Where the Growth Lives

App Performance Analysis to Drive the NEXT WAVE of E-Commerce Success

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Leveraging Proxy indicators for Performance

Operational Metrics Used

- o Currently Active Users (CA) by country/platform
- o Conversion rates (install-to-purchase)
- o New downloads & week-over-week change
- o Crash report rates
- o Country-level engagement splits (KSA, UAE, Egypt, Qatar)

Benefits of this approach

- o Enables early decision-making in low-data stages
- o Utilizes existing app store operational metrics
- o Highlights product-health factors impacting business
- o Encourages cross-functional thinking

Risk and Limitations

- o Proxies may not capture all nuances of real sales
- o Correlation does not equal causation
- o Misinterpretation can lead to misplaced investments

Experiment setting & data summary

Data Collection

o Weekly data from Nov-2023 to Aug-2025

o Google Play Console and Apple App Store dashboards

o Metrics:
  o CA (Current Active users)
  o Conversion Rates
  o New downloads
 o Crash reports

Dataset Overview

o 90 Weekly records

o 22 numeric features, 506 missing values

o 11 Android specific features, 11 iOS specific features

Platform Performance

o Android dominates for Country specific analysis as well as overall countries analysis compared to iOS

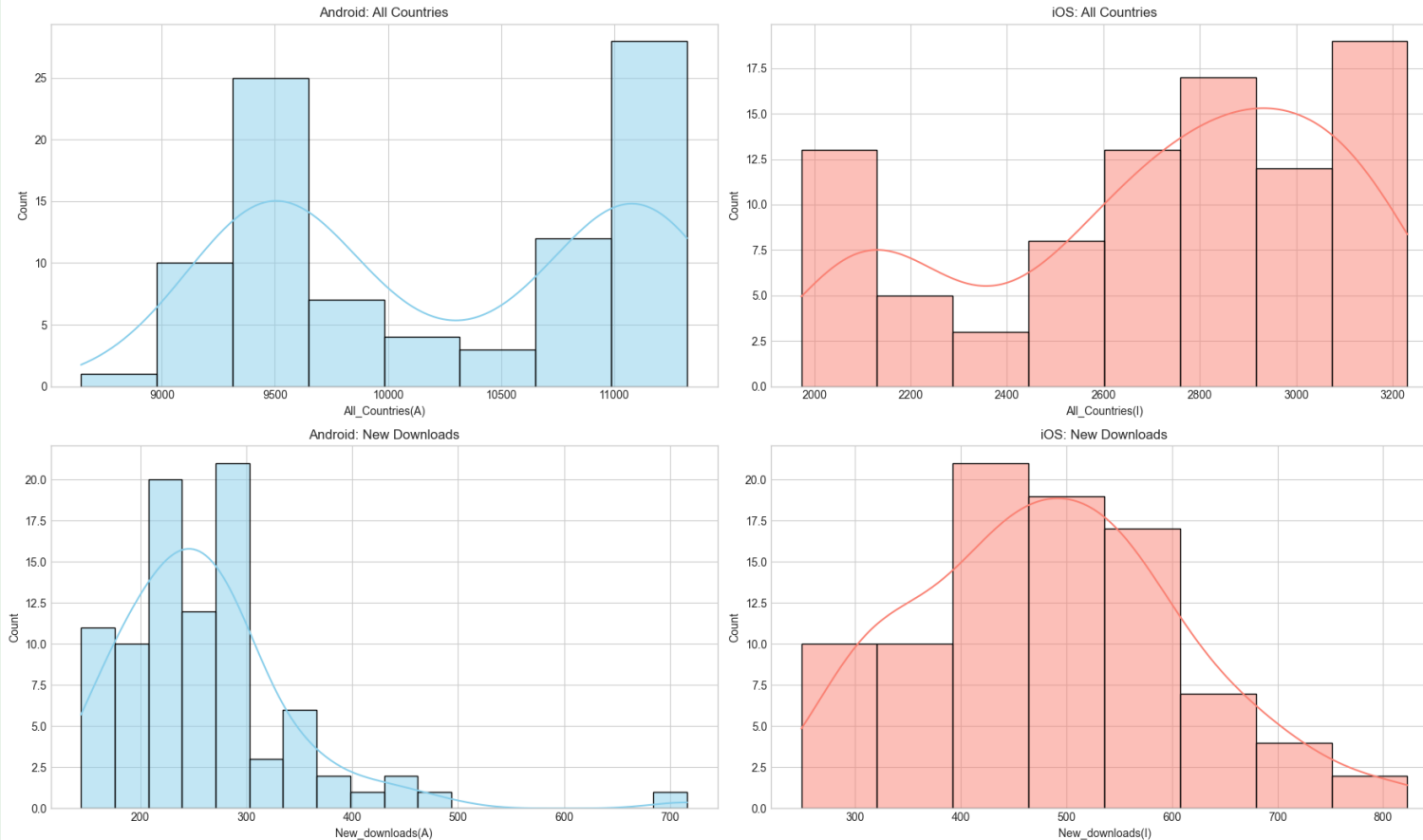o Mean active user through out:
  o Android: 1024
  o iOS: 2717

Country Performance

o KSA leads the app activity index, with mean average of user count as
  o Android: 4640.51
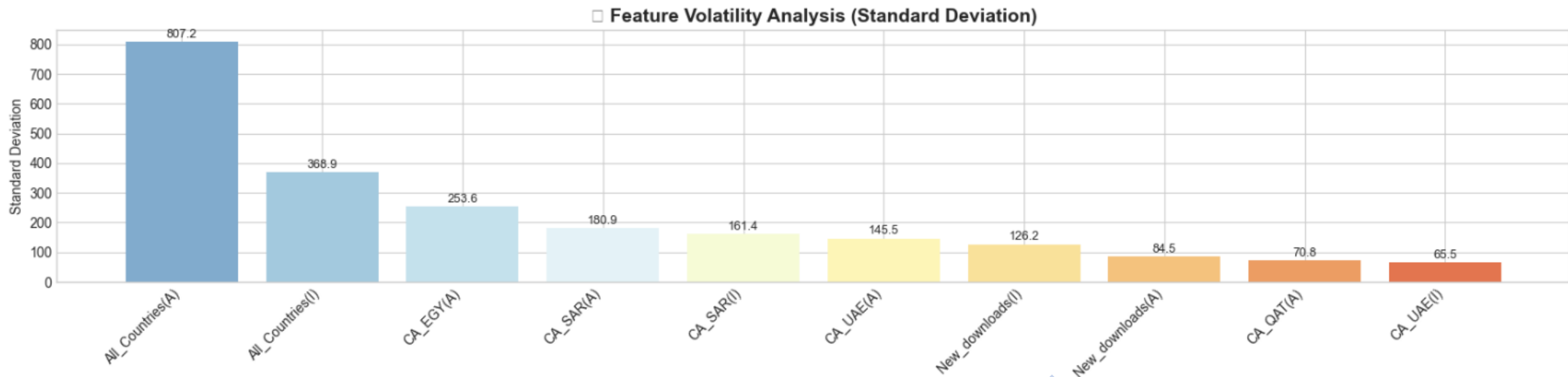 o iOS: 1410.47

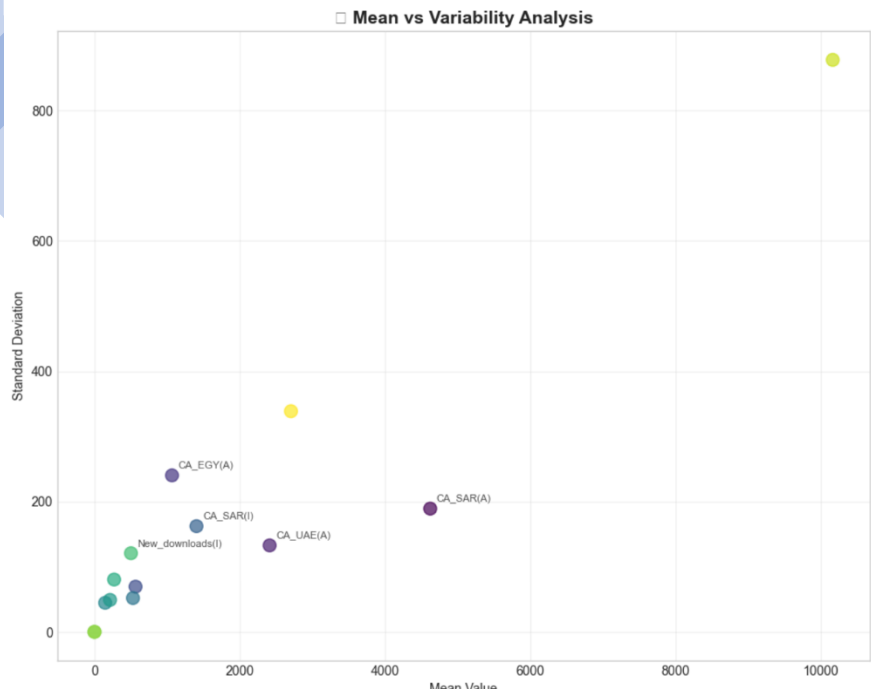o Followed by the UAE, Egypt and Qatar
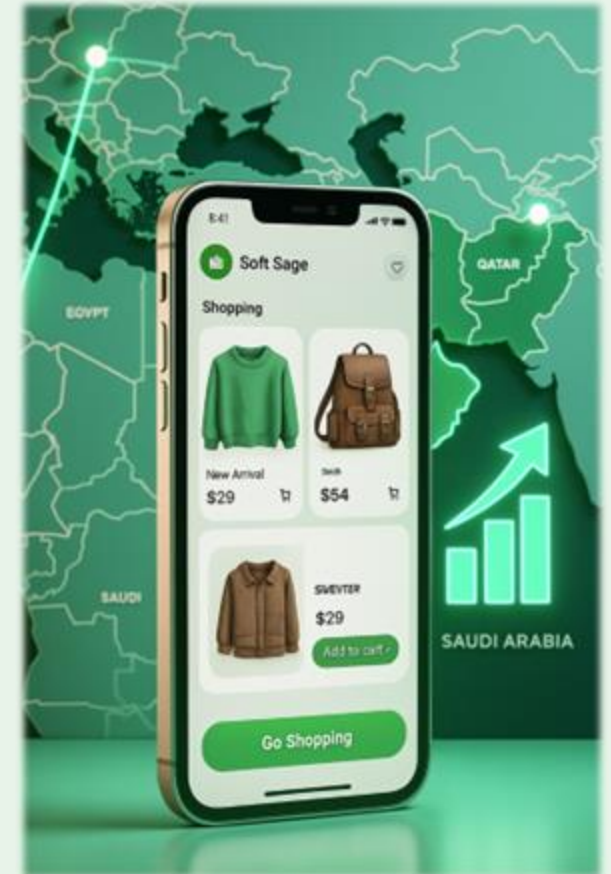
Key Performance Indicator: Distribution

