

Mobile App testing

Is it really that different?

Ashley Whitehead

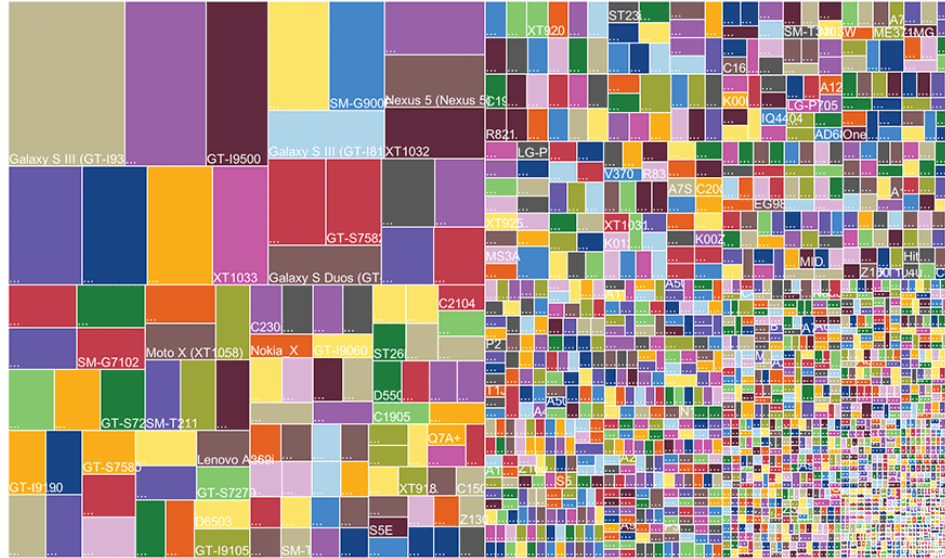
Fundamentally Technology Consulting

YES and NO

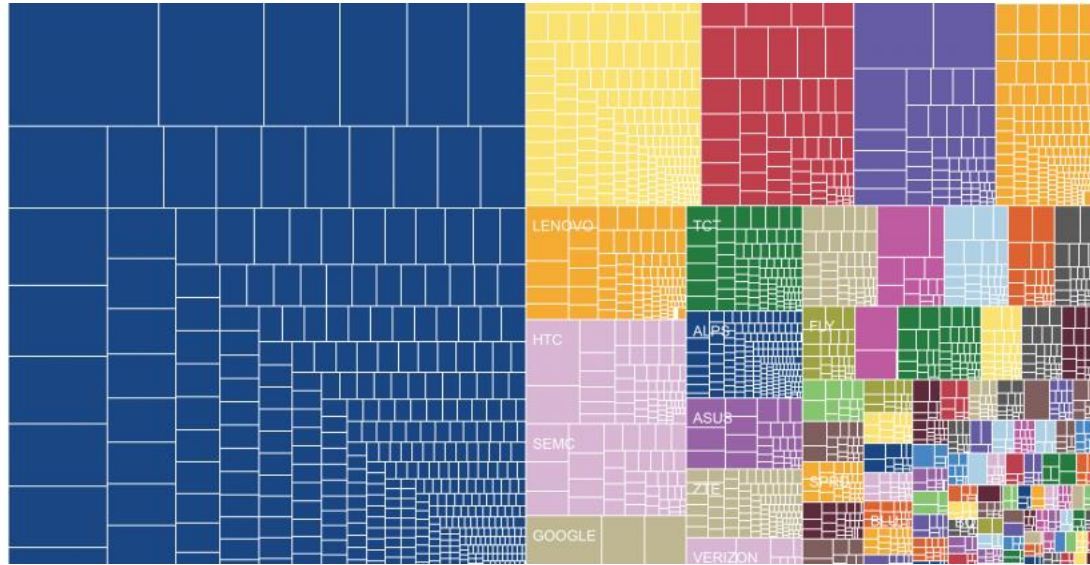
Summary

- Device selection
- Planning testing
- Performance
- Security
- Network/API
- Tools/Automation
- App Design

