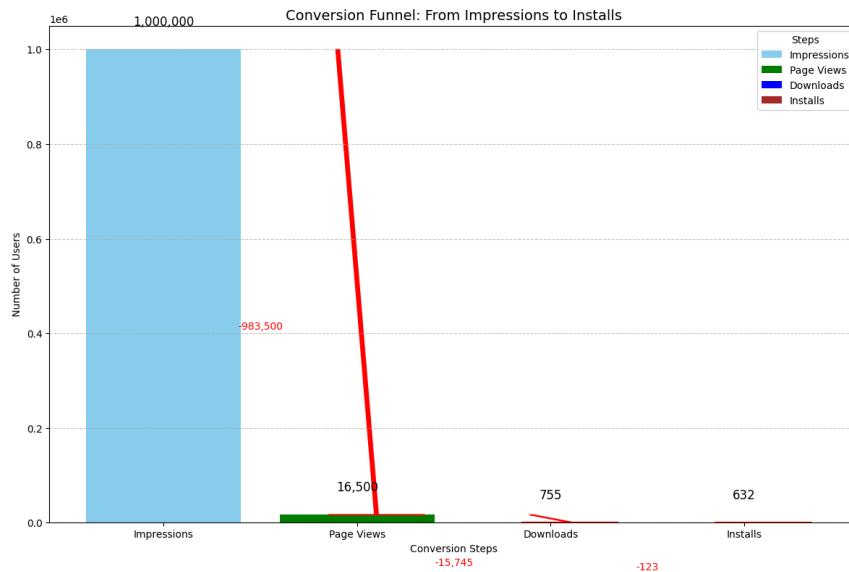
This project provides insights that can help:

- **Increase Revenue:** By improving funnel conversions and retention rates.
 - **Optimize Marketing:** By identifying high-performing regions and user segments.
 - **Enhance User Experience:** By addressing app crashes and improving engagement.
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Phases of the Project

Phase 1: Funnel Analysis

Goal: Understand the conversion funnel from impressions to installations.



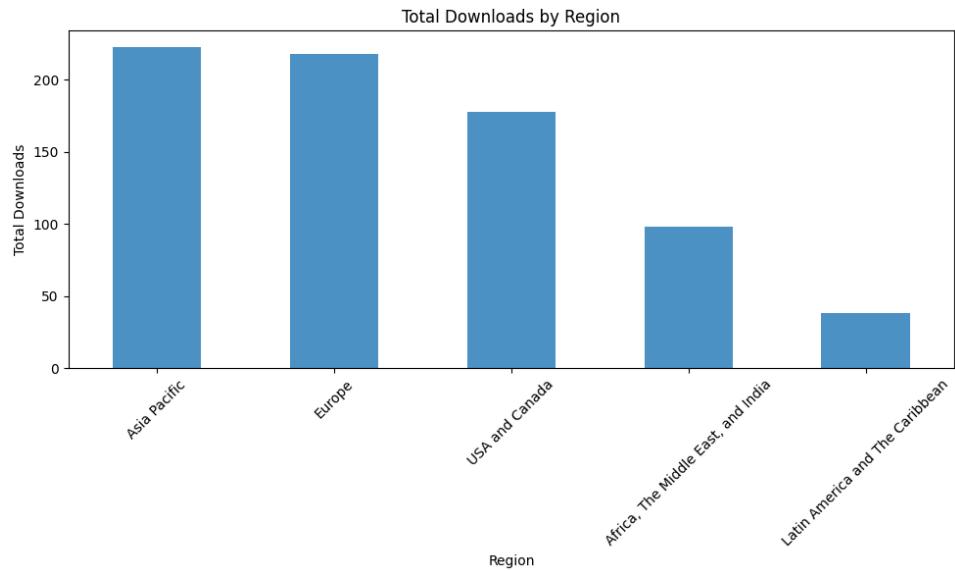
- **98% Drop-off:** Most users drop off between impressions and installs.
- **Retention Strength:** High retention rates among users who install the app.

Takeaway:

- Simplify onboarding and improve app store visuals to reduce drop-offs.
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Phase 2: Regional Performance

Goal: Identify regional strengths and opportunities.