- Android (All Countries): Higher totals but volatile, two clusters (~9500 & ~11000)

- iOS (All Countries): Lower totals but stable, consistent across markets

- Android (New Downloads): Right-skewed, low-to-mid downloads dominate; spikes from campaigns

- iOS (New Downloads): Bell-shaped, steady higher downloads (~400–500), less campaign dependence

Mean vs Variability Analysis

Feature Importance vs Volatility Analysis

Feature Volatility Analysis (Standard Deviation)

Key Performance Indicator: Box-Plot
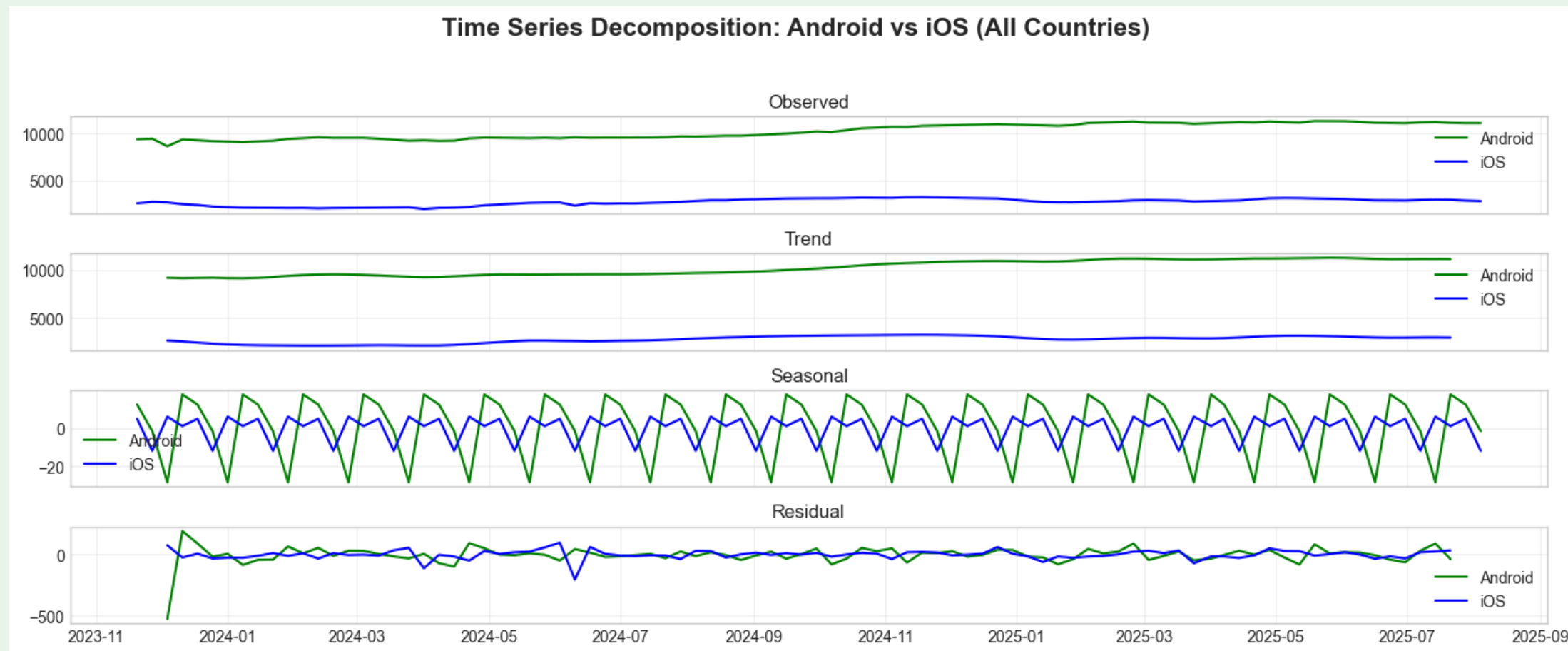
Country level Metric:

- Android values are consistently higher than iOS
- Countries like the UAE and Egypt shows wider spreads

Aggregated Metric:

- Android scale (~ 9k to 11k)
- iOS scale (~ 2k to 3k)
- iOS distribution is tighter

Box Plot of Numeric Features
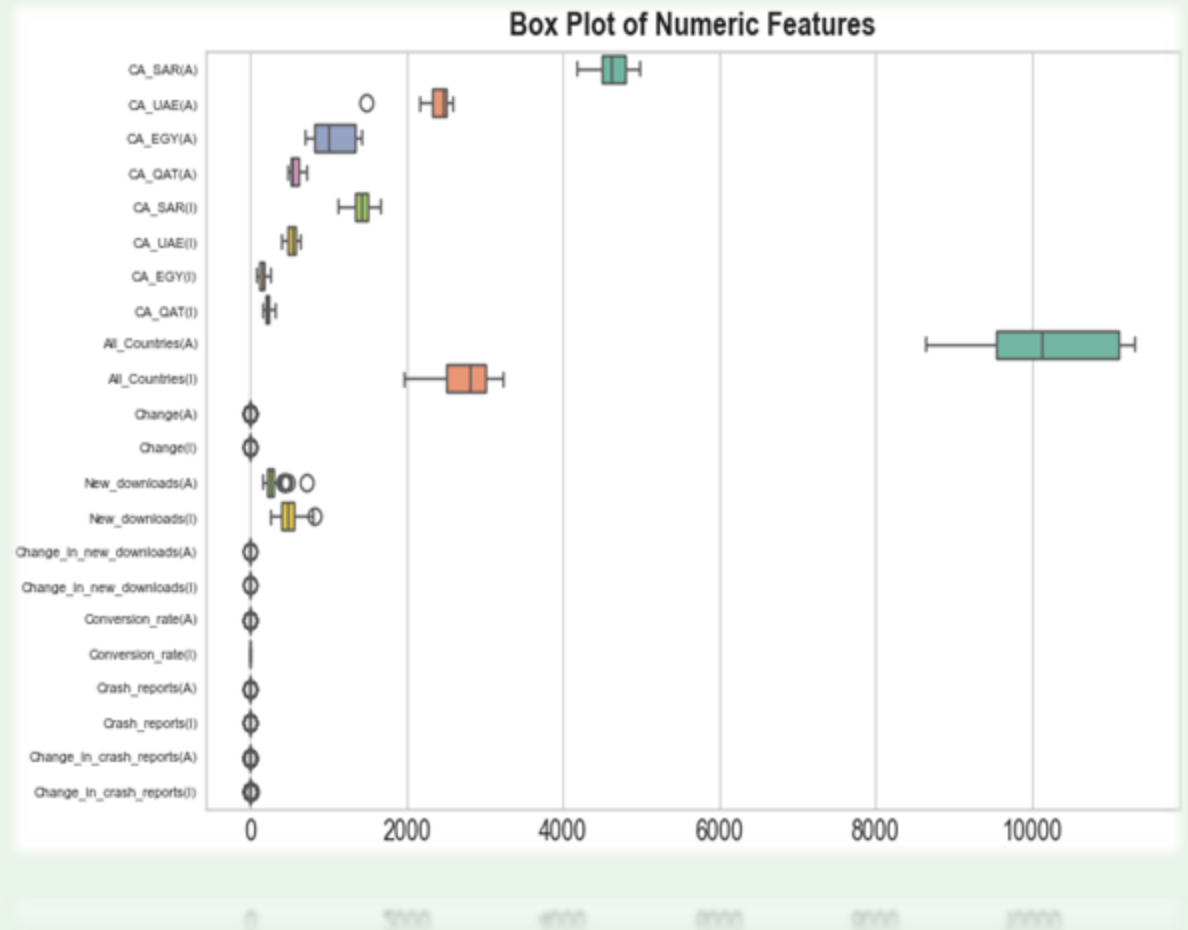
Time Series analysis for Active Users

