

Understanding UX

And approaches to measuring & testing UX

Selenium Conference, Bangalore 2016

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Understanding UX

Get there
Your day belongs to you

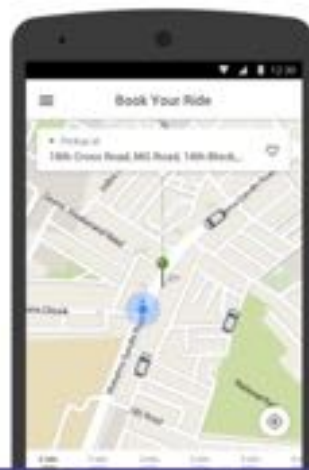


Start riding with Uber
SIGN UP →



Welcome to Bengaluru City Taxi Service :

Book a Cab with one among the experienced cab service provider. Bangalore City taxi is the one of the competent name in the Bengaluru International Airport taxi Service agencies in the City. We offer 24 hours city taxi service as well as all type of tourist cabs with and without A/C. BCT Provide various type of call taxi in for personal and commercial use.



Pickup from anywhere.
Search or move pin to pickup location and tap *Ride now*.



Save time in managing travel for your company. Bring down your company's travel expenses.

FIND OUT HOW

UX = User Experience

- Dynamic, based on *using* the system



- Affected by expectations, mood, situation, etc

Digital & Analogue UX

Measuring UX

Measuring Digital UX

Click Through Rate (CTR)

Time...

Usage

Retention

Crashes

Usability including Task Completion

Measuring Analogue UX

- Interviews
- Recordings (explicit and implicit)
- User Initiated Feedback

- Surveys
- Net Promotor Score (NPS)
- In app feedback

4.4 \rightarrow 4.3 = ?

Cause & Effects



Tap on the colour you prefer to continue the game.



Tippen Sie auf die Farbe, die Sie bevorzugen, das Spiel fortzusetzen.

Appuyez sur la couleur que vous préférez pour continuer le jeu.

ඔබ ක්‍රීඩාව දිගටම කැමති වර්ණය මත තට්ටු කරන්න.

A banking example

Customer Ratings

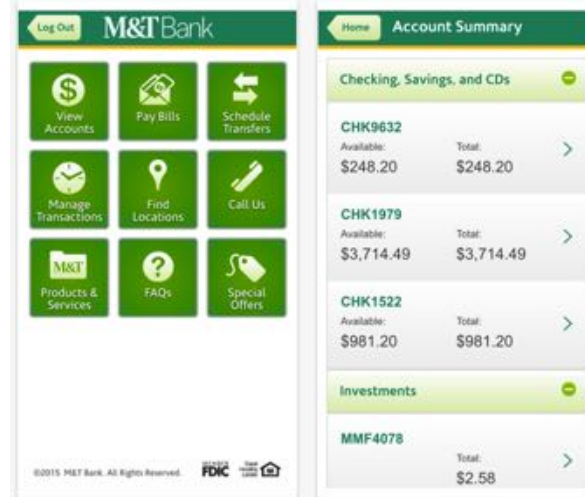
Current Version:

★ 54 Ratings

All Versions:

★★★ 754 Ratings

iPhone Screenshot



Customer Reviews

Touch ID login ★★★★★
by Robert96Daniel

This app is awesome. It's easy to navigate and with its simple interface and beautiful integration of the banks color scheme it's a beauty to use for checking my balance. With that in mind, I gave this app only 4 stars because without the Touch ID login that some other financial apps utilize, logging in each time gets frustrating. Other than that, the app is a huge and amazing upgrade considering the app prior to this new release!

Needs Some Work ★★★
by Gdsyhwtdv

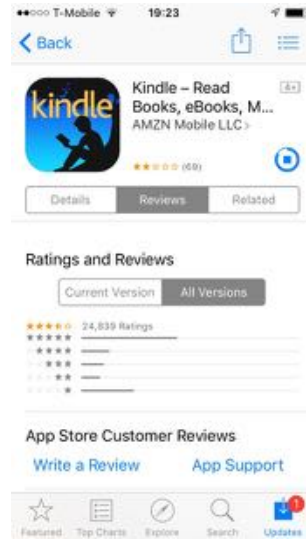
Does what I need it to do, when I can actually sign in. If I'm not on Wi-Fi I have to enter my password 3-5 times before it will let me sign in, and sometimes even then I still can't get in. I once even had to call to reset my password because of this as it locked me out. Also, as others have stated, touch id would be a very welcome addition. This is one of very few apps I've seen that requires a login that doesn't utilize touch id.

The worse App in the App Store. ★
by Jamzxoko

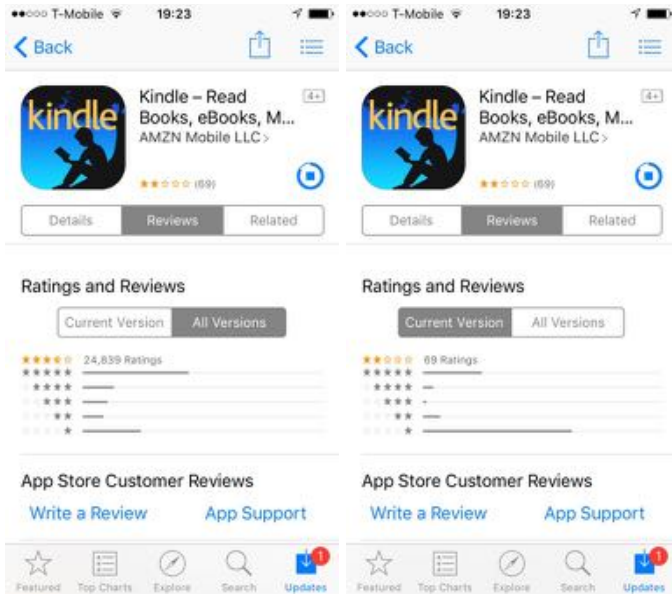
I love M&T as a financial institute but have to wonder, Are things well at M&T? The mobile app is the absolute worse. Once I break off of my home Wi-Fi the app does not work at all. It does not work when I need it the most. Mobile bank is not new technology. WHY can't you people fix this app so that it works right. Good luck with mobile check deposit. It's going to be a while before we see that. You have to completely rebuild the current app. I'm an embarrassed customer.

<https://itunes.apple.com/us/app/m-t-mobile-banking/id397761931?mt=8>

Kindle App for iOS



Kindle App for iOS



Customer Ratings

Current Version:

★★★ 22 Ratings

All Versions:

★★★★ 222887 Ratings

06 Apr 2016



Customer Ratings

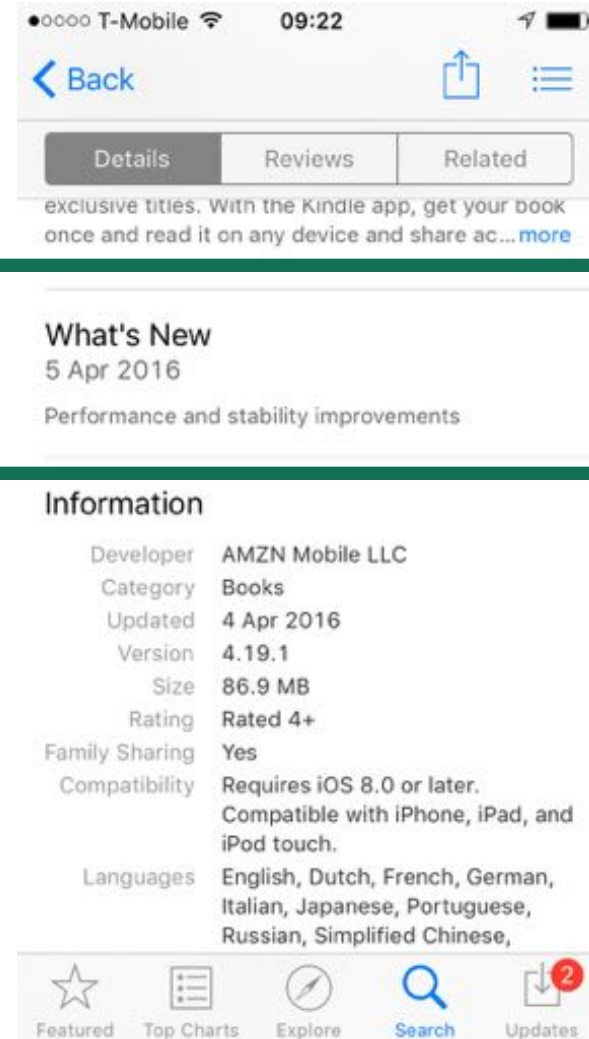
Current Version:

