Mobile Experience Benchmark

Crittercism

Key Takeaways

Mobile App Complexity

Mobile app performance is challenging with over **100M** permutations of variables to manage.

App Responsiveness

To be competitive, your app should respond to user requests within **1 second.** The reality is most apps don't because they rely on unpredictable services.

App Uptime (Crash)

Your goal should be to have an app that crashes less than **1%**. Most apps crash more.

Introduction

Mobile apps live in a complex environment that makes it difficult to manage performance and ensure superior user experience. The two pillars that comprise mobile app performance are:

1. **App uptime**
2. **App responsiveness**

Crittercism is the leading mobile application performance management (mAPM) solution that processes over 30,000 requests per second from over 1B mobile users in real-time. We've gathered rich performance data and are honored to share the **first-ever mobile experience benchmark report** with the world.

This report uses *data from Crittercism customers actively optimizing their app performance*. App performance across un-optimized applications is expected to be worse.

COMPLEXITY IMPACTS

PERFORMANCE

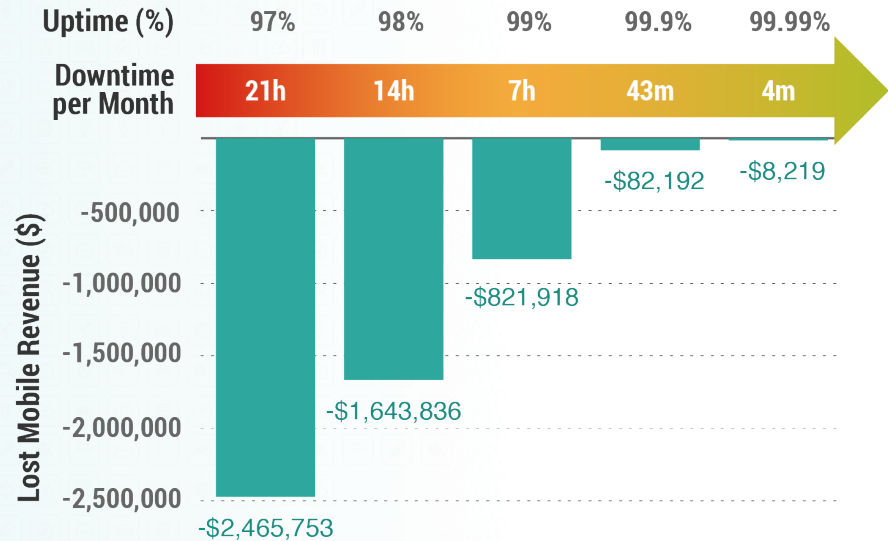UPTIME   RESPONSIVENESS

Mobile Performance Impacts Your Bottom Line

Let's look at how poor uptime could impact a company with $1B in annual mobile revenue*:

- At 97% uptime, the company would lose $2.5M per month
- At 99% uptime, the company would lose $0.8M per month
- At 99.9% uptime, the company would lose $83,333 per month

*Examples of companies with significant mobile revenue include Starbucks which Business Insider estimates drives $1B through mobile and Domino's which sees $700M in mobile sales according to Mobile Commerce Daily.

Uptime (%)	97%	98%	99%	99.9%	99.99%
Downtime per Month	21h	14h	7h	43m	4m

Lost Mobile Revenue ($)

- -$8,219
- -$82,192
- -$821,918
- -500,000
- -1,000,000
- -1,500,000
- -1,643,836
- -2,000,000
- -2,500,000
- -$2,465,753

Mobile Apps Live in a Complex World

Fragmentation adds Complexity

2582

Device manufacturer models

X

106

OS versions

X

691

Carriers

=

>100M

Permutations creates complex ecosystem

Connecting to 6+ Cloud Services Increases Complexity

Average Number of Services Used

Findings
- The average app depends on 6 cloud services (5 is the median). Examples include: Facebook for logins, Amazon Web Services for storage, and Flurry for analytics
- 43% of apps depend on over 5 cloud services

Takeaway
- Apps depend on many underlying cloud services, which means they not only need to be free of crashes, but the services they depend on must also work and be available