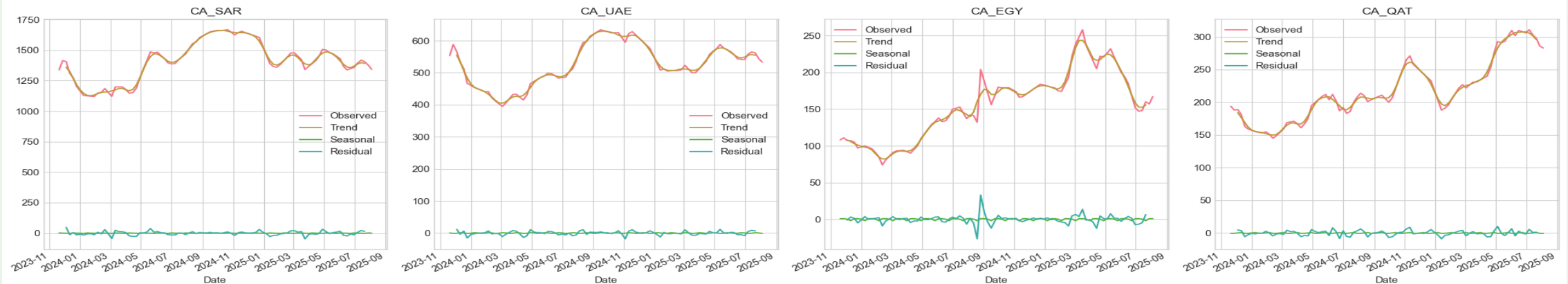Time Series Decomposition: Android vs iOS (All Countries)
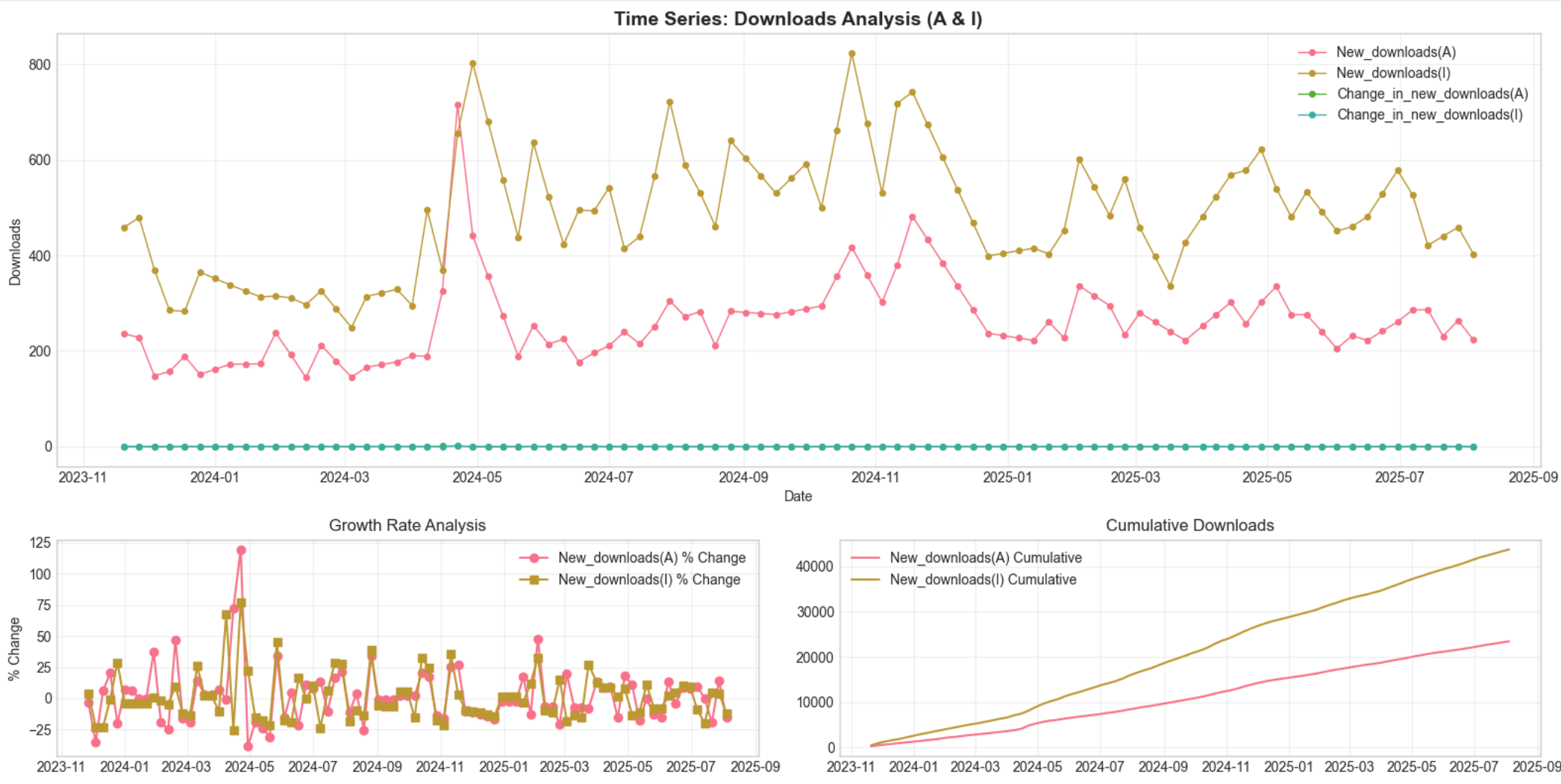
Country Specific analysis

Time Series Decomposition: Android (by Country)

Time Series Decomposition: iOS (by Country)

# Time Series analysis for New Downloads
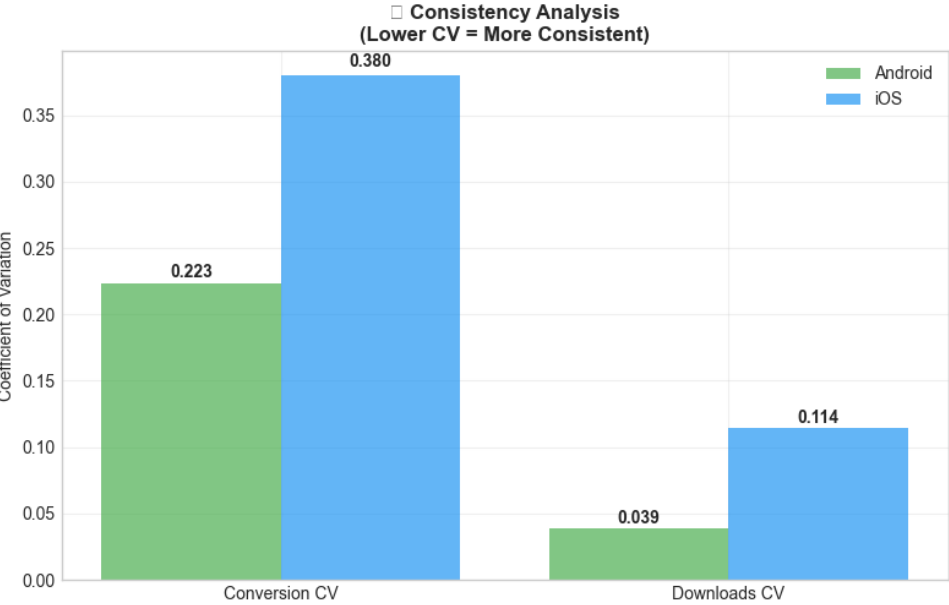
Hypothesis Testing: Key Findings

1. Android converts better than iOS, consistently

2. Higher crash rates depress conversion (especially on iOS)

3. KSA drives the lion's share; UAE is second; Egypt & Qatar smaller but steady

4. Acquisition spikes don't automatically yield conversion lifts (iOS risk)

5. Ramadan/Eid drives spikes in Active Users and Conversions

6. Summer months show lower engagement but higher conversion among retained users

7. Black Friday / end-of-year sales (Nov–Dec) produce spikes in new downloads and short-term conversion uplift

Android converts better than iOS, consistently

- **Android mean conversion rate: 0.5639**
- **iOS mean conversion rate: 0.3059**
- **Android advantage: 84.33%**
- **Statistical significance: YES**
- **P-value: 0.0000**

Hypothesis 1: Android vs iOS Performance Comparison
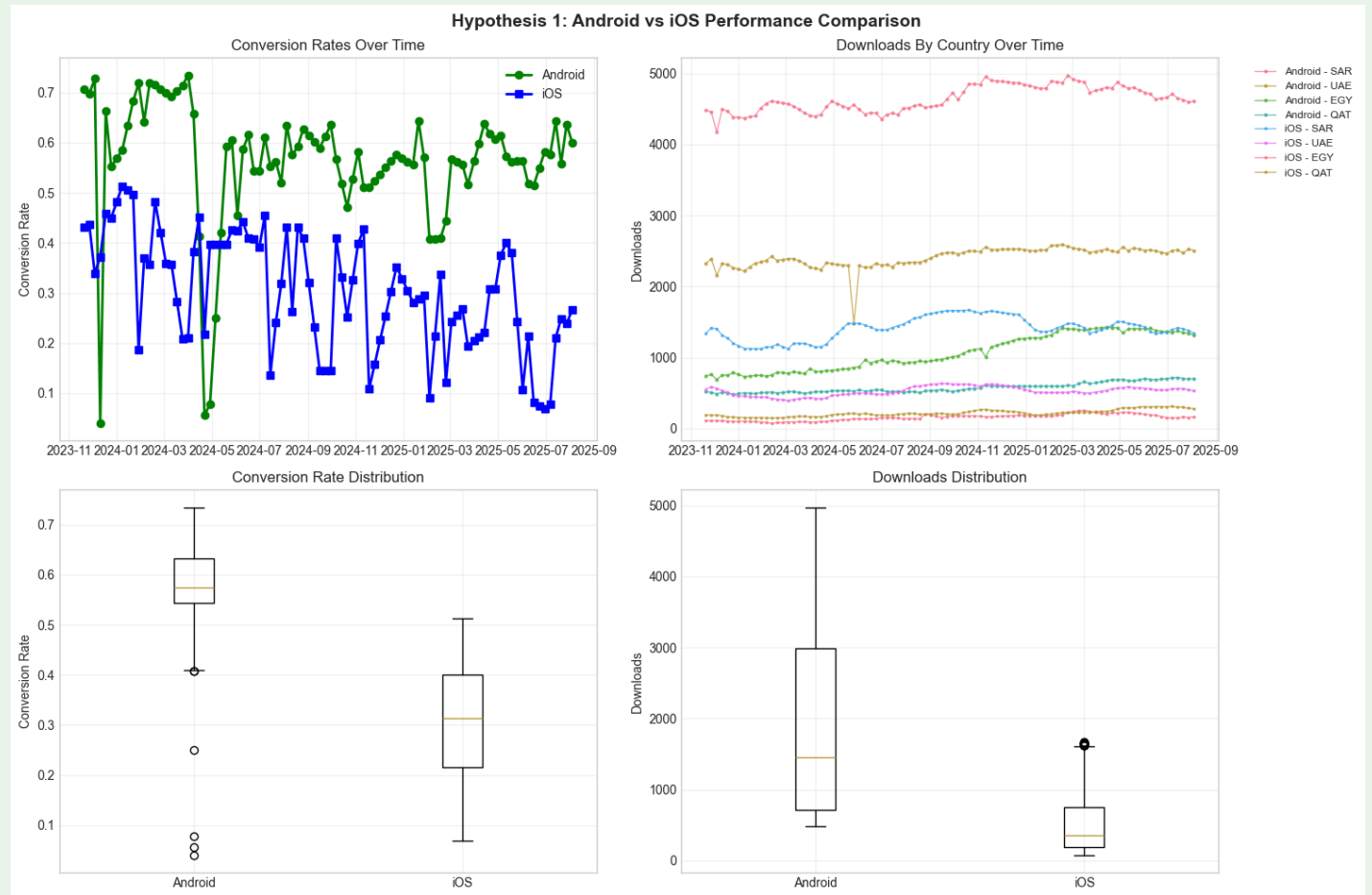
HYPOTHESIS 1 SUMMARY VISUALIZER
Android vs iOS Performance Analysis