★★★★ 565 Ratings

All Versions:

★★★★ 25393 Ratings

03 May 2016



What's New

5 Apr 2016

Performance and stability improvements

Information

Developer AMZN Mobile LLC

Category Books

Updated 4 Apr 2016

Version 4.19.1

Size 86.9 MB

Rating Rated 4+

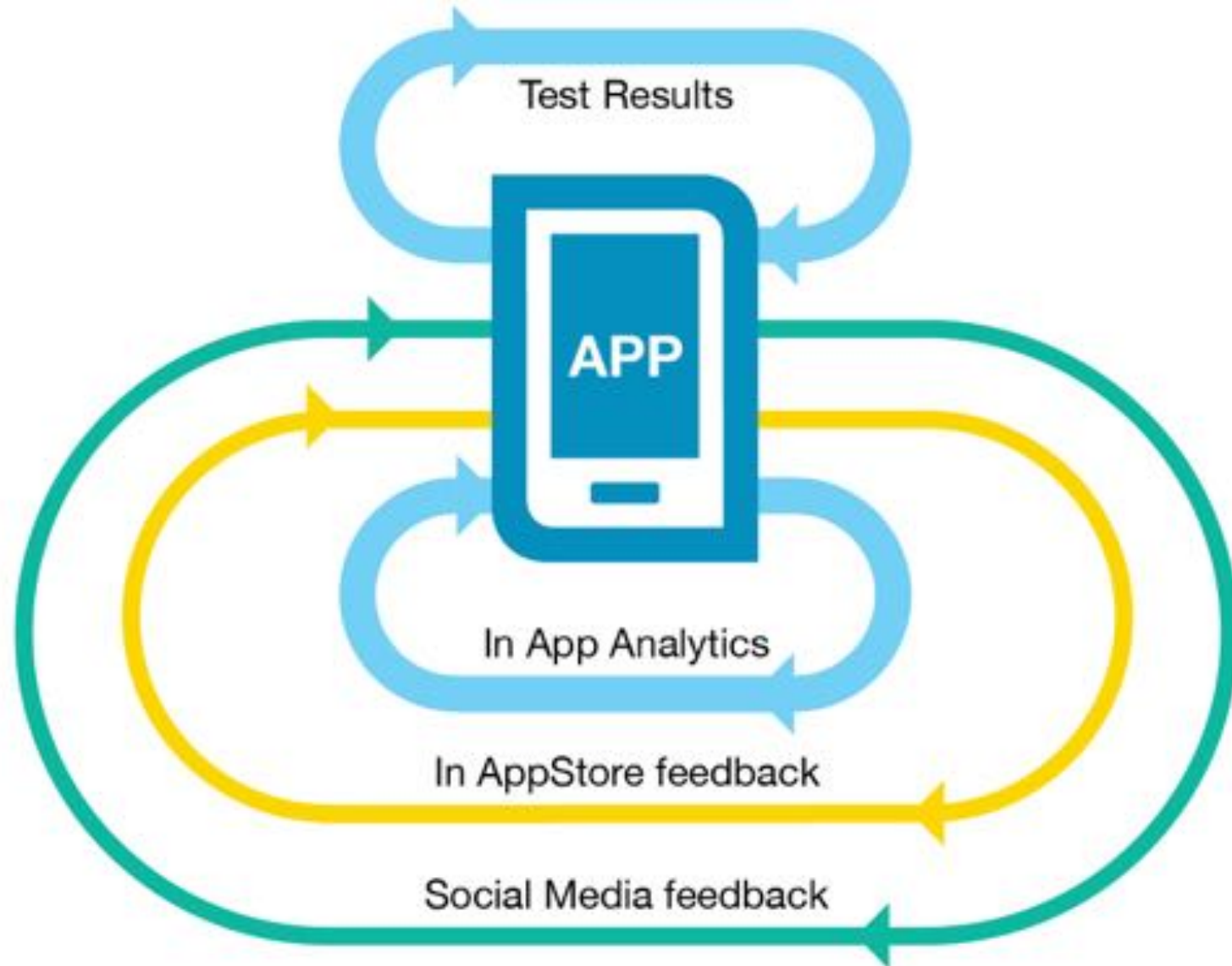
Family Sharing Yes

Compatibility Requires iOS 8.0 or later.
Compatible with iPhone, iPad, and iPod touch.

Languages English, Dutch, French, German, Italian, Japanese, Portuguese, Russian, Simplified Chinese,

Use Analytics & Heatmaps

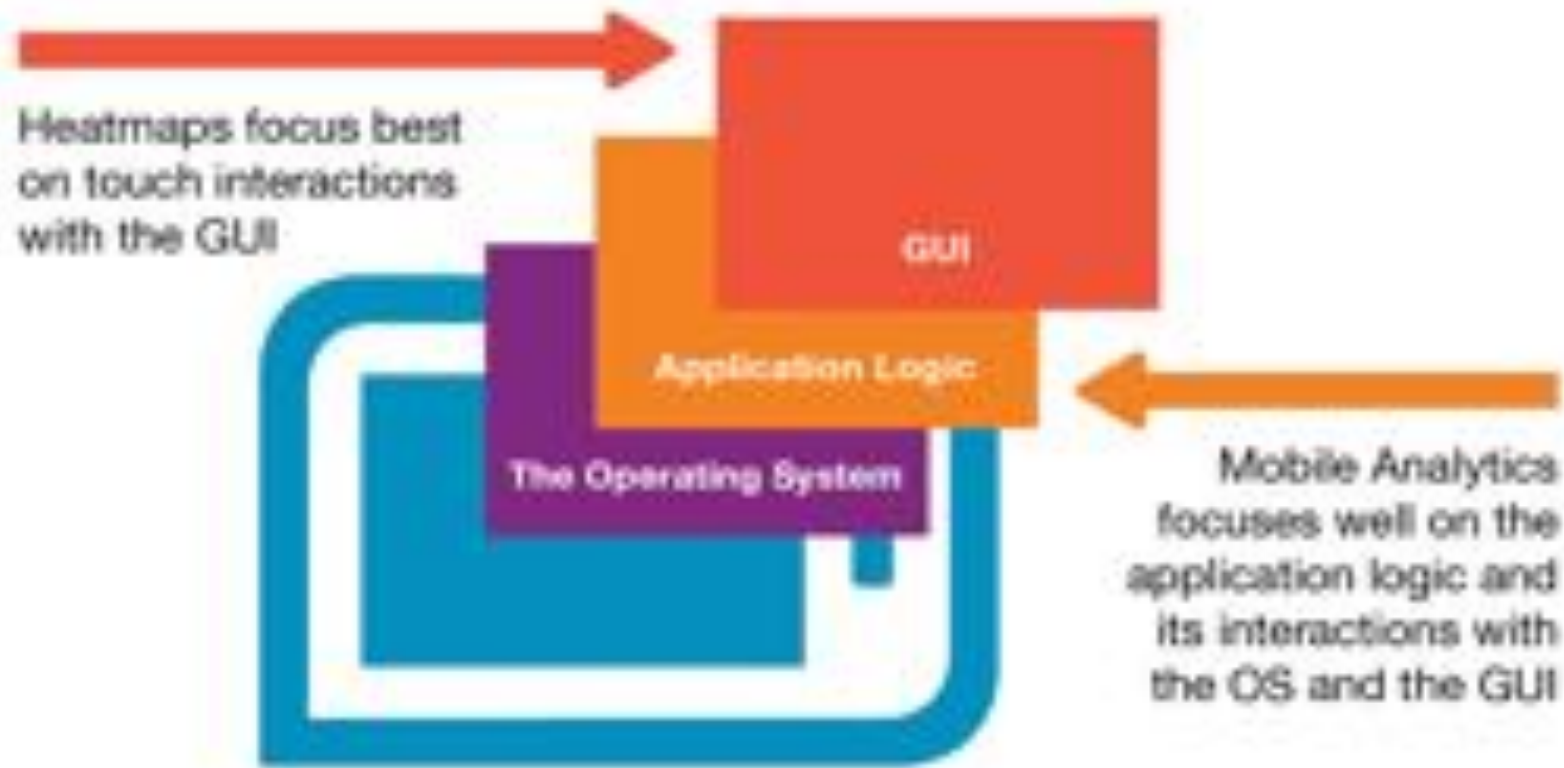
Feedback Cycles



Some benefits of analytics data

- No longer limited to what “we” think “they” need/do/etc. Discover how the app behaves across virtually all the population
- Lower cost of operations
- Real usage can help drive our testing and analysis; brings realism to our testing