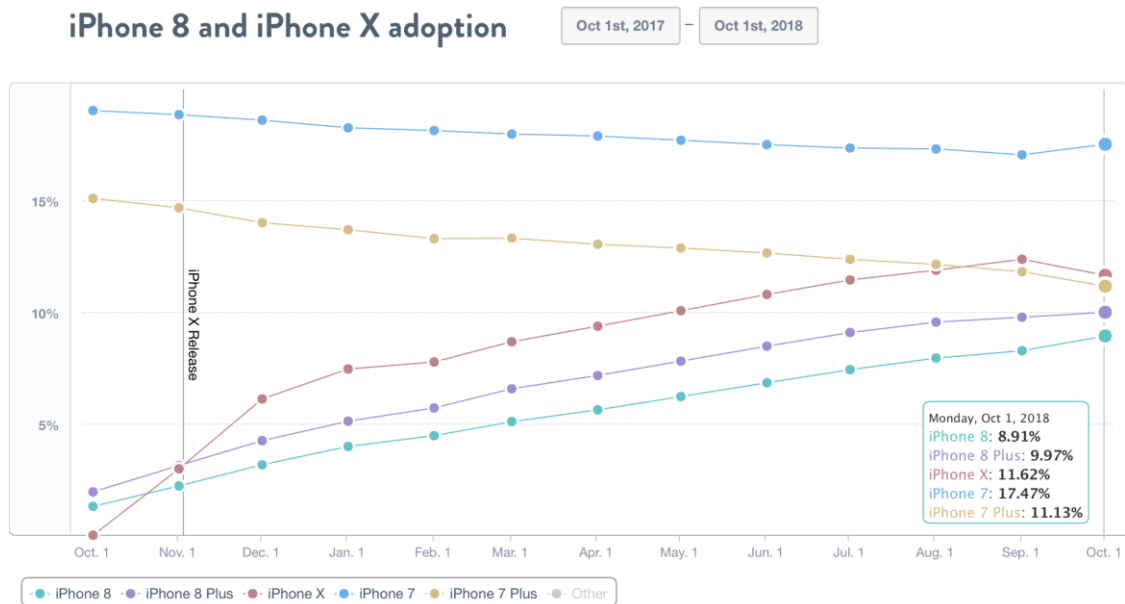
Device fragmentation



Device fragmentation



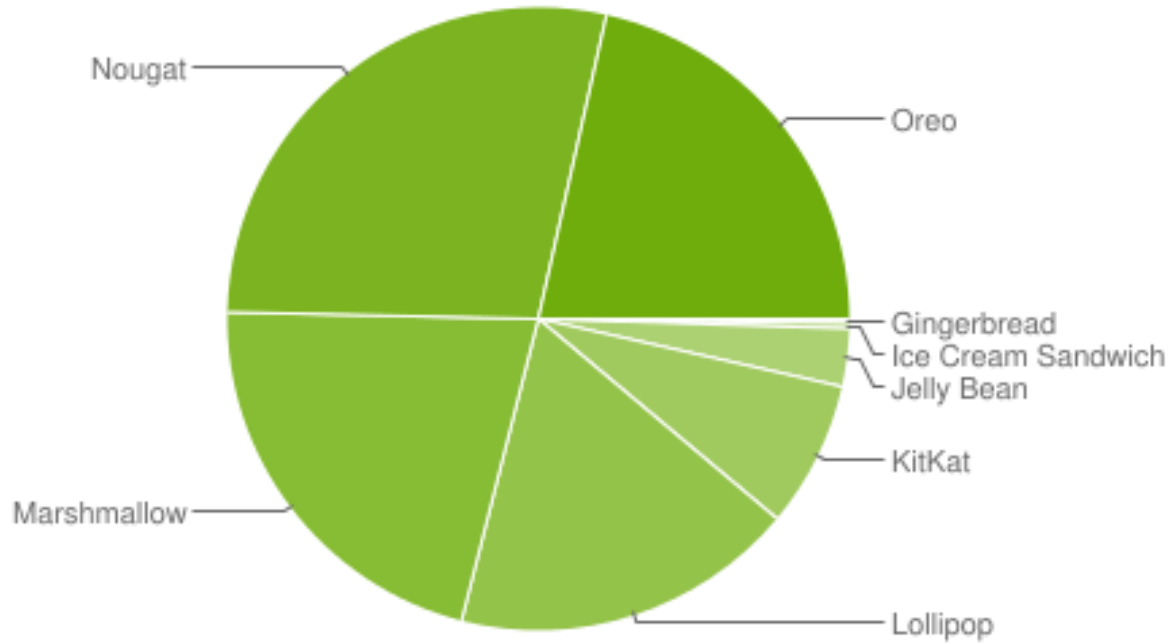
Device adoption



mixpanel

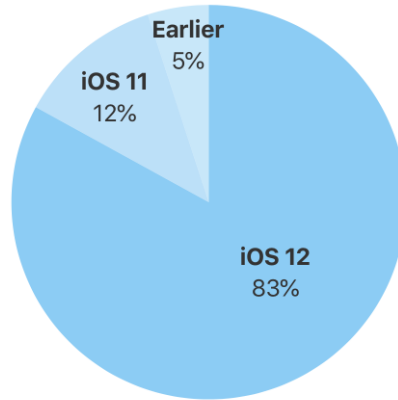
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OS fragmentation