43%

3%

5%

9%

57%

26%

Average Number of Services Used

- 1−5
- 6−10
- 11−15
- 16−20
- >20
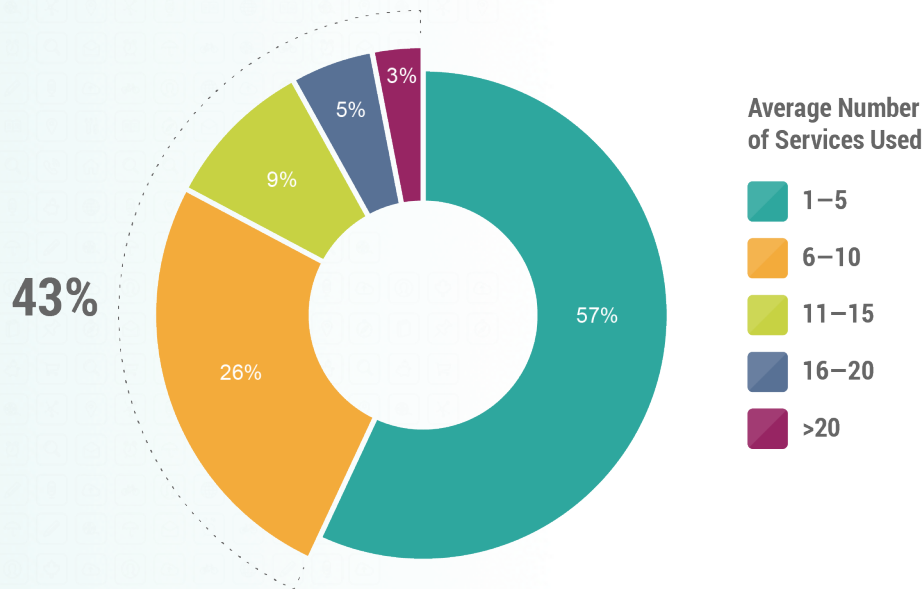
Responsiveness Performance

The two pillars of mobile app performance are responsiveness and uptime. Responsiveness of cloud services gives you insight into how much faster or slower your app is running than your benchmark or expectations.

Responsiveness helps answer questions such as:

- Which services have the highest error rates?
- Why is my app slow in different geographies?

This section will shed light on mobile app responsiveness and error rates by app, industry, and geography.

Why this matters: Your app depends on many cloud services and responsiveness impacts end-user experience

Service Calls are Unpredictable

Given that apps depend on many services, it is the aggregate performance that ultimately determines end user experience. The two metrics to focus on are **error rate** and **latency**.

Users expect responses in **under 1 second**, yet **9%** of calls experience higher latency. In addition, **21%** of service calls have over **1%** error rate.

9%

of cloud services that mobile apps use have over 1 second average latency

21%

of service calls from mobile apps have error rates over 1%

(18% of service calls have error rates of 5% or more)