Conversion Rate Comparison

Downloads Comparison

Consistency Analysis
(Lower CV = More Consistent)
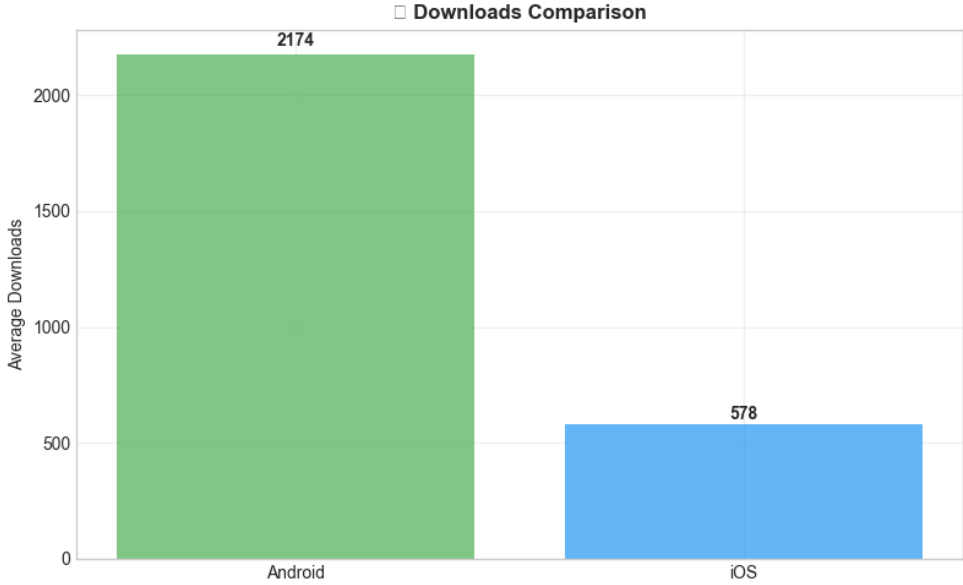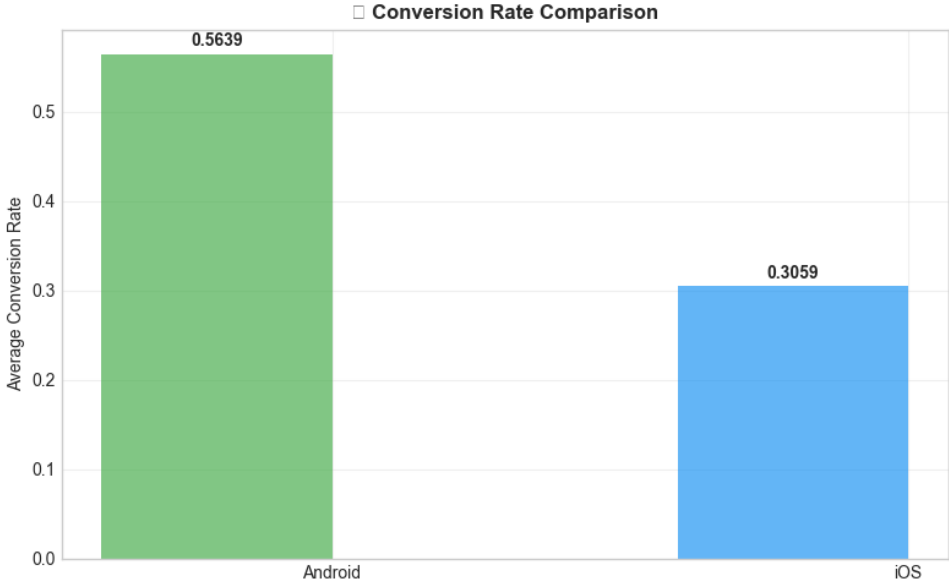
HYPOTHESIS 1 EXECUTIVE SUMMARY

	Metric	Result
	Conversion Winner	Android
	Downloads Winner	Android
	Conversion Advantage	+84.33%
	Downloads Advantage	+276.50%
	Statistically Significant	YES
	Strategic Recommendation	Focus on Android

PLATFORM PERFORMANCE INSIGHTS:
Android leads in conversion rates (+84.3% advantage)
Statistical significance: YES
More consistent platform: Android (lower CV)
RECOMMENDATION: Focus optimization efforts on Android platform

Higher crash rates depress conversion (especially on iOS)

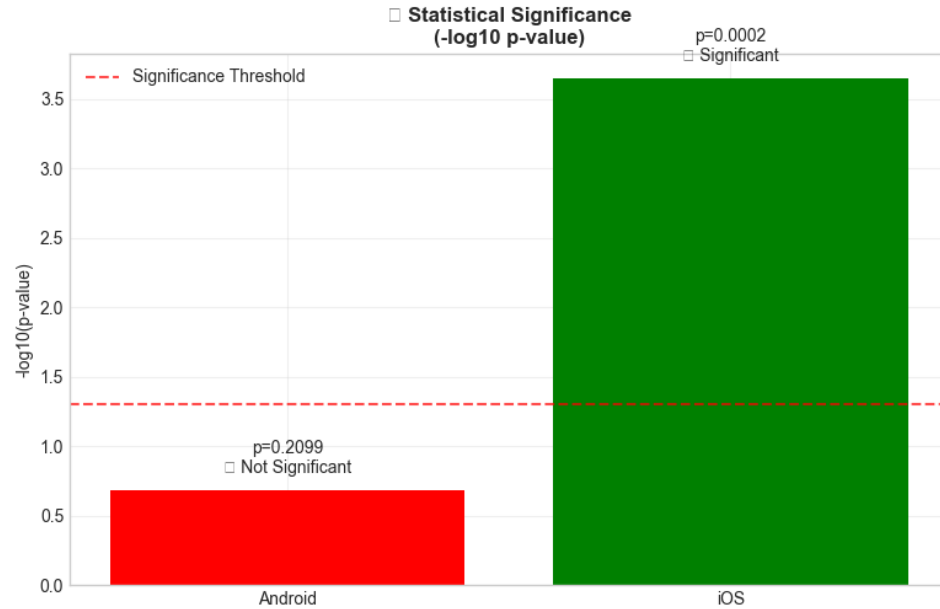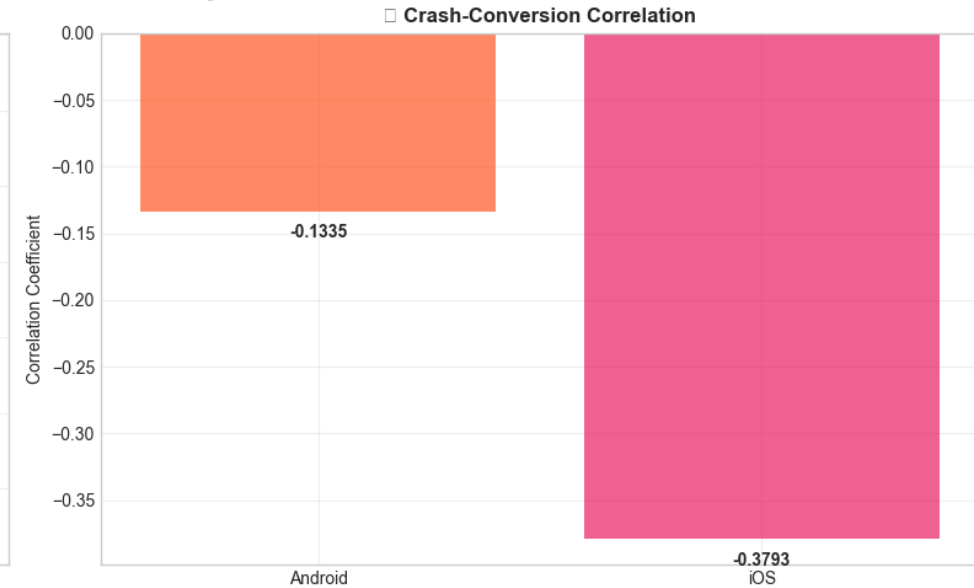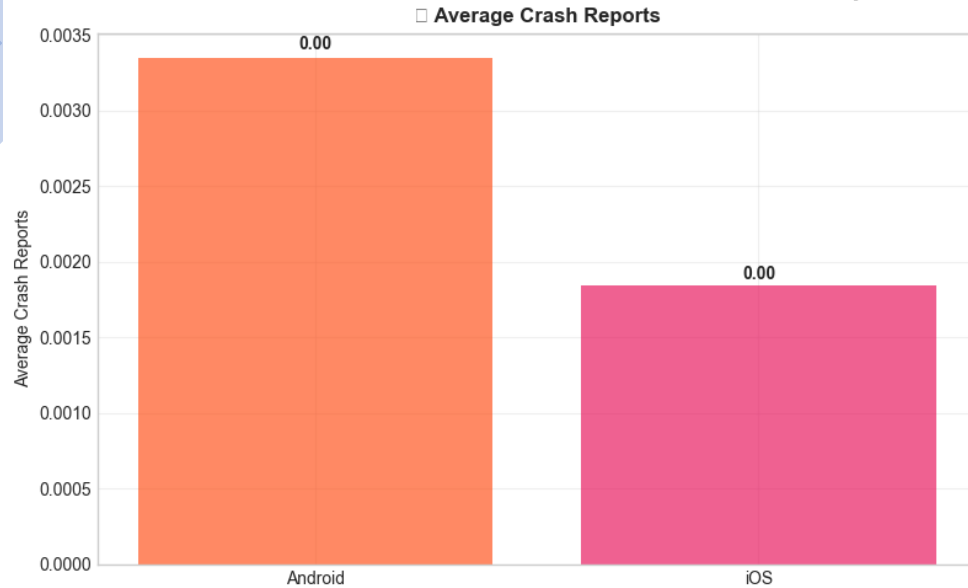- **Android crash-conversion correlation: -0.1335 (p=0.2099)**
- **iOS crash-conversion correlation: -0.3793 (p=0.0002)**
- **iOS is more affected by crashes: True**
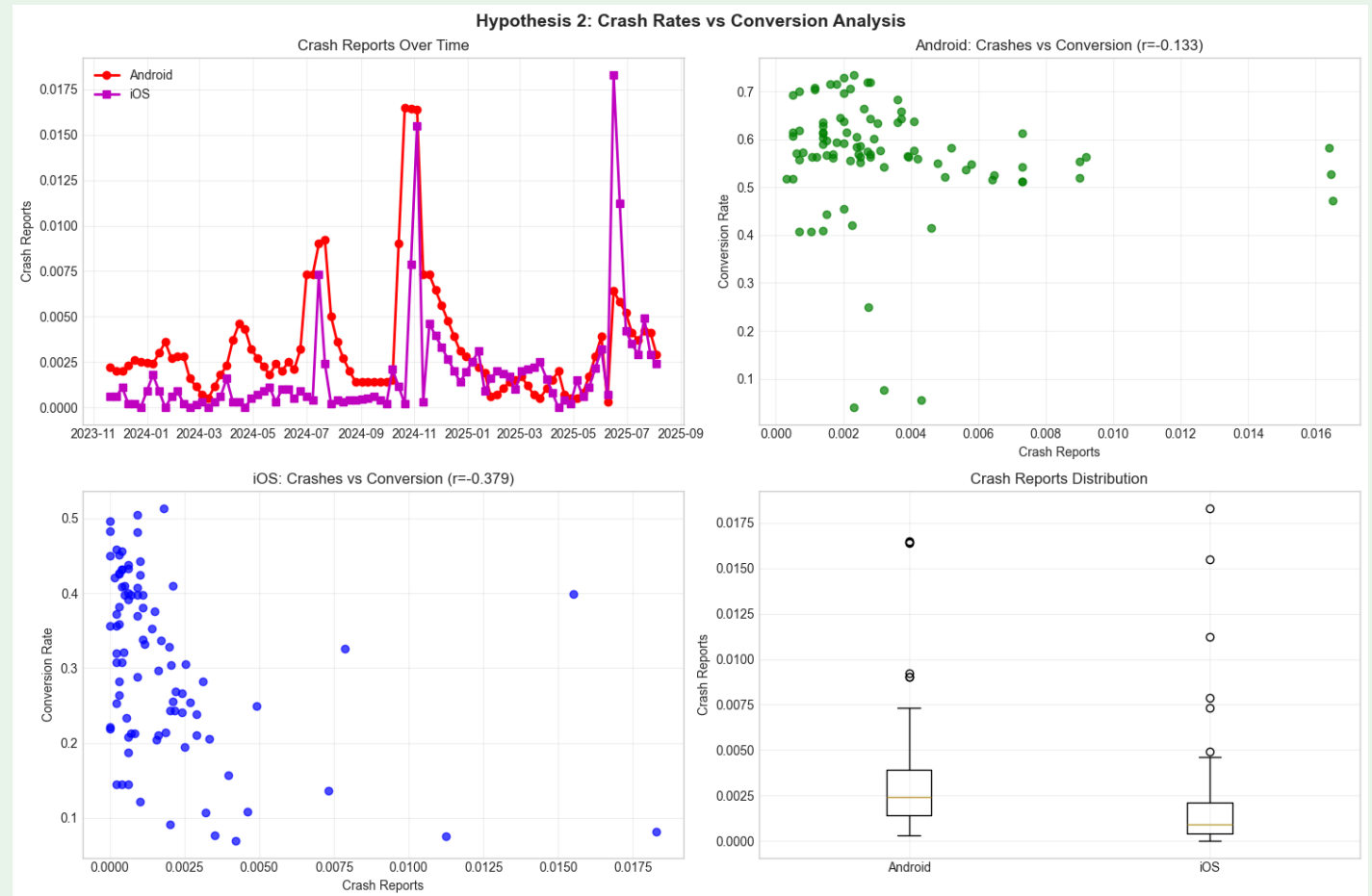
HYPOTHESIS 2 SUMMARY VISUALIZER
Crash Impact on Conversion Analysis