OS fragmentation

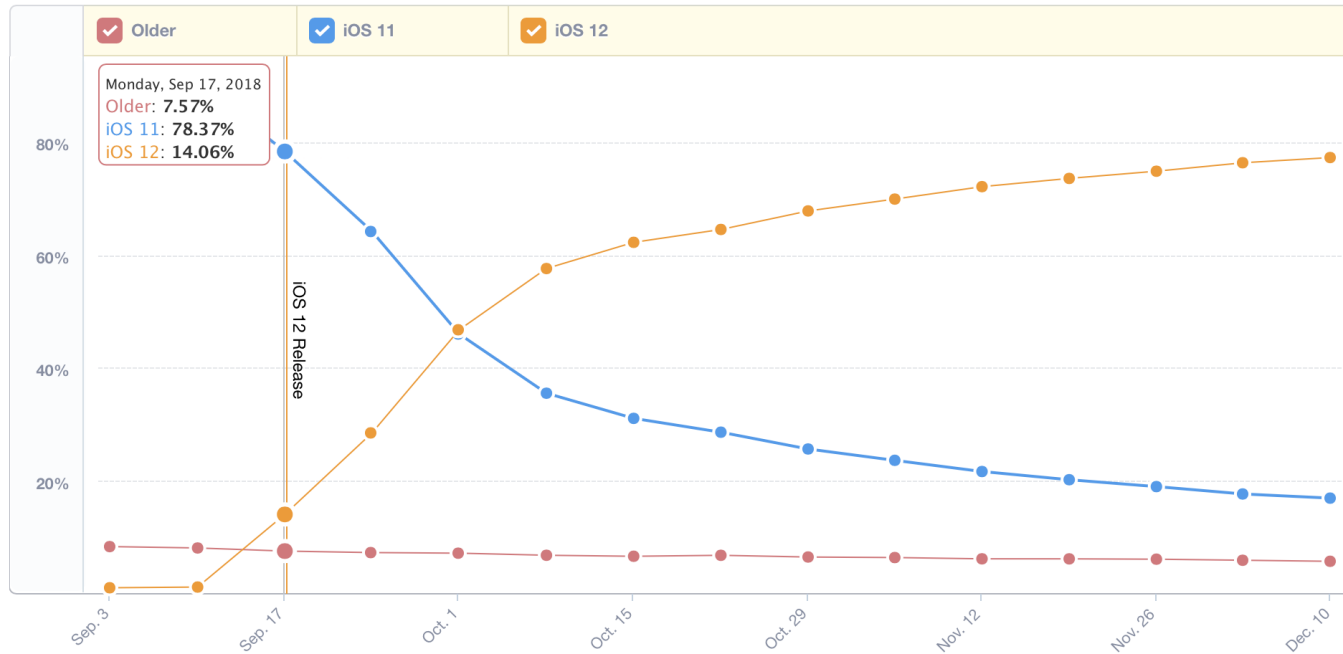
83% of all devices introduced in the last 4 years are using iOS 12.



As measured by the App Store on February 24, 2019.