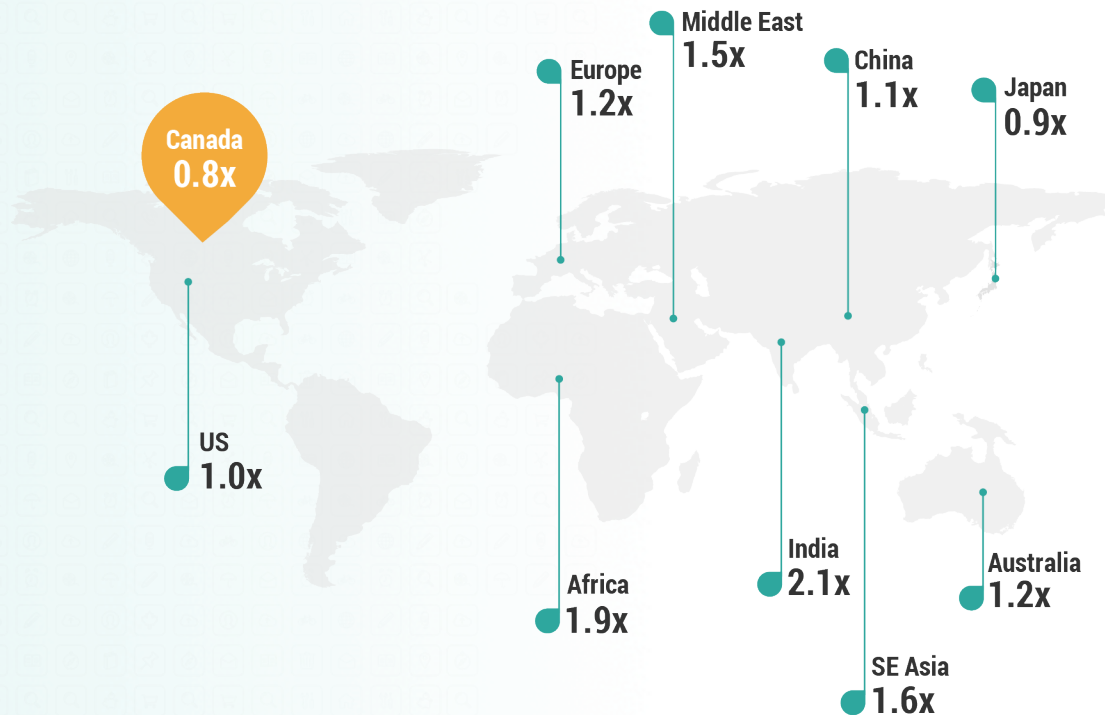# Response Times in Canada Are Fastest

Response Times by Geography

Findings
- Canada has the fastest response time at 0.8X of US
- India has the slowest response time at 2.1X of US

Takeaway
- Be prepared to deal with regional wireless networks and latencies
- App owners should optimize apps and architectures (i.e. Content Delivery Networks and regional data centers) to account for geographic variance in response times

Response times include WiFi

Canada 0.8x

Middle East 1.5x

Europe 1.2x

China 1.1x

Japan 0.9x

US 1.0x

Africa 1.9x

India 2.1x

SE Asia 1.6x

Australia 1.2x

Response Time Normalized to US

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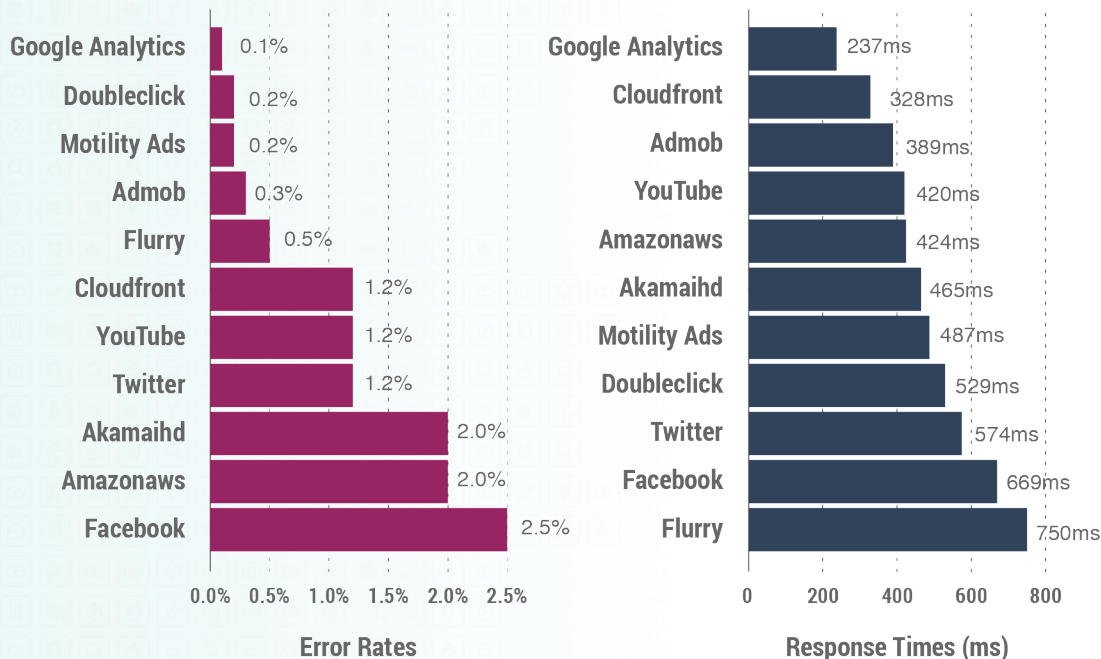
Google Analytics is Best Performing Top Service