Average Crash Reports

Crash-Conversion Correlation

Statistical Significance (-log10 p-value)

CRASH IMPACT ASSESSMENT

	Impact Metric	Result
	Higher Crash Platform	Android
	More Crash-Sensitive	iOS
	Overall Impact Level	HIGH
	Correlation Strength	Android: -0.133, iOS: -0.379
	Priority Action	Focus on iOS crash reduction

CRASH ANALYSIS INSIGHTS:
• Platform with higher crashes: Android (0.0 vs 0.0)
• More crash-sensitive platform: iOS
• Impact severity: HIGH
RECOMMENDATION: Prioritize crash reduction in iOS to maximize conversion improvements

KSA drives the lion's share; UAE is second; Egypt & Qatar are smaller but steady

- **Ranking by performance:**
  KSA > UAE > Egypt > Qatar
  Ranking by steadiness:
- KSA > UAE > Qatar > Egypt
- **KSA drives lion's share: YES (p=0.0000)**
- **UAE second place: YES (p=0.0000)**
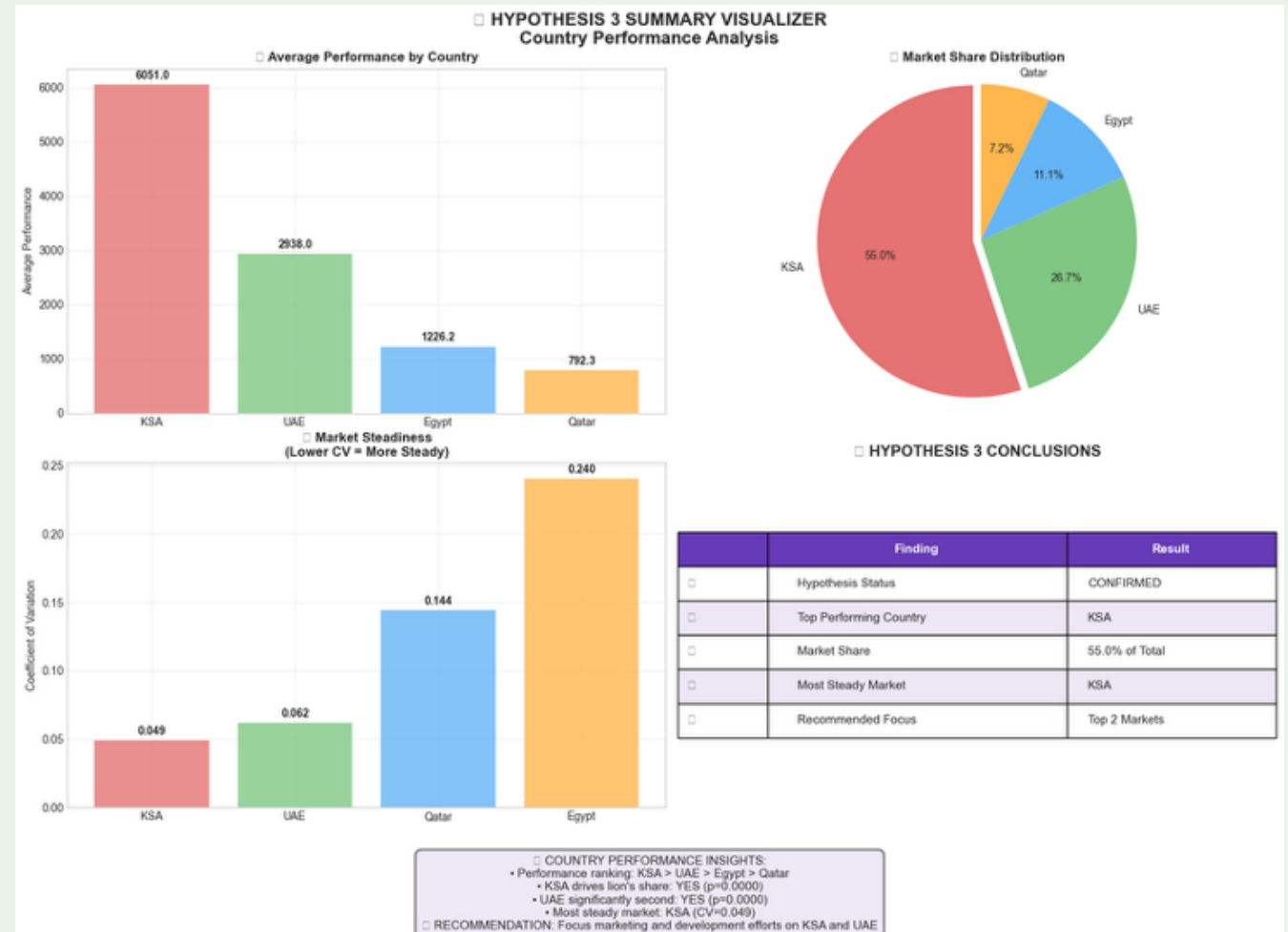
Acquisition spikes don't automatically yield conversion lifts (iOS risk)

- **Android download-conversion correlation: -0.5588 (p=0.0000)**
- **iOS download-conversion correlation: -0.2481 (p=0.0184)**
- **iOS correlation weaker (riskier): True**
- **Android spikes help conversion: NO (p=1.0000)**
- **iOS spikes help conversion: NO (p=0.3981)**
- **iOS acquisition risk confirmed: True**
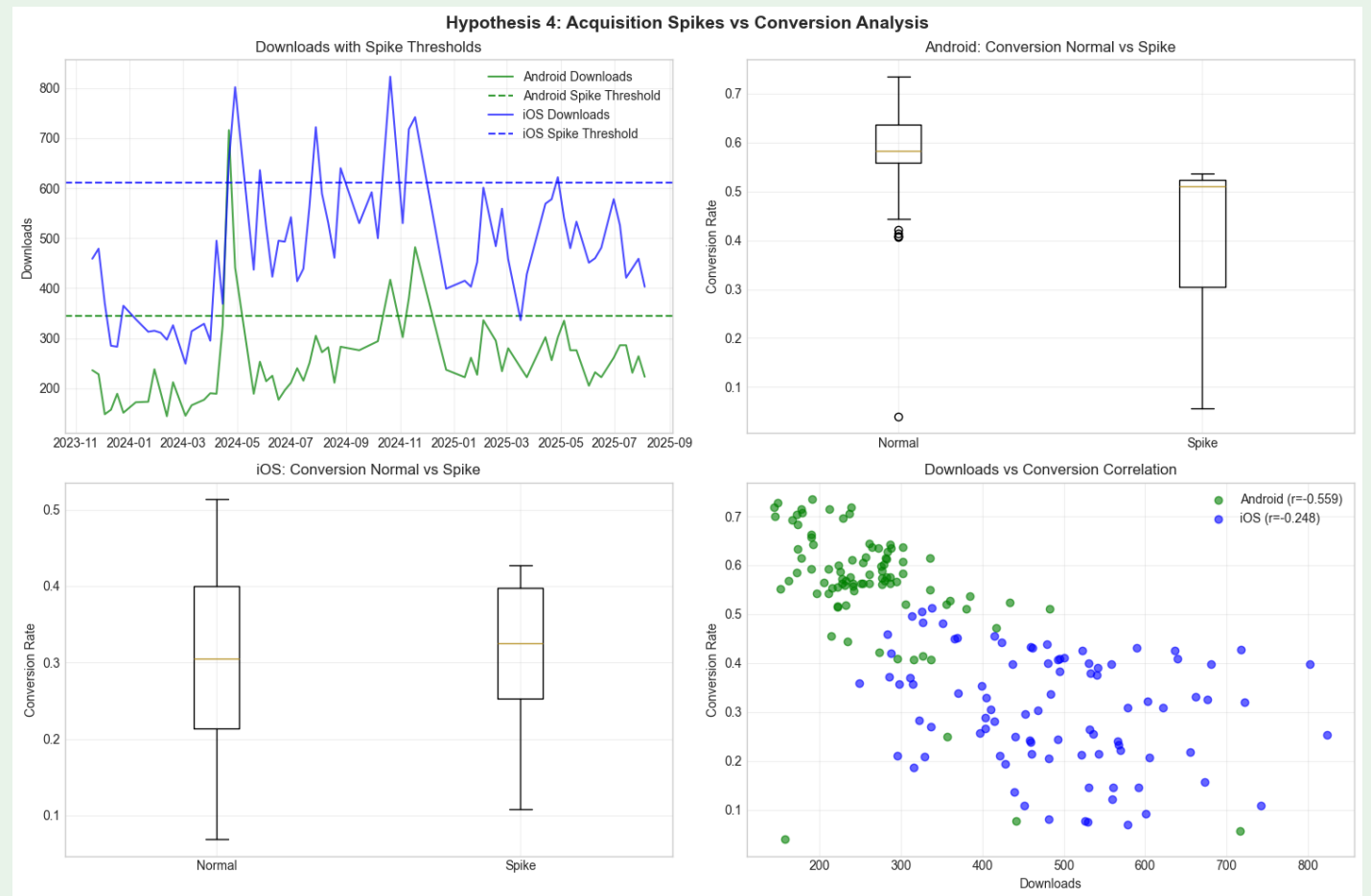
Hypothesis 4: Acquisition Spikes vs Conversion Analysis