Layers of an App



Exploded view of the app running on the platform

Heatmaps



Problematic UI



Heatmap

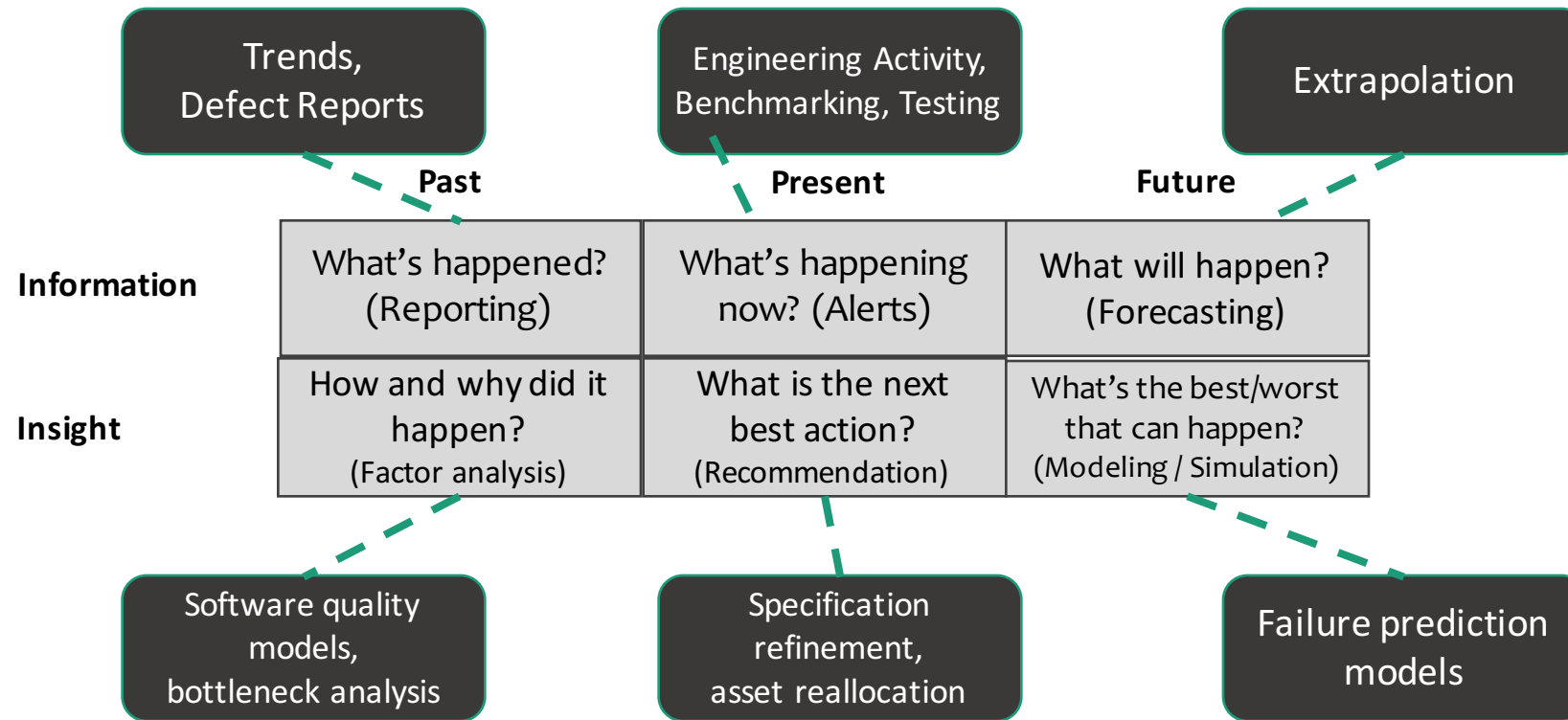
“8 Heatmap Tests that reveal visitor behavior.”

1. [The Link Test](#) - Are visitors clicking on dead ends?
2. [The Distraction Test](#) - Are irrelevant elements distracting visitors?
3. [The Information Test](#) - Is there missing information from your page?
4. [The Device Test](#) - Does your page work on different screen sizes?
5. [The Depth Test](#) - Is all your content easily reachable?
6. [The Engagement Test](#) - What are your site visitors really looking for?
7. [The Fold Test](#) - Does your page have what it takes to keep your visitors?
8. [The Header Test](#) - Is your page header helping or hurting your site?

Source: <https://www.hotjar.com/heatmaps>

Images source: [Appsee.com](https://www.appsee.com)

Analytics for Software Development



Gaining confidence

Fools rush in...