Error Rates & Response Times by top Services

Findings
- Google Analytics has lowest error rate (0.1%); error rate is percent of errors per number of service calls made
- Of top public services, Google Analytics has lowest average latency

Takeaway
- Even top services like Google Analytics and Facebook experience latency and error rates
- Teams must manage every aspect of mobile app performance, including third-party services

Service	Error Rate
Google Analytics	0.1%
Doubleclick	0.2%
Motility Ads	0.2%
Admob	0.3%
Flurry	0.5%
Cloudfront	1.2%
YouTube	1.2%
Twitter	1.2%
Akamaihd	2.0%
Amazonaws	2.0%
Facebook	2.5%

Error Rates

Service	Response Time
Google Analytics	237ms
Cloudfront	328ms
Admob	389ms
YouTube	420ms
Amazonaws	424ms
Akamaihd	465ms
Motility Ads	487ms
Doubleclick	529ms
Twitter	574ms
Facebook	669ms
Flurry	750ms

Response Times (ms)

Uptime Performance

In addition to responsiveness, the other main culprit of app performance issues is app uptime. Uptime is the percent of app usage that did not experience a crash.
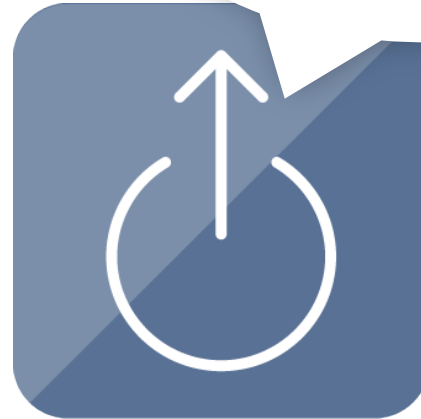
Uptime helps answer questions such as:

- Which devices are causing my app to crash?
- Does my app crash more on a particular OS version?

This section will reveal the acceptable uptime performance of mobile apps. It will also provide data across app categories and industries.

Why this matters:
Uptime performance is a fundamental measure of end-user experience

# 47% of Apps Have an Uptime That is not Competitive

Percent of apps by crash uptime

Findings
- 47% of apps crash more than 1% of the time
- 32% have a crash rate over 2%

Takeaway
- To remain competitive, your app should have a crash rate under 1% (uptime of 99%)
- Uptime of mobile apps is lower than web counterparts, where the norm is 99.9%

1% crash rate is based on customers actively using Crittercism. Apps in the wild can experience anywhere from 3-10% crash rate.

47%

32%

53%

15%

Crash Rate Range

0−1% (99−100% uptime)