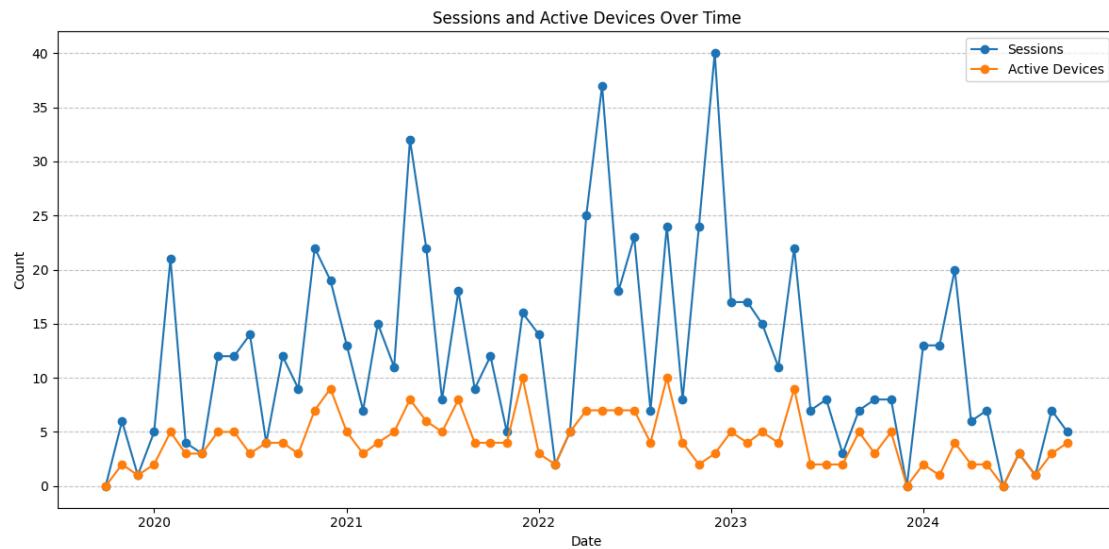
- **Top Regions:** Asia Pacific and Europe dominate downloads.
- **Opportunities:** Africa, the Middle East, and Latin America need targeted campaigns.

Takeaway:

- Localize marketing efforts for underperforming regions.
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Phase 3: Retention and Churn Analysis

Goal: Analyze retention trends and identify churn factors.



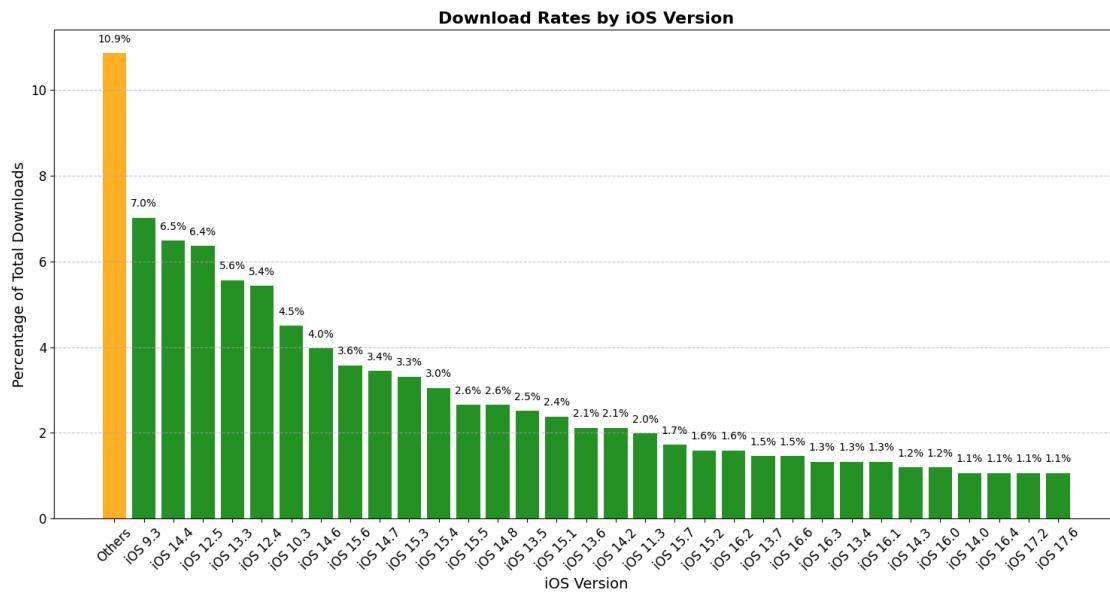
- **Retention Improvements:** Retention days increased from **30 in 2020 to 45 in 2023**.
- **Declining Churn:** Deletion rates dropped from **18% in 2020 to 10% in 2023**.