Precision & accuracy



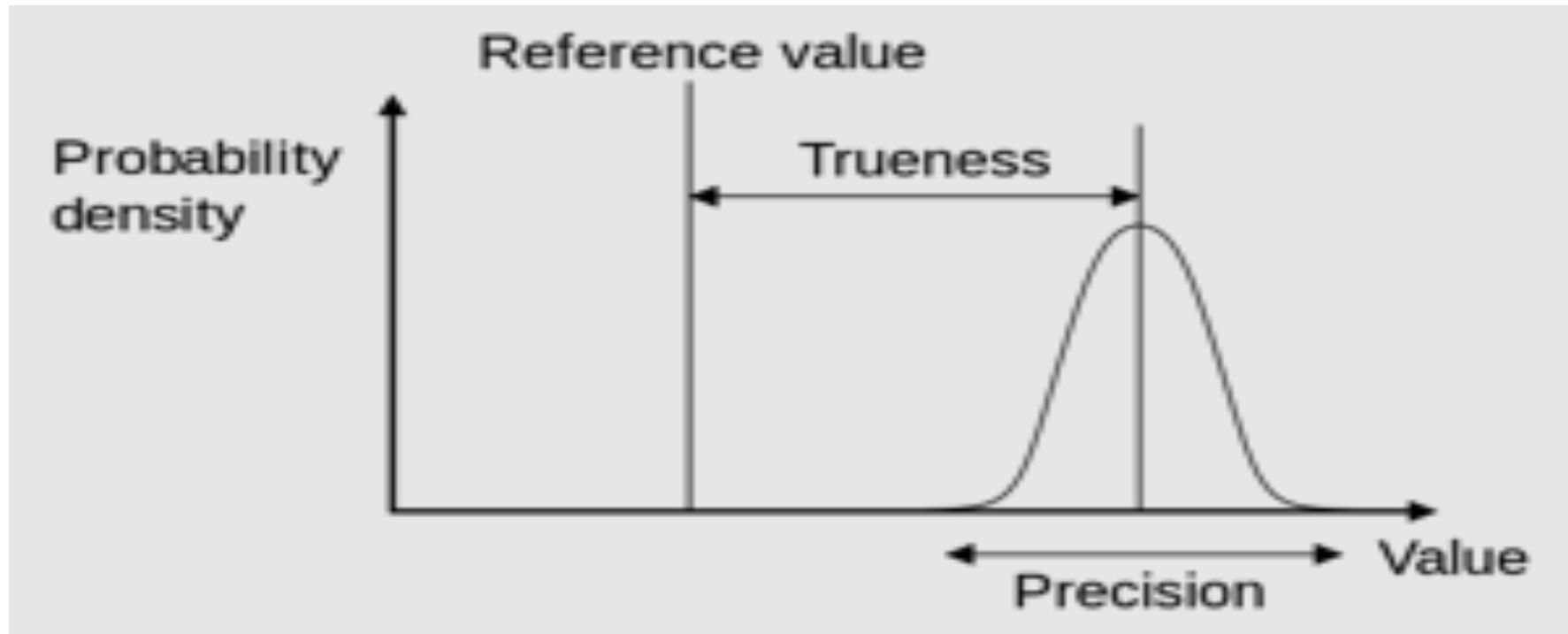
Precision: repeatability

https://en.wikipedia.org/wiki/Accuracy_and_precision

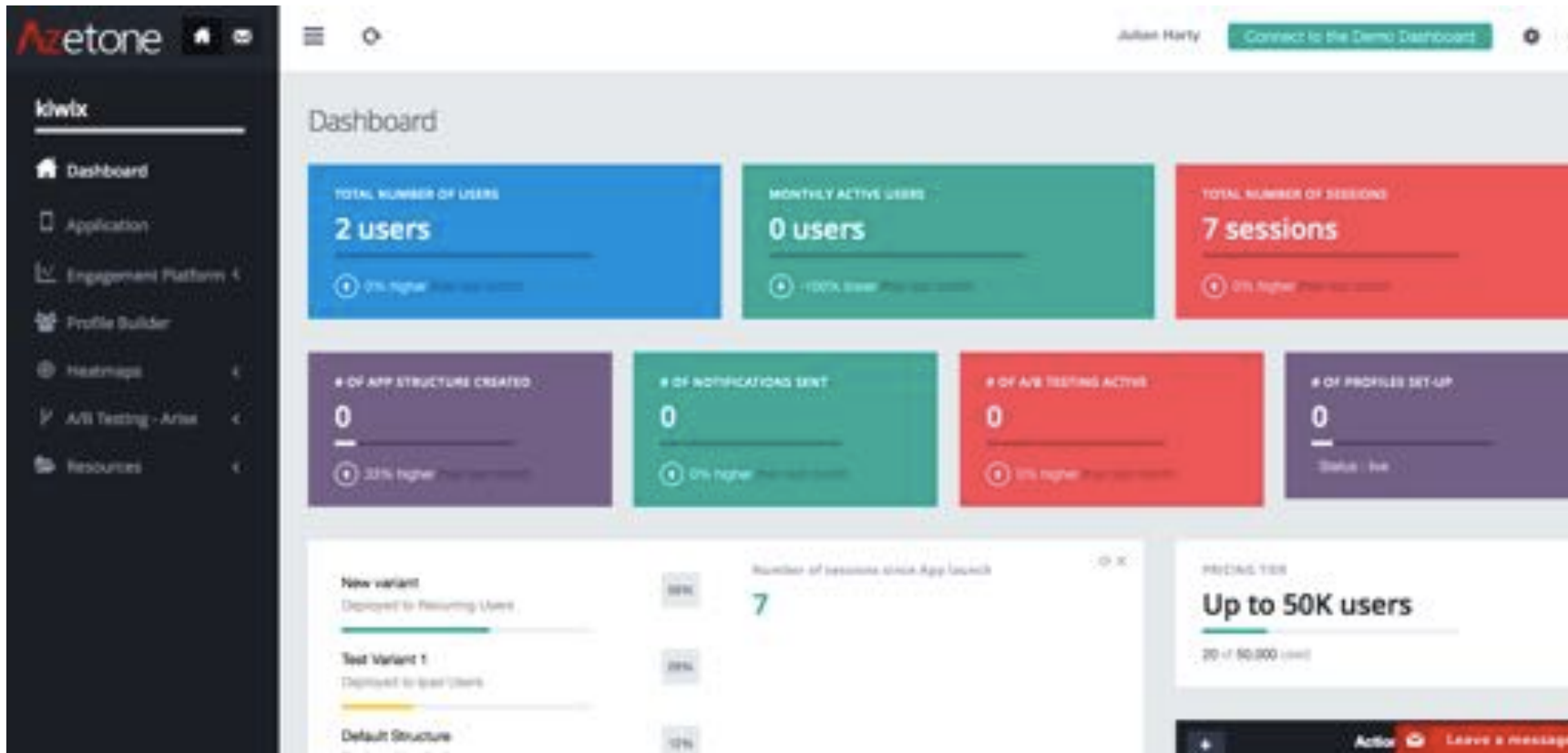


Accuracy: on target

Precision & accuracy



A system at rest?



Divergent answers increase doubt

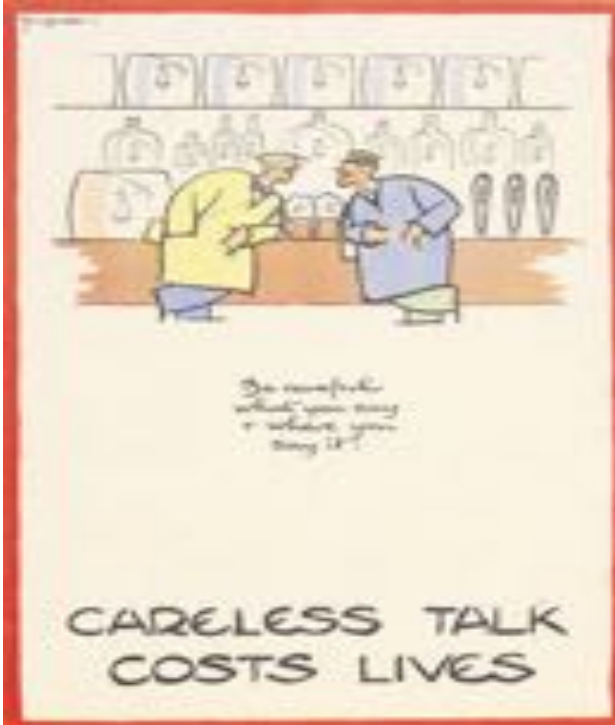
- * A tale of ~~two~~ three mobile analytics libraries
- * (and what happens when bonuses are on the line...)

- * Who is Responsible (part 1)?

The Dark Side

Of using Mobile Analytics

Do no harm



THIS POPULAR FLASHLIGHT APP HAS BEEN SECRETLY SHARING YOUR LOCATION AND DEVICE ID

MORE THAN 50 MILLION USERS WERE LEFT IN THE DARK ABOUT HOW BRIGHTEST FLASHLIGHT SHARED THEIR LOCATION AND DEVICE INFORMATION WITH THIRD PARTIES.



Blog

iOS Apps Caught Using Private APIs

October 18, 2015

CHINESE TAOMIKE MONETIZATION LIBRARY STEALS SMS MESSAGES

Palo Alto Networks WildFire has captured over 18,000 Android apps that contain this library.

(October 21, 2015)

Who is Responsible (Part 2)?

<http://www.vam.ac.uk/users/node/1777>

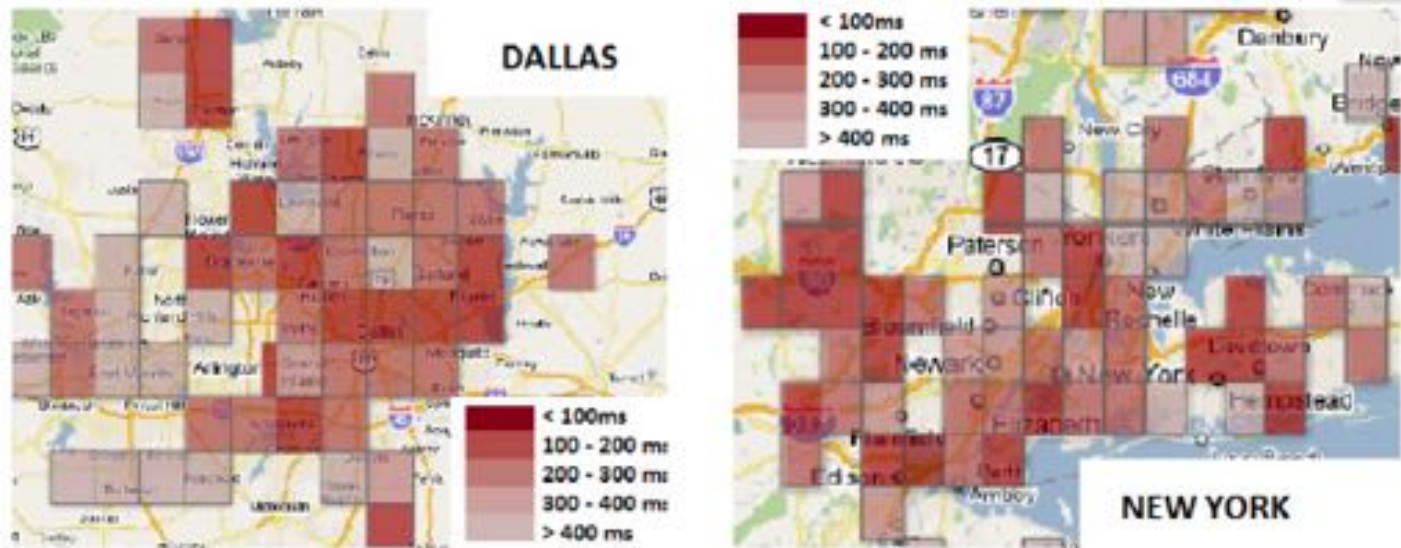
A Study of Third-Party Tracking by Mobile Apps in the Wild
<ftp://ftp.cs.washington.edu/tr/2012/03/UW-CSE-12-03-01.PDF>

<https://sourcedna.com/blog/20151018/ios-apps-using-private-apis.html>

<http://researchcenter.paloaltonetworks.com/2015/10/chinese-taomike-monetization-library-steals-sms-messages/>