1−2% (98−99% uptime)
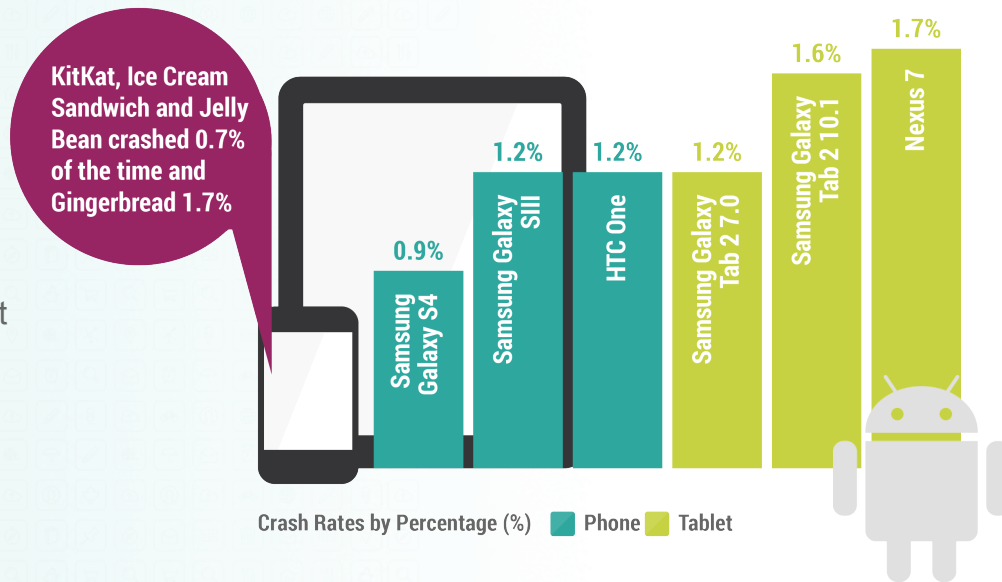
2%+ (>98% uptime)
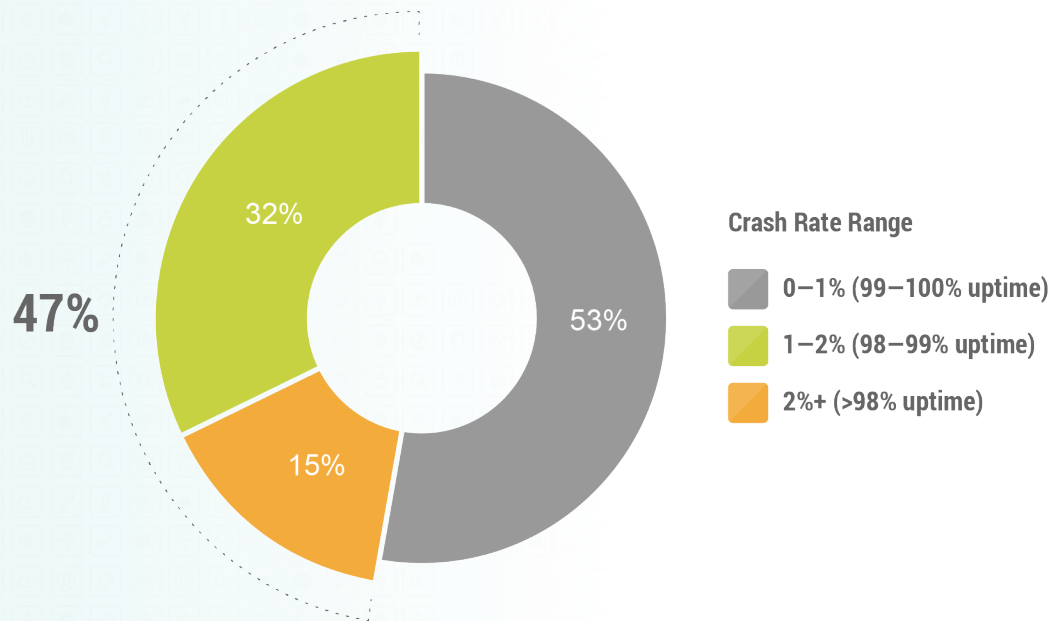
Android: Gingerbread Apps Least Stable

Android OS and device breakdown

Findings
- Gingerbread has the highest crash rate
- Samsung owns the top spots for both Android phones and tablets stability
- Android tablets have worse crash rates than Android phones

Takeaway
- While KitKat is the newest release, teams must continue to optimize for older versions. In particular, Gingerbread is the least stable but widely used.
- Expect users on Android tablets to experience more crashes than Android phones.