Takeaway:

- Introduce loyalty programs to retain users and reduce churn further.
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Phase 4: iOS Version Performance

Goal: Analyze downloads and crash rates by iOS version.



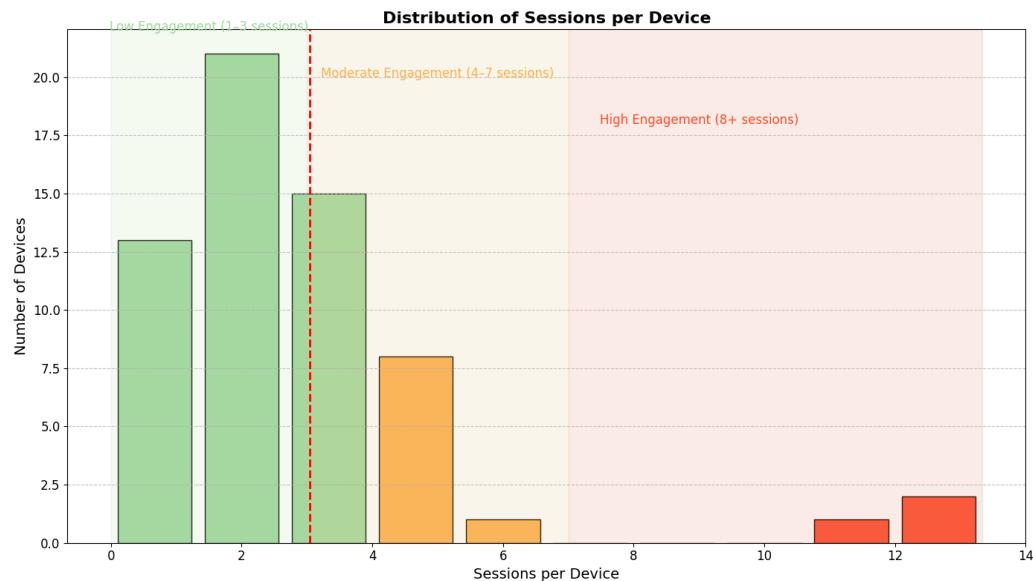
- **Key Versions:** A few iOS versions dominate downloads, while others contribute minimally (<1%).
- **Crash Rate:** Low overall crash rate (~3.25%), but specific iOS versions need debugging.

Takeaway:

- Prioritize debugging for high-crash versions to improve user satisfaction.

Phase 5: Engagement Analysis

Goal: Examine session patterns and active device trends.



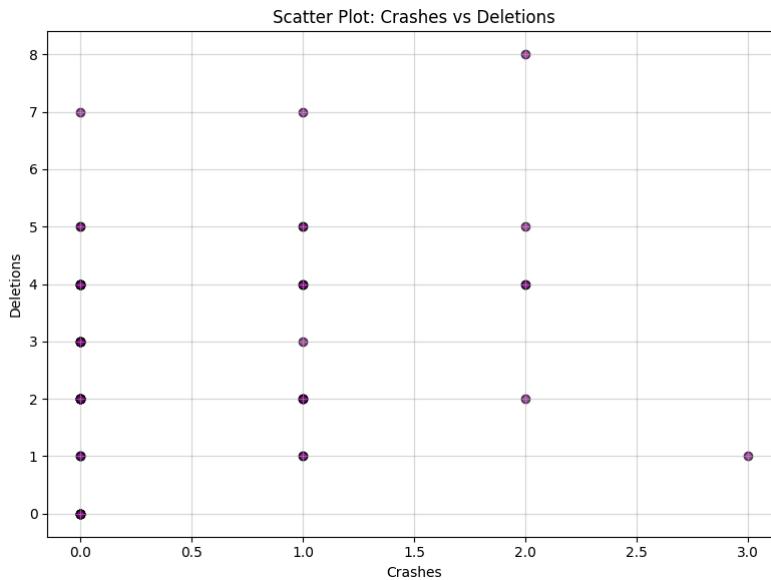
- **Engagement Peaks:** Align with updates or promotions.
- **Weekly Stability:** Weekly trends smooth out daily fluctuations.

Takeaway:

- Replicate strategies from high-engagement periods for sustained growth.

Phase 6: Crash and Deletion Trends

Goal: Assess the relationship between crashes and deletions.