Reducing precision to protect privacy



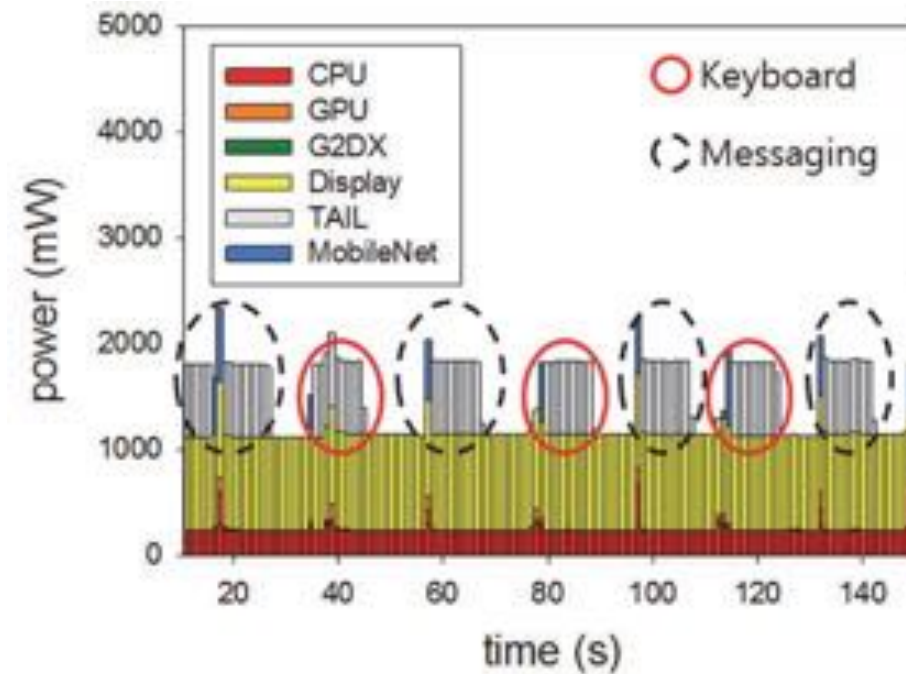
10km x 10km squares

From: Capturing Mobile Experience in the Wild: A Tale of Two Apps
Figure © ACM

Necessary but not sufficient

Listening is a means to an end

Correlation? Causation? Appropriate?



From: User Interaction-based Profiling System for Android Application Tuning
Figure © ACM

Things that might help

Us to improve UX

Assess & Respond to Feedback



Two-Star feedback is the most serious and actionable.

TABLE 3 The most frequent and impactful complaint types.*

Complaint type	Most frequent		Most impactful	
	Rank	Median (%)	Rank	1,2 star ratio [†]
Functional Error	1	26.68	7	2.10
Feature Request	2	15.13	12	1.28
App Crashing	3	10.51	4	2.85
Network Problem	4	7.39	8	2.25
Interface Design	5	3.44	10	1.50
Feature Removal	6	2.73	3	4.23
Hidden Cost	7	1.54	2	5.63
Compatibility	8	1.39	5	2.44
Privacy and Ethics	9	1.19	1	8.98
Unresponsive App	10	0.73	11	1.43
Uninteresting Content	11	0.29	9	1.50
Resource Heavy	12	0.28	6	2.00
Not Specific	—	13.28	—	3.80

* All results are at the 95 percent confidence level.

† This column indicates the ratio of one- to two-star ratings across all apps.

Khalid, H., Shihab, E., Nagappan, M., & Hassan, A. E. (2015). What do mobile app users complain about?. *Software, IEEE*, 32(3), 70-77.

96% of companies don't respond to feedback on App Stores

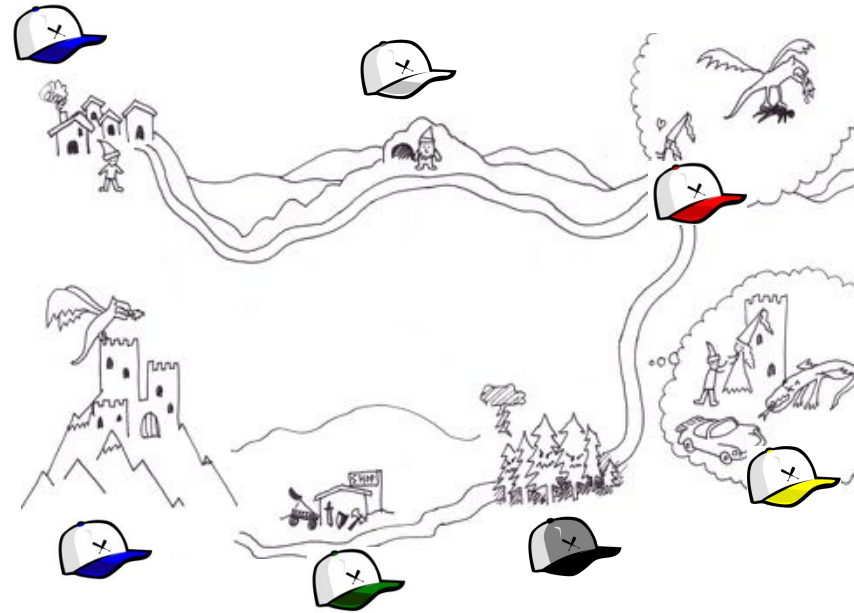
Colourful Thinking

Alfred Hitchcock

Blue Script: facts

Green Script: emotions

Six Thinking Hats



<https://www.youtube.com/watch?v=DasTbFUcmtI>



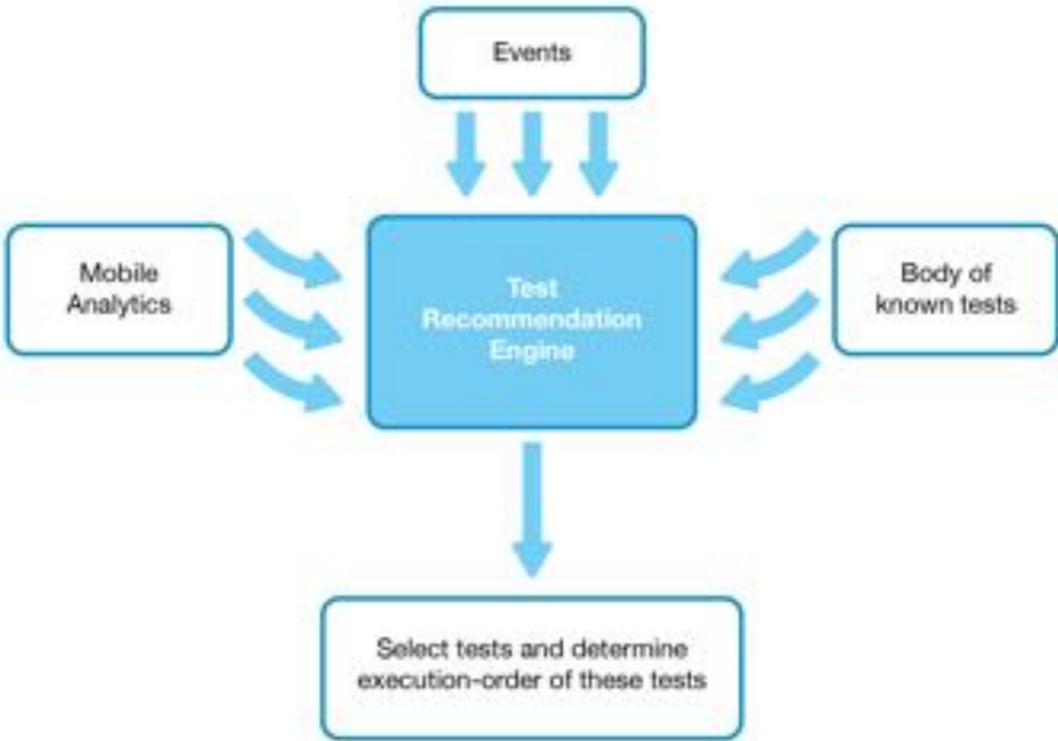
<http://uk.businessinsider.com/facebook-2g-tuesdays-to-slow-employee-internet-speeds-down-2015-10>