HYPOTHESIS 4 SUMMARY VISUALIZER
Acquisition Spikes vs Conversion Analysis

Download-Conversion Correlation

Android: -0.5588
iOS: -0.2481

Statistical Significance (-log10 p-value)

Significance Threshold

Android Corr, iOS Corr, Android Spikes, iOS Spikes

Risk Assessment Profile

Spike Effectiveness, Correlation Strength, Overall Risk, Predictability

Android, iOS
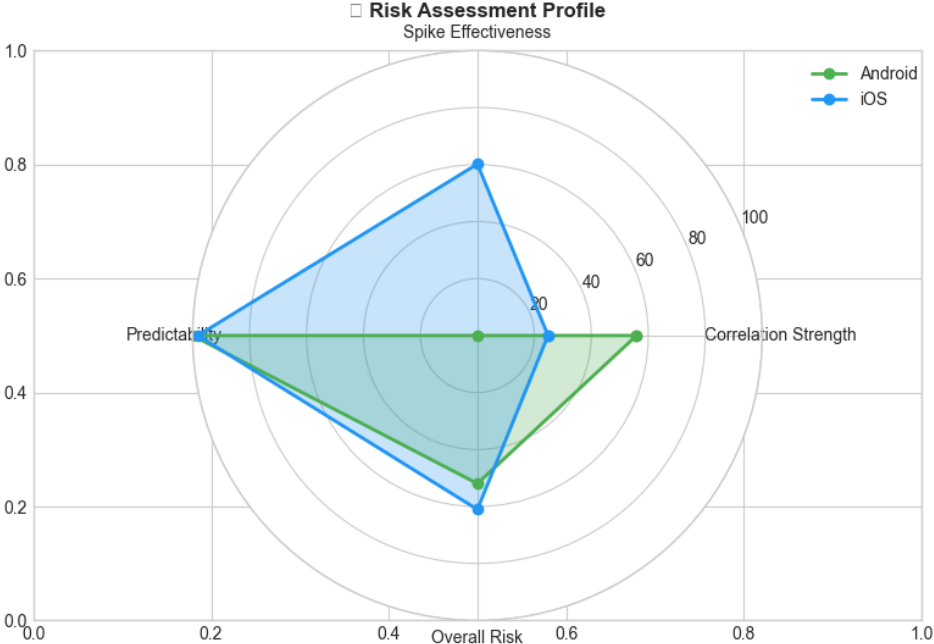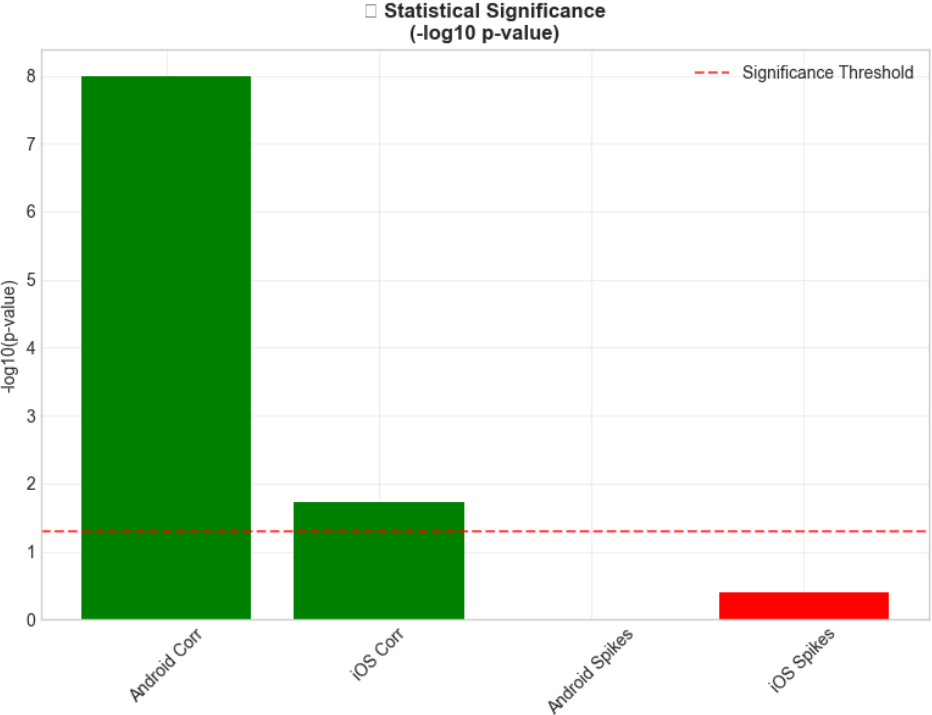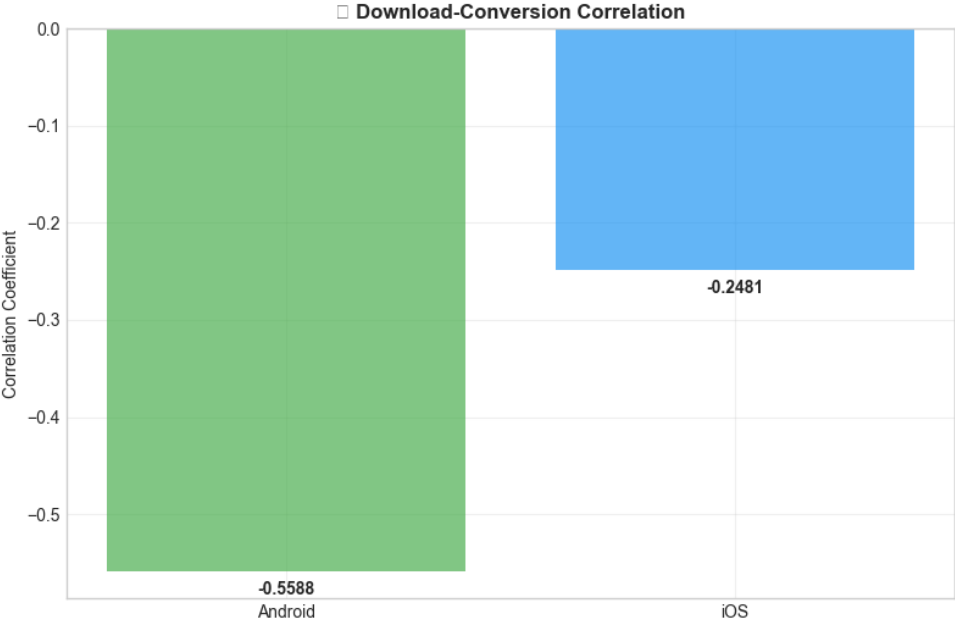
HYPOTHESIS 4 CONCLUSIONS

	Metric	Result
	Android Correlation	-0.5588
	iOS Correlation	-0.2481
	Platform Risk	iOS Higher Risk
	Spike Reliability	iOS Unreliable
	Recommendation	Focus on Android

Ramadan/Eid drives spikes in Active Users and Conversions

- **Ramadan/Eid CA activity: 10773 vs Normal: 11034**
- **CA activity p-value: 0.7385**
- **Ramadan/Eid conversions: 0.9% vs Normal: 0.87%**
- **Conversion p-value: 0.3532**
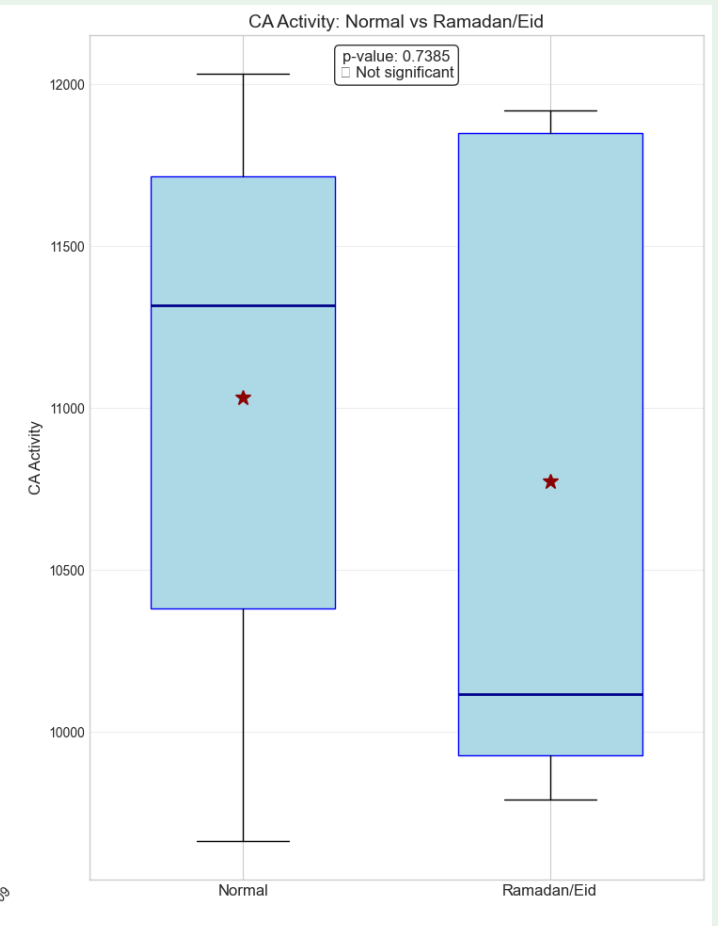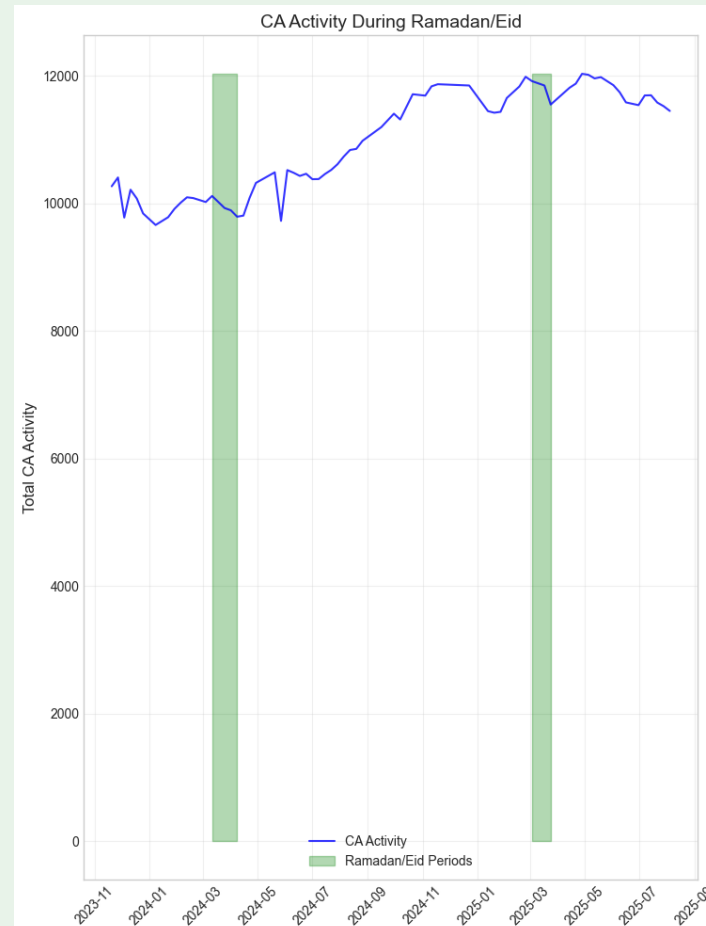
HYPOTHESIS 5 SUMMARY VISUALIZER
Ramadan/Eid Impact Analysis