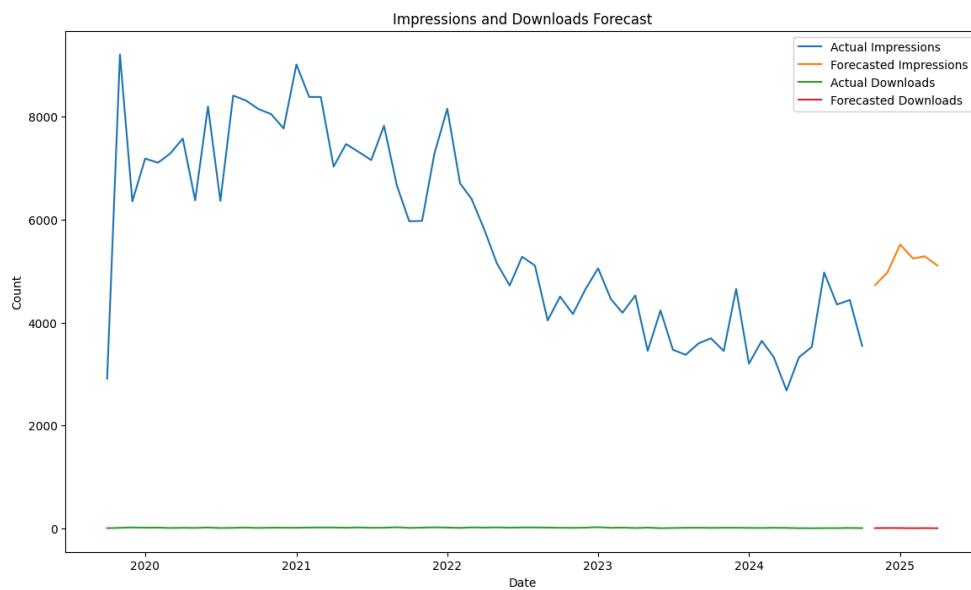
- **Moderate Correlation:** Crashes moderately influence deletions (~0.65 correlation).
- **Crash Rate Stability:** Crashes consistently account for ~3.25% of total events.

Takeaway:

- Focus on maintaining low crash rates to minimize deletions.

Phase 7: Forecasting Sessions and Impressions

Goal: Predict future growth and plan resource allocation.



- **Projected Growth:** Sessions are forecasted to grow steadily over the next 6 months.
- **Fluctuating Downloads:** Requires consistent user acquisition strategies.

Takeaway:

- Use forecasts to plan campaigns and allocate resources effectively.

Technical Skills Demonstrated

- **Data Cleaning & Transformation:** Pandas for merging, filtering, and cleaning datasets.
 - **Visualization:** Matplotlib and Seaborn for compelling plots.
 - **Retention Analysis:** Cohort heatmaps, churn metrics, and engagement trends.
 - **Forecasting:** Time-series modeling with Exponential Smoothing.
 - **Advanced Metrics:** Funnel analysis and correlation studies.
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Tools and Libraries Used

- **Python:** For data analysis and preprocessing.
 - **Pandas:** Data cleaning, manipulation, and merging datasets.
 - **Matplotlib and Seaborn:** Creating visualizations for insights.
 - **Statsmodels:** Time-series forecasting and trend analysis.
 - **Jupyter Notebooks:** Interactive data exploration and presentation.
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Recommendations

1. **Optimize Funnel Conversion:**
 - Simplify onboarding to reduce drop-offs.
 - Improve app store visuals and descriptions.
2. **Boost Retention:**
 - Implement loyalty programs for highly engaged users.
 - Use personalized campaigns for re-engagement.

3. Expand Regional Campaigns:

- Localize marketing for underperforming regions (e.g., Africa, Latin America).

4. Stabilize Performance:

- Debug high-crash iOS versions to improve user satisfaction.
- Conduct automated testing for app stability.

5. Leverage Forecasts:

- Plan resources and campaigns based on projected impressions and downloads.
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Future Work

1. Implement advanced machine learning models (e.g., ARIMA, LSTM) for more accurate forecasting.
 2. Expand the analysis to include monetization metrics like in-app purchases and ad revenue.
 3. Perform qualitative analysis by integrating user feedback to address specific pain points.
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Contact

Feel free to reach out for collaborations or inquiries:

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 - **LinkedIn:** [Sidra Jamshaid](#)
 - **Game Link:** [Hot Air Balloons Adventure](#)
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