Use similar devices to your users



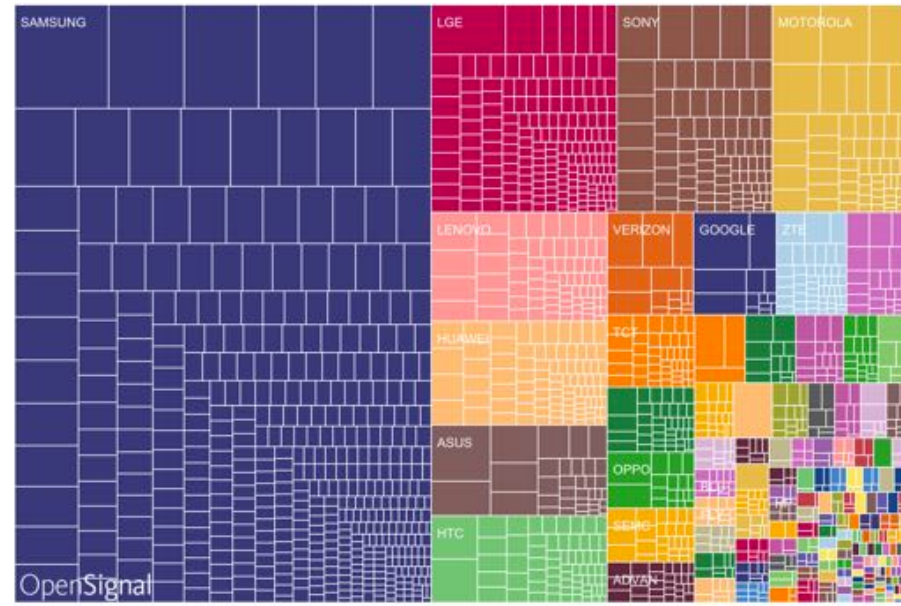
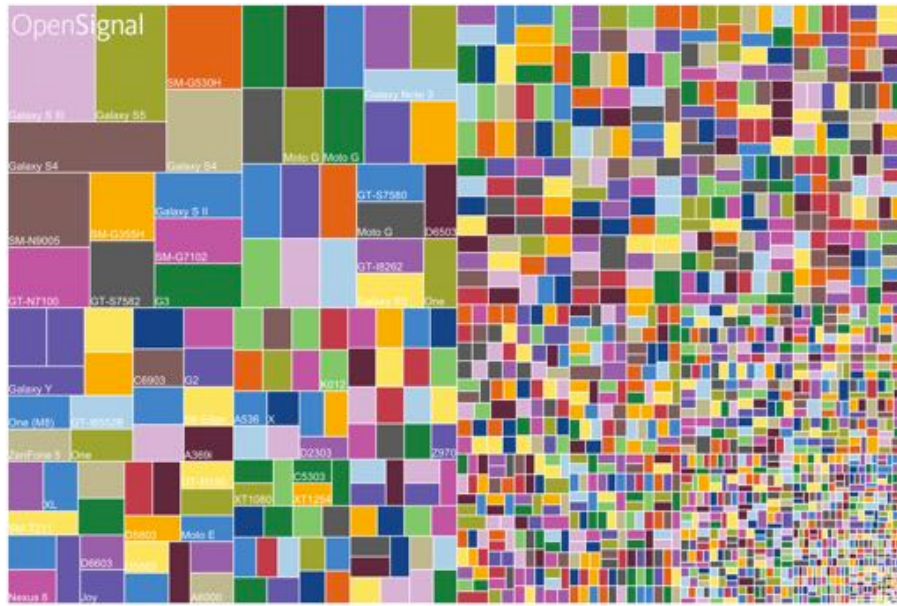
wired.com/2015/10/facebook-workers-ditch-iphones-in-push-for-world-conquest/

Test Recommendation Engine

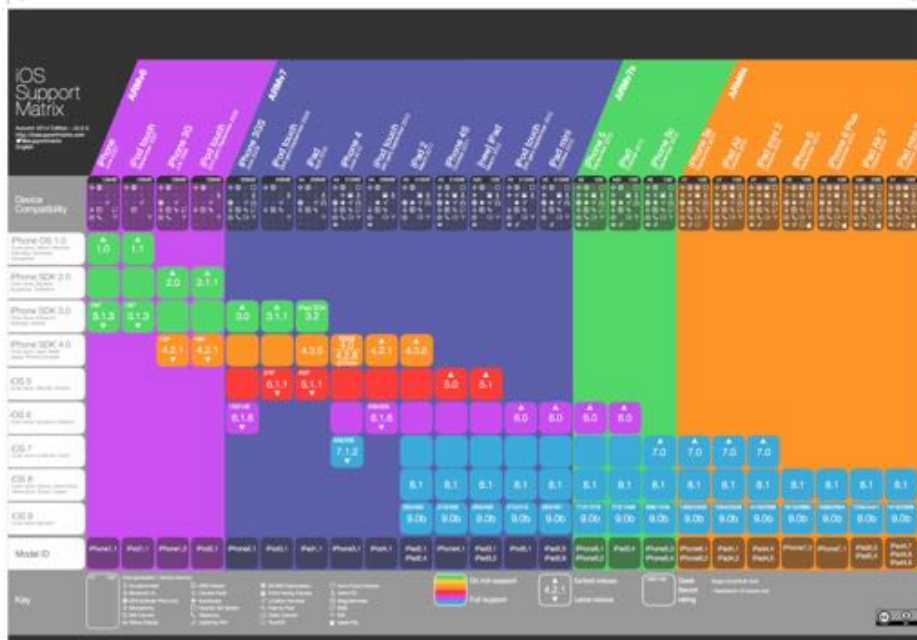


How many devices are enough?

Perennial Question



Android Images used with permission from OpenSignal.com

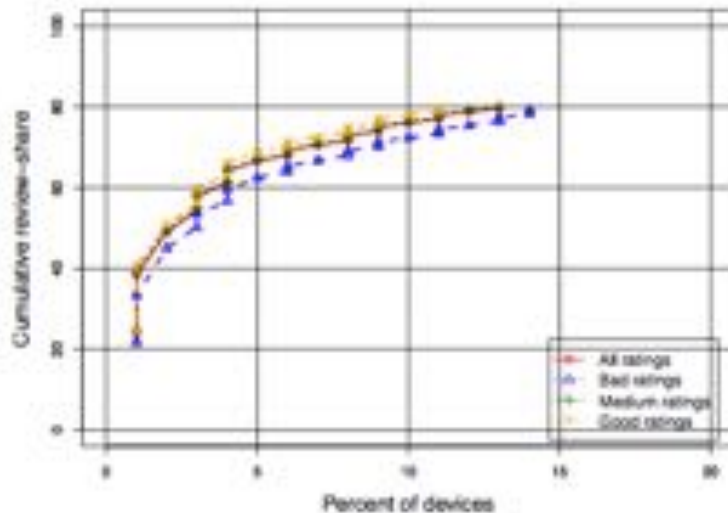
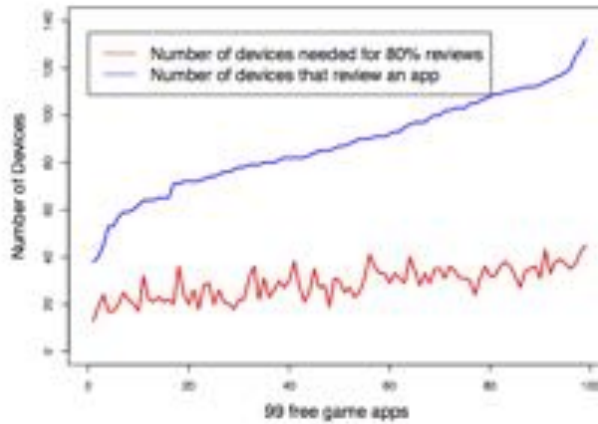


<https://iossupportmatrix.com/>

Devices Matrices

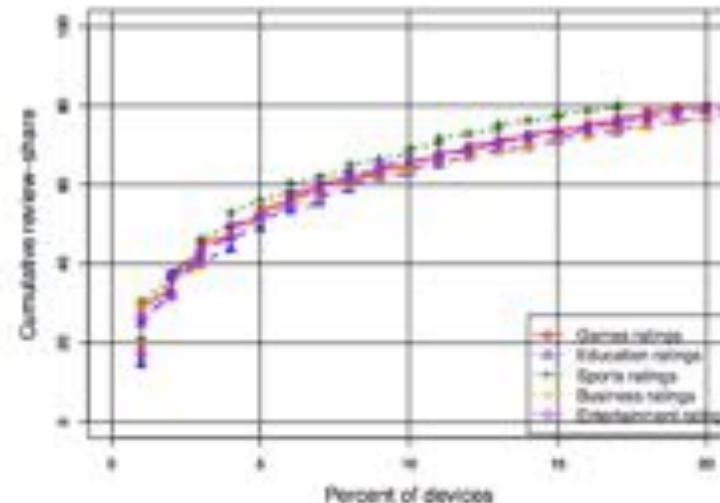
Enough for 80% of reviews

“Prioritizing the devices to test your app on : A case study of android game apps”



<= Free

Paid=>



Prioritizing The Devices To Test Your App On: A Case Study Of Android Game Apps

Hammad Khalid¹, Meiyappan Nagappan², Emad Shihab¹, Ahmed E. Hassan³
¹Software Analysis and Intelligence Lab (SAIL), Queen's University, Kingston, Canada
²Department of Software Engineering, Rochester Institute of Technology, Rochester, USA
³Department of Computer Science and Software Engineering, Concordia University, Montreal, Canada
 {hammad@cs.queensu.ca, {mei}@so.rit.edu, {shihab@cs.concordia.ca, ahmed@cs.queensu.ca}