CA Activity Impact

11034   Change: -2.4%   10773

- Normal Period
- Ramadan/Eid

(Y-axis: Average CA Activity — 0 to 10000+)

Conversion Rate Impact

0.87%   Change: +4.0%   0.90%

- Normal Period
- Ramadan/Eid

(Y-axis: Average Conversion Rate (%) — 0.0 to 0.8)

Statistical Significance
(-log10 p-value)

- - - Significance Threshold

p=0.3532
☐ Not Significant

p=0.7385
☐ Not Significant

- CA Activity
- Conversion Rate

(Y-axis: -log10(p-value))

HYPOTHESIS 5 EXECUTIVE SUMMARY

	Metric	Result
☐	Ramadan/Eid Status	NOT CONFIRMED
☐	CA Activity Change	-2.4%
☐	Conversion Change	+4.0%
☐	Statistical Power	0/2 tests significant
☐	Business Impact	☐ Moderate Impact

☐ RAMADAN/EID IMPACT: NOT CONFIRMED
☐ CA Activity: -2.4% change
☐ Conversions: +4.0% change

Summer months show lower engagement but higher conversion among retained users

- **Summer CA activity: 11040 vs Non-summer: 10996**
- **CA decline p-value: 0.5074**
- **Summer Android conversion: 0.572 vs Non-summer: 0.561**
- **Android conversion p-value: 0.7323**
- **Summer iOS conversion: 0.276 vs Non-summer: 0.316**
- **iOS conversion p-value: 0.8499**

Hypothesis 6: CA Activity During Summer
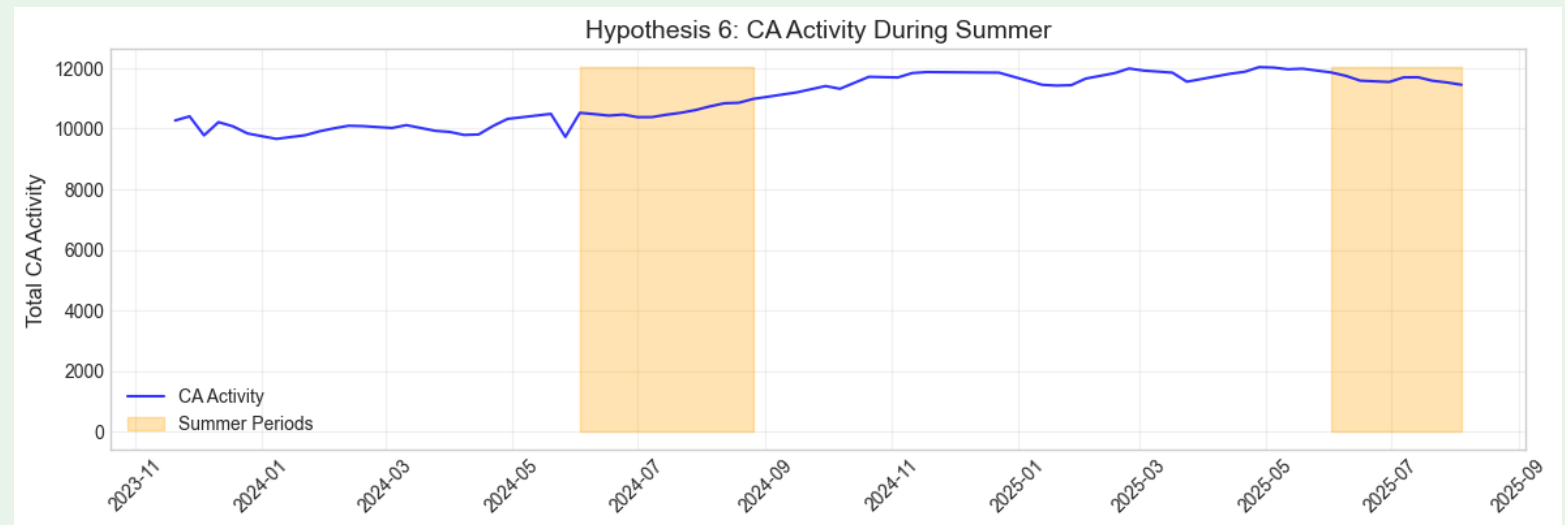
HYPOTHESIS 6 SUMMARY VISUALIZER
Summer Engagement vs Conversion Analysis

CA Activity: Summer Impact

Summer Change: +0.4%

- Non-Summer: 10996
- Summer: 11040

Conversion Rates by Platform & Season

- Android Non-Summer: 0.561
- Android Summer: 0.572
- iOS Non-Summer: 0.316
- iOS Summer: 0.276

Statistical Significance
(-log10 p-value)

- CA Activity Decline: p=0.5074 No Change
- Android Conv. Increase: p=0.7323 No Change
- iOS Conv. Increase: p=0.8499 No Change

--- Significance Threshold

HYPOTHESIS 6 SUMMER STRATEGY

	Summer Metric	Result
	Summer Status	NOT CONFIRMED
	CA Activity Change	+0.4% vs Non-Summer
	Android Conv. Change	+2.0%
	iOS Conv. Change	-12.7%
	Recommended Strategy	Maintain Engagement

KEY SUMMER INSIGHTS:
- Lower engagement but potentially higher conversion quality
- Platform-specific patterns may differ significantly
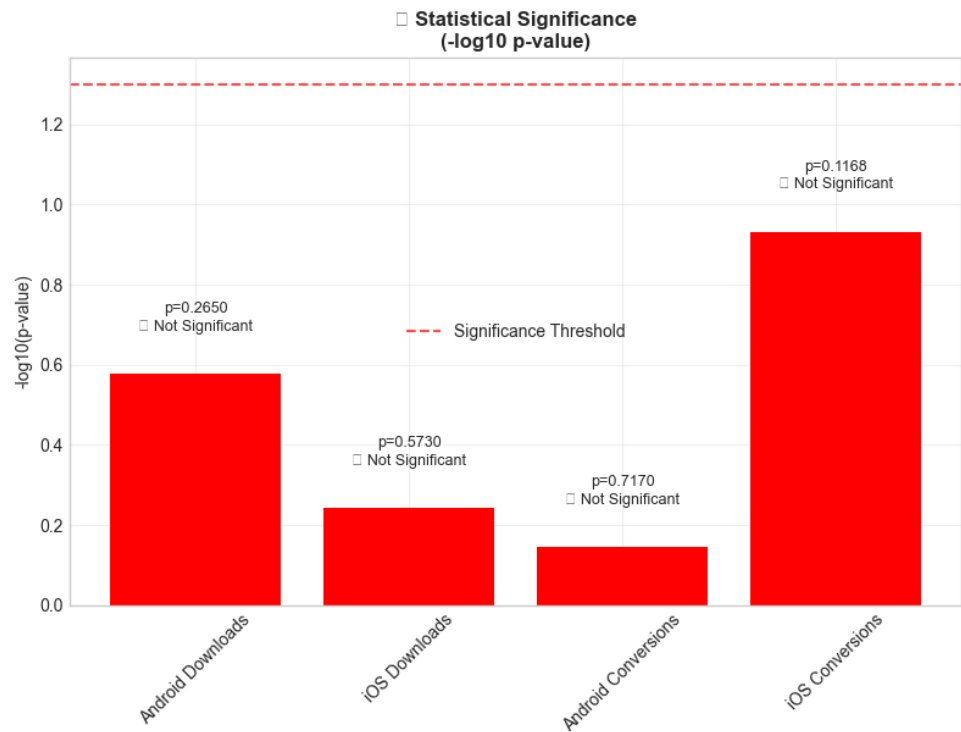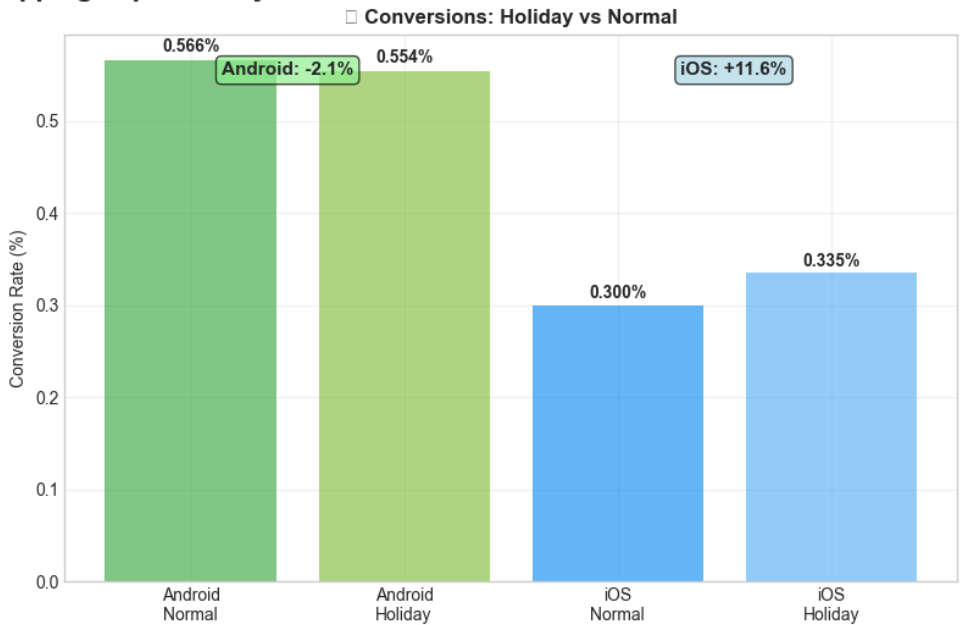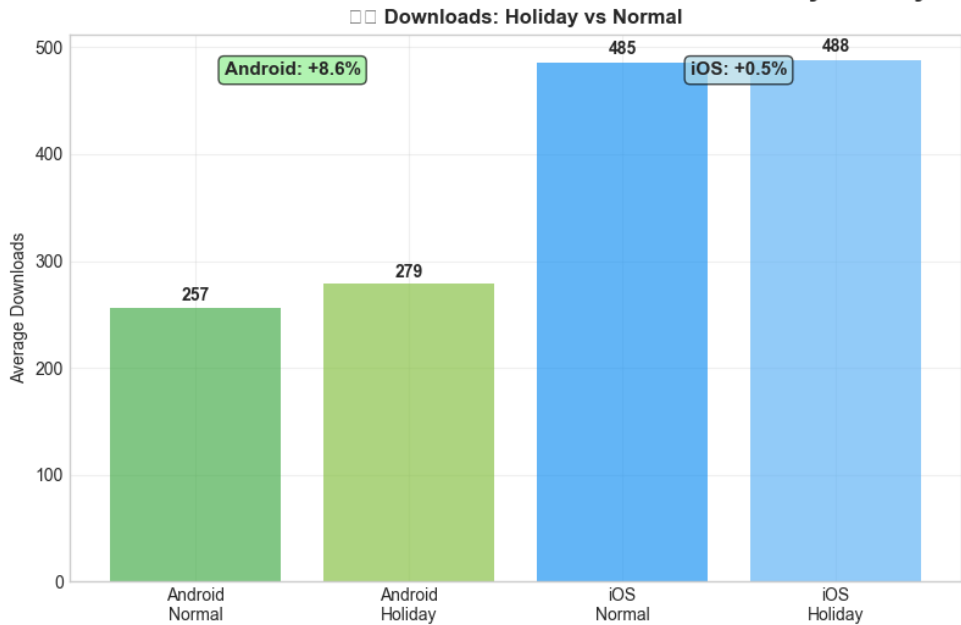- Seasonal optimization opportunities exist