iOS 12 adoption

Sep 3, 2018 - Dec 15, 2018



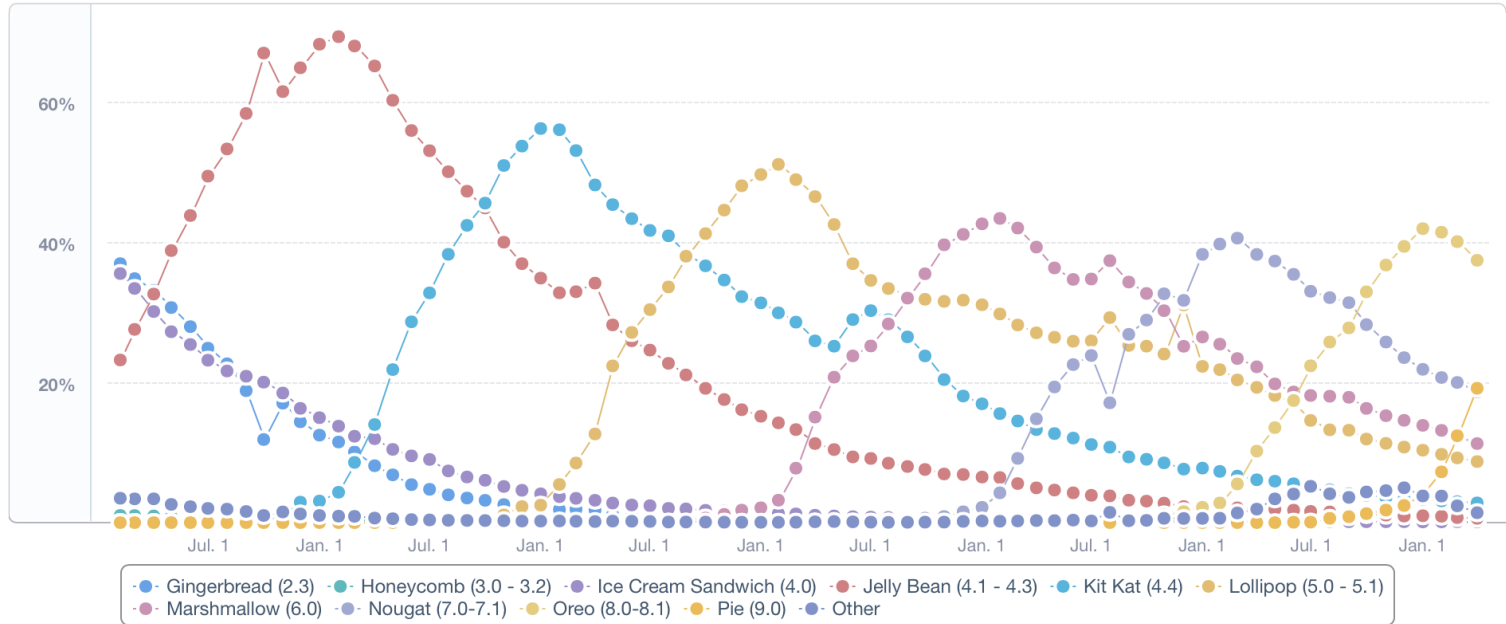
mixpanel

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Android OS adoption

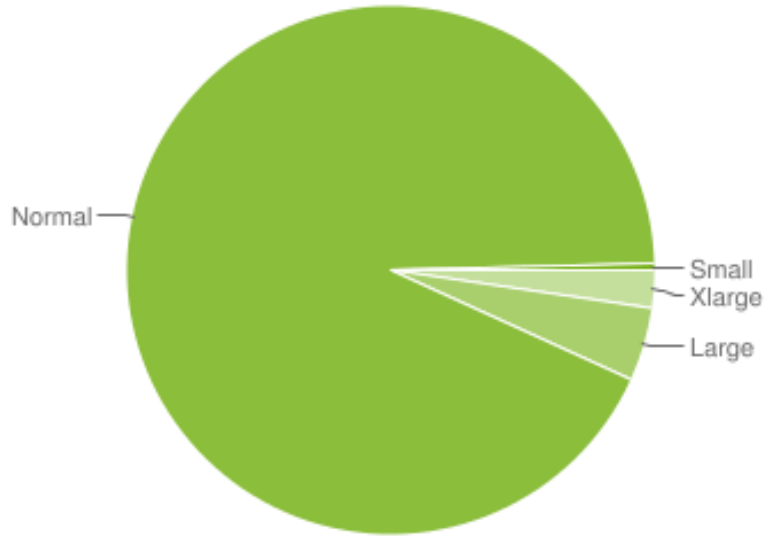
Feb 5th, 2013

Apr 29th, 2019

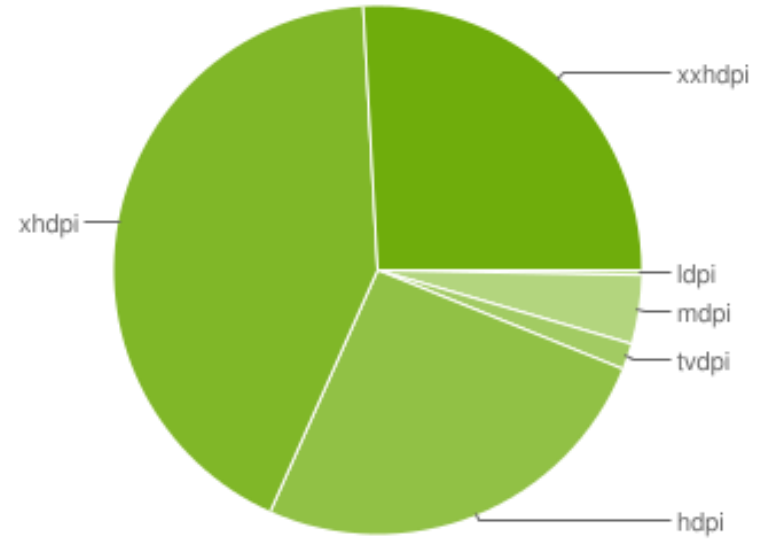


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Screen sizes



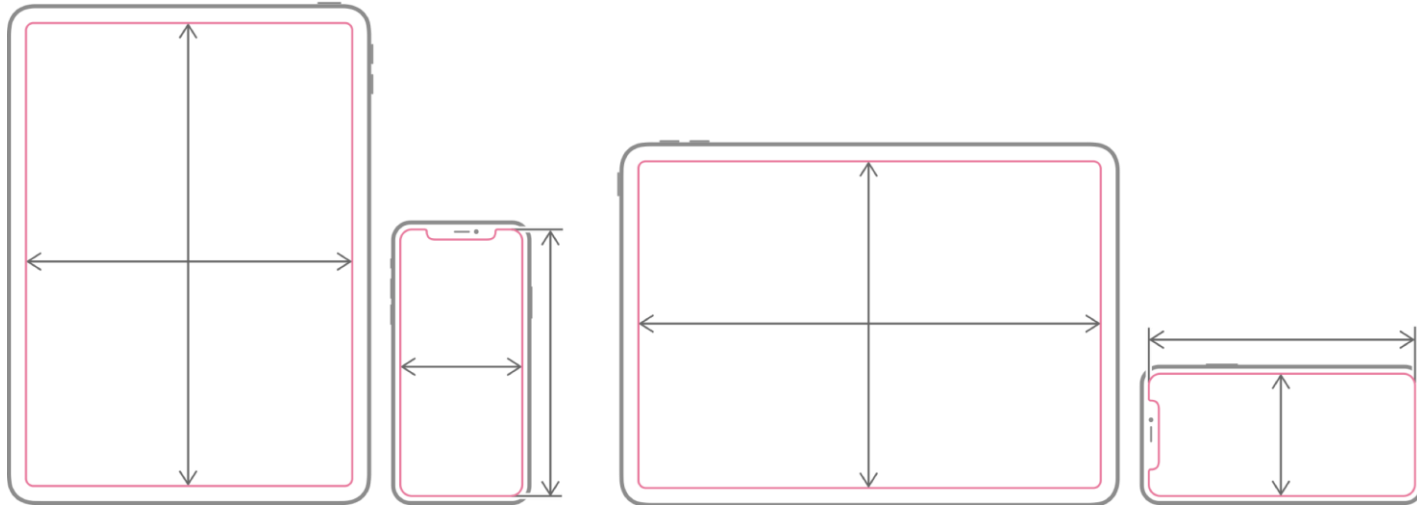
Resolutions



Screen size/resolution

	ldpi	mdpi	tvdpi	hdpi	xhdpi	xxhdpi	Total
Small	0.3%					0.1%	0.4%
Normal		0.7%	0.3%	24.7%	41.9%	25.2%	92.8%
Large		2.0%	1.3%	0.4%	0.3%	0.5%	4.5%
Xlarge		1.5%		0.5%	0.3%		2.3%
Total	0.3%	4.2%	1.6%	25.6%	42.5%	25.8%	

Device	Native Resolution (Pixels)	Native Scale factor
iPhone X	1125 x 2436	3.0
iPhone 8 Plus	1080 x 1920	2.608
iPhone 8	750 x 1334	2.0