ABSTRACT

Star ratings that are given by the users of mobile apps directly impact the revenue of its developers. At the same time, for popular platforms like Android, these apps must run on hundreds of devices increasing the chance for device-specific problems. Device-specific problems could impact the rating assigned to an app, given the varying capabilities of devices (e.g., hardware and software). To fix device-specific problems developers must test their apps on a large number of Android devices, which is costly and inefficient. Therefore, to help developers pick which devices to test their apps on, we propose using the devices that are mentioned in user reviews. We mine the user reviews of 99 free game apps and find that, apps receive user reviews from a large number of devices: between 38 to 132 unique devices. However, most of the reviews (80%) originate from a small subset of devices (on average, 33%). Furthermore, we find that developers of new game apps with no reviews can use the review data of similar game apps to select the devices that they should focus on first. Finally, among the set of devices that generate the most reviews for an app, we find that some

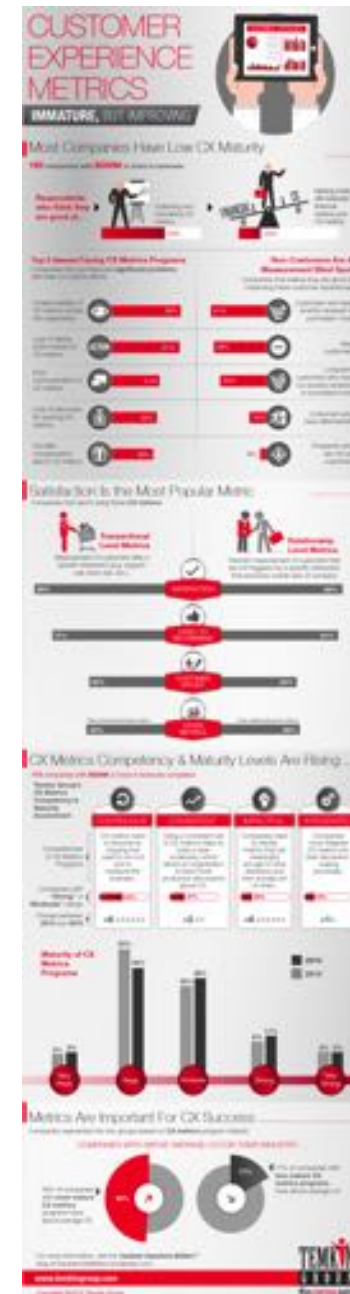
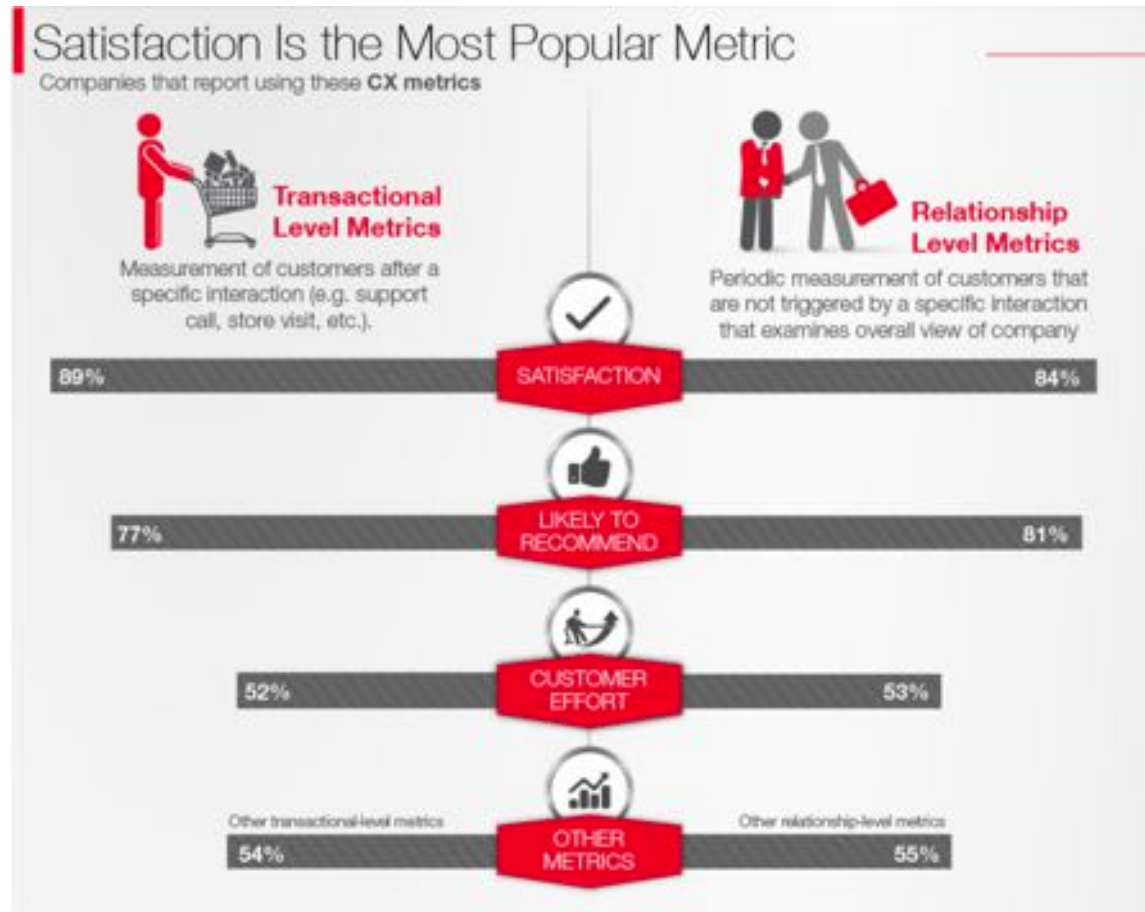
and large companies are developing an enormous amount of applications (called mobile apps), designed to run on Android devices. However, the top-rated or the featured apps in the app markets, are the apps with the most downloads, and hence the most revenue [2, 3]. Also the app market is very competitive, especially for game app developers who have to compete with almost 120,000 game apps already in the Google Play store – more than any other category of apps. To compete in this environment, developers need to get (and maintain) good ratings for their apps [2]. This can be difficult since users are easily annoyed by buggy apps, and that annoyance could lead to bad ratings [4, 5]. Hence, app developers need to test their apps thoroughly on different devices to avoid a poor rating. To make matters worse, there exists a large number of Android devices, each with its own nuances. In fact, dealing with device specific issues of (the many) Android devices is considered one of the biggest challenges developers face when creating an Android app [6]. A 2013 survey from Appcelerator, which has aggregated results from similar such surveys in the past three years, shows that

Enough for 80% of ...

- Bugs?
- Usage?
- Locales & Languages?
- Network Conditions?
- ...?

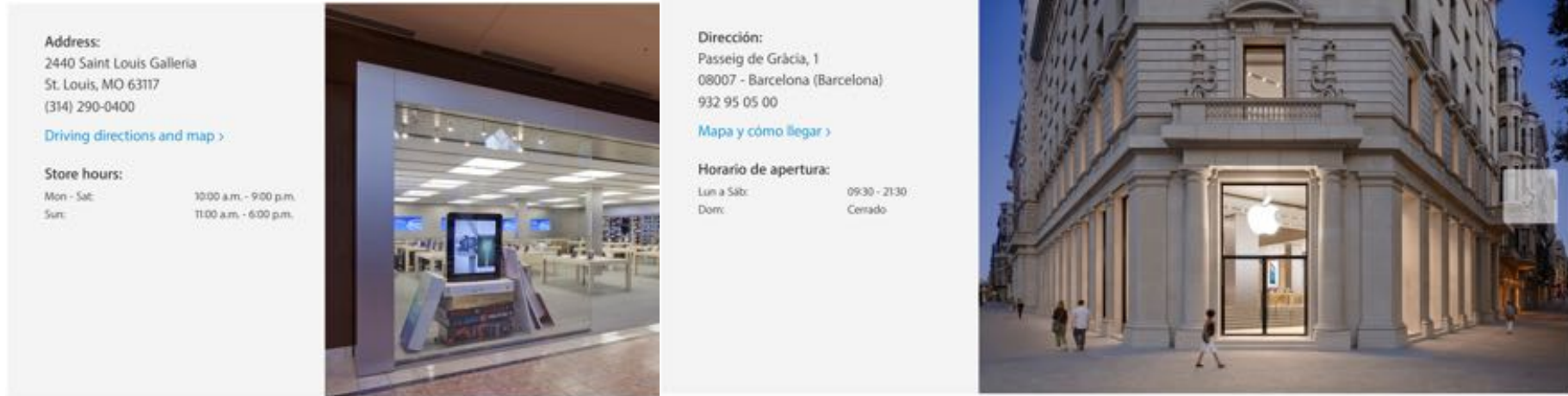
Beyond UX

Customer Experience (CX)



Good UX

Is good for business



“You have to start with the customer experience and work backwards to the technology”
Steve Jobs (1997)



Apple: The World's most valuable company (2016)

Using social networks



Julian Harty @julianharty · Mar 21
@TomTom What can I spend my £8 on - your website won't let me pay for a voice with the discount code :(I just registered a new device, etc.