KitKat, Ice Cream Sandwich and Jelly Bean crashed 0.7% of the time and Gingerbread 1.7%

Samsung Galaxy S4 — 0.9%
Samsung Galaxy SIII — 1.2%
HTC One — 1.2%
Samsung Galaxy Tab 2 7.0 — 1.2%
Samsung Galaxy Tab 2 10.1 — 1.6%
Nexus 7 — 1.7%

Crash Rates by Percentage (%) ■ Phone ■ Tablet

Apple: iOS 7.1 Apps Most Stable
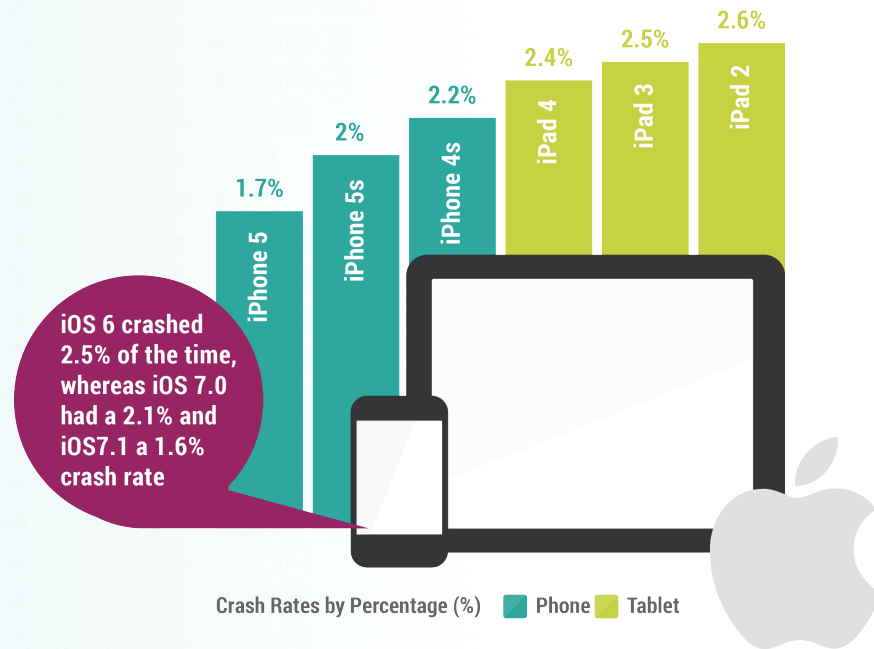
Apple OS and device breakdown

Findings
- iOS 7.1 has lowest crash rate
- iPhone 5 crashes least
- Apps on iPhones are more stable than iPads
- Older iPads crash more

Takeaway
- While most users are on iOS 7, iOS 6 has a higher crash rate and cannot be ignored
- Expect iPad users to experience stability issues more than those using iPhones

iOS 6 crashed 2.5% of the time, whereas iOS 7.0 had a 2.1% and iOS7.1 a 1.6% crash rate

1.7% — iPhone 5
2% — iPhone 5s
2.2% — iPhone 4s
2.4% — iPad 4
2.5% — iPad 3
2.6% — iPad 2

Crash Rates by Percentage (%) ■ Phone ■ Tablet

Gaming Apps Least Stable

Crash Rate by App Category

Crash Rates (%)

Findings
- Gaming apps have the highest crash rate (4.4%)
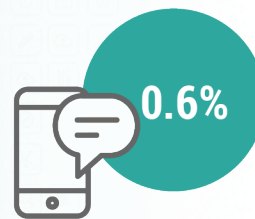- Ecommerce apps have the lowest crash rate (0.4%)

Takeaway
- Graphics intensive apps such as Gaming, Media, Photo, & Video apps crash most
- Apps that enable transactions crash less, but the cost of downtime is significant. Pay close attention to the performance of these apps
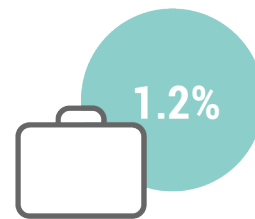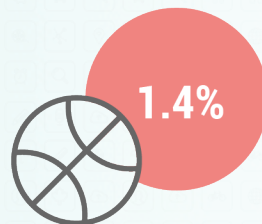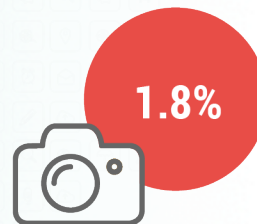
0.4% Ecommerce