Black Friday / end-of-year sales (Nov–Dec) produce spikes in new downloads and short-term conversion uplift

- **Holiday Android downloads: 279 vs Normal: 257**
- **Android download p-value: 0.2650**
- **Holiday iOS downloads: 488 vs Normal: 485**
- **iOS download p-value: 0.5730**

Hypothesis 7: Downloads During Holiday Shopping
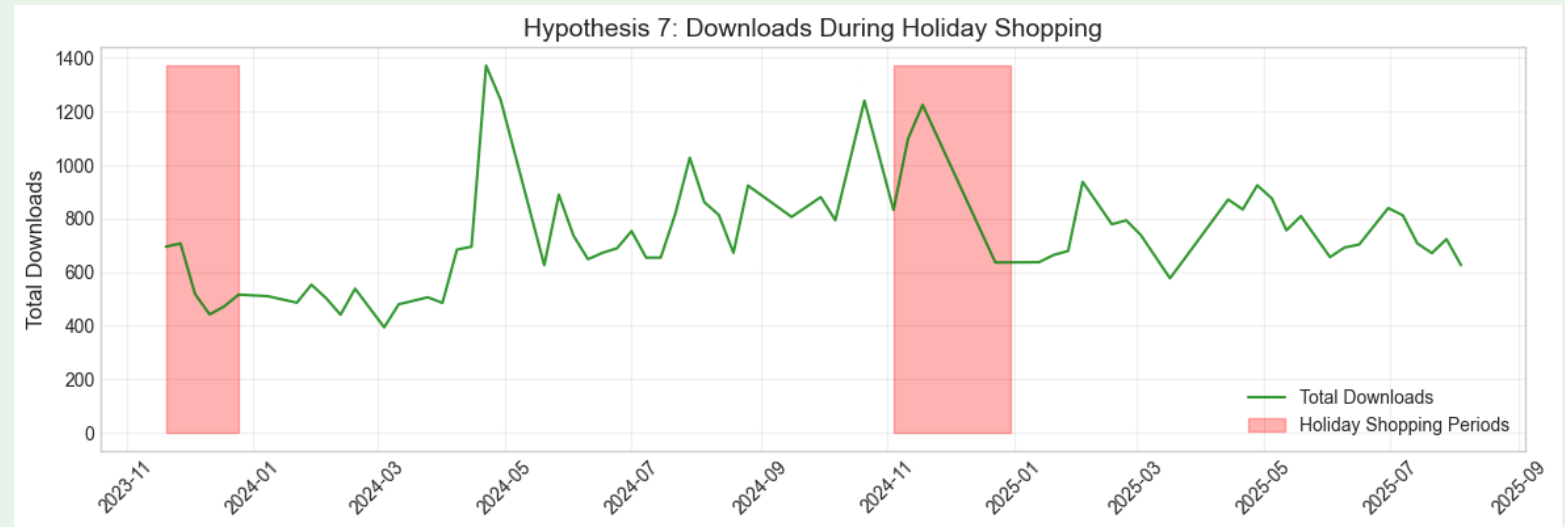
⬜ HYPOTHESIS 7 SUMMARY VISUALIZER
Black Friday/Holiday Shopping Impact Analysis

⬜ Downloads: Holiday vs Normal

Android: +8.6%

iOS: +0.5%

485 488

257 279

Average Downloads

- Android Normal
- Android Holiday
- iOS Normal
- iOS Holiday

⬜ Conversions: Holiday vs Normal

0.566% 0.554%

Android: -2.1%

iOS: +11.6%

0.300% 0.335%

Conversion Rate (%)

- Android Normal
- Android Holiday
- iOS Normal
- iOS Holiday

⬜ Statistical Significance
(-log10 p-value)

p=0.2650
⬜ Not Significant

p=0.5730
⬜ Not Significant

p=0.7170
⬜ Not Significant

p=0.1168
⬜ Not Significant

--- Significance Threshold

-log10(p-value)

- Android Downloads
- iOS Downloads
- Android Conversions
- iOS Conversions

⬜ HYPOTHESIS 7 HOLIDAY STRATEGY

	Holiday Metric	Result
⬜⬜	Holiday Impact Status	NOT CONFIRMED
⬜	Download Changes	Android: +8.6%, iOS: +0.5%
⬜	Conversion Changes	Android: -2.1%, iOS: +11.6%
⬜	Best Holiday Platform	Android
⬜	Recommended Strategy	Year-Round Focus

⬜⬜ HOLIDAY SEASON RECOMMENDATIONS:
- Status: NOT CONFIRMED
- Best opportunity: Android platform
- Focus on: Conversion optimization

Future Strategies & Recommendations

Platform Specific Growth

Market Prioritization

Campaign & Seasonality Planning

Stability & Risk Mitigation

Comprehensive Monitoring Framework

To ensure sustained growth and mitigate risks, we propose a multi-tiered monitoring framework, aligning with our strategic objectives and data-driven insights.

Automated Alert System

Proactive alerts categorize issues by urgency:

CRITICAL	WARNING	INFO
Immediate response required for severe issues like high crash rates or significant conversion drops.	24-hour response for issues like increased acquisition costs or app store rating drops.	Weekly review for gradual trend changes or minor fluctuations in metrics.

Executive Dashboard

Weekly Review

High-level metrics for leadership decision-making.

- **Revenue Impact:** Conversion gap, geographic distribution, and cost per acquisition. Key targets: iOS/Android conversion gap <10%, KSA revenue share <65%.
- **Risk Indicators:** Market concentration and platform dependency. Targets: Moderate market concentration (<0.5 HHI), balanced platform revenue (50/50 ± 15%).

Operational Dashboard

Daily Monitoring

Actionable insights for immediate operational adjustments.

- **Technical Performance:** App stability (crash rate <2%, uptime >99.5%), and platform performance gap (<5% conversion gap).
- **User Experience:** Conversion funnel health (>80% step completion) and user engagement (session duration >5min, return rate >40%).

Strategic Analytics
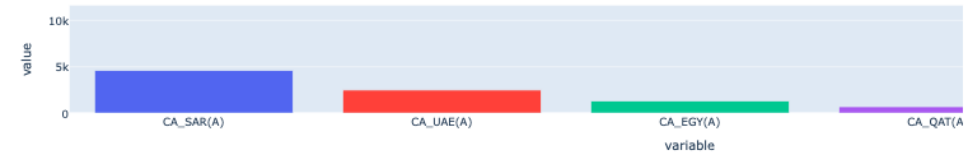
Monthly Deep Dive

Long-term strategic insights for market positioning and innovation.

- **Market Intelligence:** Competitive analysis and customer lifetime value (CLV). Target: 20% YoY CLV growth.
- **Innovation Metrics:** Feature performance (e.g., >50% adoption for new features within 90 days).
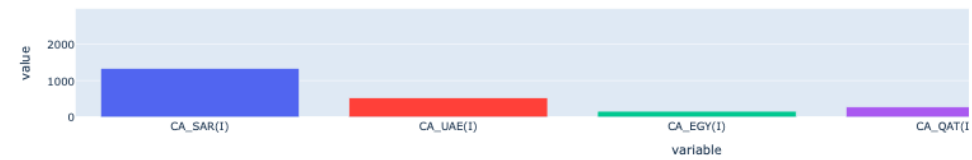
Weekly Data: Aug 4-10, 2025

Active Users (Android)

Installs (iOS)

New Downloads

Conv Rate (A): 60.08% | Conv Rate (I): 26.63% | Crashes (A): 0.29% | Crashes (I): 0.24%

Thank You!

Reference:

Dataset: Original raw dataset
Report: Access the detailed report from here