TomTom @TomTom
@julianharty Hi Julian, please give our CS a quick call on: 02079 490 132

Tweets with replies by Delta Assist (@DeltaAssist) | Twitter

https://twitter.com/DeltaAssist/with_replies

The latest Tweets and replies from Delta Assist (@DeltaAssist). We're listening around the clock, 7 days a week. We try to answer all tweets but if you require a ...

Delta shows how to use Twitter in a crisis - Tnooz

<https://www.tnooz.com/article/delta-shows-how-to-use-twitter-in-a-crisis/>

To this end, Twitter seems to have been a solid case of how this can work. ... The Delta Assist Tweet Team – yes, we can identify the nine team members: ...

In the news



Delta changes way it uses Twitter to assist customers - Atlanta Business Chronicle

Atlanta Business Chronicle · 5 hours ago

Delta Air Lines Inc. (NYSE: DAL) is changing the way it uses Twitter to help customers.

[More news for delta uses twitter](#)

Delta Uses Twitter to Rebook Flights - Zendesk

<https://www.zendesk.com/blog/deltas-team-twitter/> · Zendesk

Jan 11, 2011 - As we noted here before, Delta emerged from the recent East Coast blizzards as something of a "Twitteneer," a word we just coined (we think), ...

- Immediate
- Low cost to use
- An understood, accepted protocol

versus

- In-house projects
- Expensive, time-consuming
- (Yet) another app...

“The ‘package’ is much the same, it’s all about the service we [the crew] provide”



https://en.wikipedia.org/wiki/Virgin_Atlantic#/media/File:Virgin_Atlantic_A340-300_G-VHOL_LHR_2003-6-12.png



The Den

Calling all gamers and film buffs, the Den is the place for you. Have a pool contest or try your hand at the latest games on the retro video games consoles. Our state of the art multiscreen shows the cream of the crop of TV and film as well as the latest news and sport.



The Lodge and Viewing Deck

Passengers looking to unwind can visit The Lodge with its après-ski vibe. Or if you're looking for peace and quiet, our specially designed Viewing Deck offers great views of the runway and the setting sun, with comfortable seats making it the perfect place for a preflight snooze.



The Loft

For the ultimate preflight indulgence, climb the white marble stairway that leads through the 'clouds' of the ceiling to the pièce-de-résistance of the Clubhouse - The Loft. Watch the planes takes off through full-width sloping windows underneath a dramatic skylight.



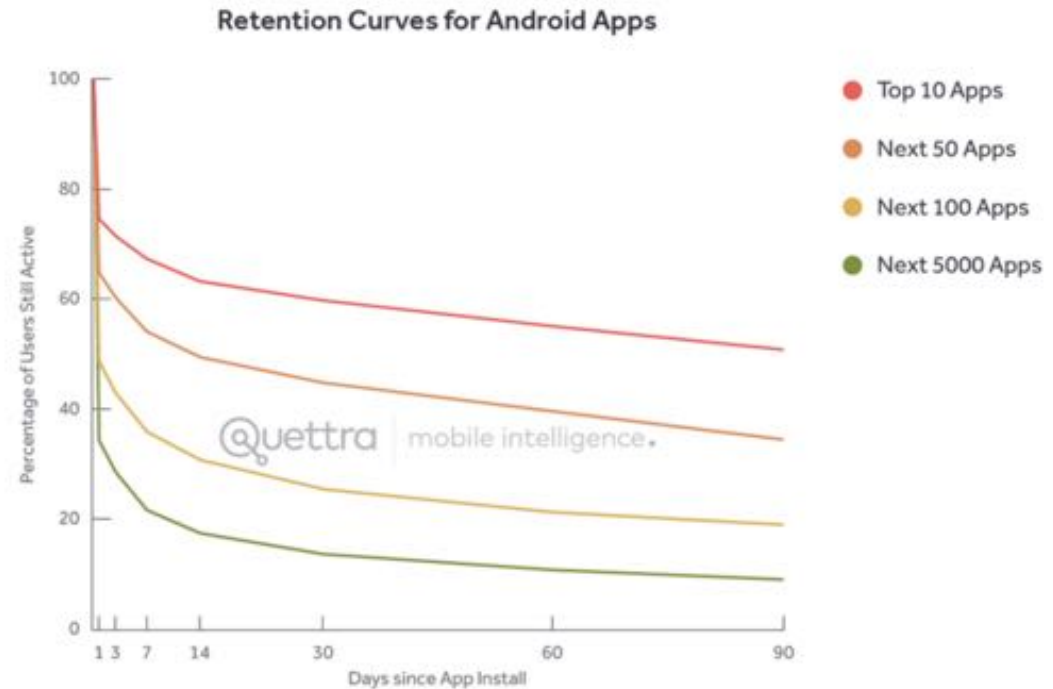
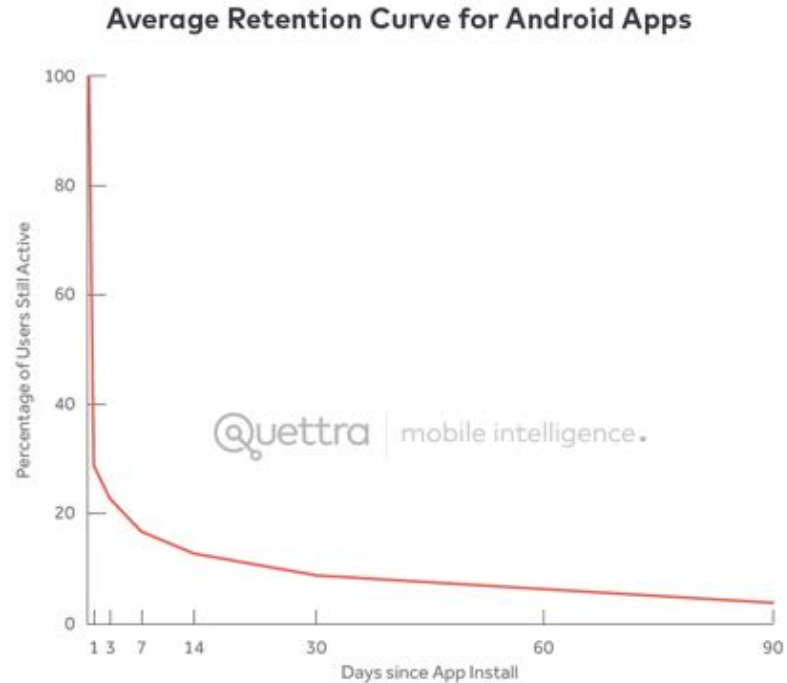
Stretch out, sleep sound

Our 33in wide, fully flat beds are super-comfy, even if you're a light sleeper. And if you'd rather stay awake there's lots to keep you entertained.

> [Explore the Upper Class Suite](#)

<http://www.virgin-atlantic.com/us/en/the-virgin-experience/upperclass.html>

Engaging users



<http://andrewchen.co/new-data-shows-why-losing-80-of-your-mobile-users-is-normal-and-that-the-best-apps-do-much-better/>

Other Drivers

What else do we need to consider?

Seismic Disruptions

- Banking
 - FinTech: eats into profitable segments
 - Freedom and ease to switch
<https://www.simplerworld.co.uk/>
- Pensions
 - “Freedom and choice” legislation in 2014
<http://www.pensionsadvisoryservice.org.uk/>
- Transportation
 - E.g. Uber, Google Maps
- The Web
- Mobile apps



Conclusions



We need to innovate to survive & thrive
Digital is a key driver, yet we need to
keep analogue in mind

*We care enough about
our users to change
what we do*

<http://paulgraham.com/siliconvalley.html>

Image: https://en.wikipedia.org/wiki/History_of_Buffalo,_New_York

READ THIS BOOK 😊



Questions now?

Questions later...
julianharty@gmail.com

<http://themobileanalyticsplaybook.com/>