0.6% Social & Communication
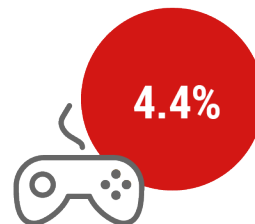
1.2% Business

1.4% News, Sports, & Entertainment

1.8% Media, Photo, & Video

4.4% Gaming

Improving mobile app performance is critical

2014 will continue to be a huge year for mobile. Businesses will sharpen their focus from web to mobile, and leverage apps to increase revenue and productivity. In addition, users will demand better performance from mobile apps.

Companies that have consistently delivered top user experience use a mobile APM solution to optimize their apps.

To learn more about Crittercism's mobile app performance management solution, visit WWW.CRITTERCISM.COM
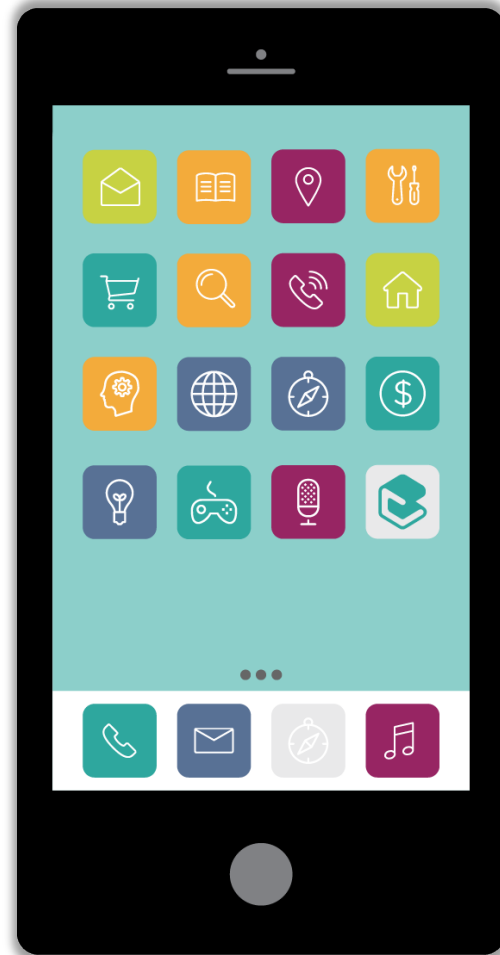
Real Business ROI

Crittercism has worked with thousands of customers across multiple industries to improve their mobile apps and experience. Below is a glimpse into the achievements of customers.

	ISSUE	BEFORE	AFTER	IMPACT
HEARST	Monetize through mobile channel while creating best user experience	3% downtime across all platforms	< 0.5% downtime across all platforms	**83%** improvement in uptime 2 stars → 4+ stars
DocuSign	Poor visibility into app issues affecting users	2 weeks to resolve issues causing downtime	Resolve most issues in 2 days	**14X** more efficient at resolving critical crashes **2X** faster app releases
URBAN OUTFITTERS	App performance issues affecting user experience	6% downtime	<1% downtime	**7x** performance improvement **6x** revenue improvement

Glossary & Methodology

- **MAU**: Monthly Active Users are the unique end-users on a mobile app during a given month
- **DAU**: Daily Active Users are the unique end-users on a mobile app on a given day
- **Responsiveness**: Time it takes for each service call to respond
- **Uptime**: Availability of the mobile app; percentage of app loads that do not result in a crash
- **Crash rate**: Percentage of app loads that result in a crash
- **Error rate**: Percentage of HTTP or network errors an app experiences while making cloud service API calls
- **Service**: One or more endpoints providing a function that can be accessed by clients over the web. Example: s3.amazonaws.com
- **Endpoint**: Specific API on a cloud service. Examples include account creation, check-out, or in-app purchase

Methodology
We've gathered data from nearly 1B users and analyzed 3B+ events/day over a month.