iPhone 7 Plus	1080 x 1920	2.608
iPhone 6s Plus	1080 x 1920	2.608
iPhone 6 Plus	1080 x 1920	2.608
iPhone 7	750 x 1334	2.0
iPhone 6s	750 x 1334	2.0
iPhone 6	750 x 1334	2.0
iPhone SE	640 x 1136	2.0
iPad Pro 12.9-inch (2nd gen)	2048 x 2732	2.0
iPad Pro 10.5-inch	2224 x 1668	2.0
iPad Pro (12.9-inch)	2048 x 2732	2.0
iPad Pro (9.7-inch)	1536 x 2048	2.0
iPad Air 2	1536 x 2048	2.0
iPad Mini 4	1536 x 2048	2.0



- Regular width, regular height
- Compact width, compact height
- Regular width, compact height
- Compact width, regular height

Hardware

iPhone SE

- CPU 1.85 GHz dual-core 64-bit ARMv8-A "Twister"
- Memory 2 GB LPDDR4 RAM

iPhone XR

- CPU 2.49 GHz hexa-core 64-bit
- Memory 3 GB LPDDR4X

Samsung Galaxy J5

- CPU Quad-core 1.2 GHz Cortex-A53
- GPU Adreno 306 1.5GB LPDDR3 RAM

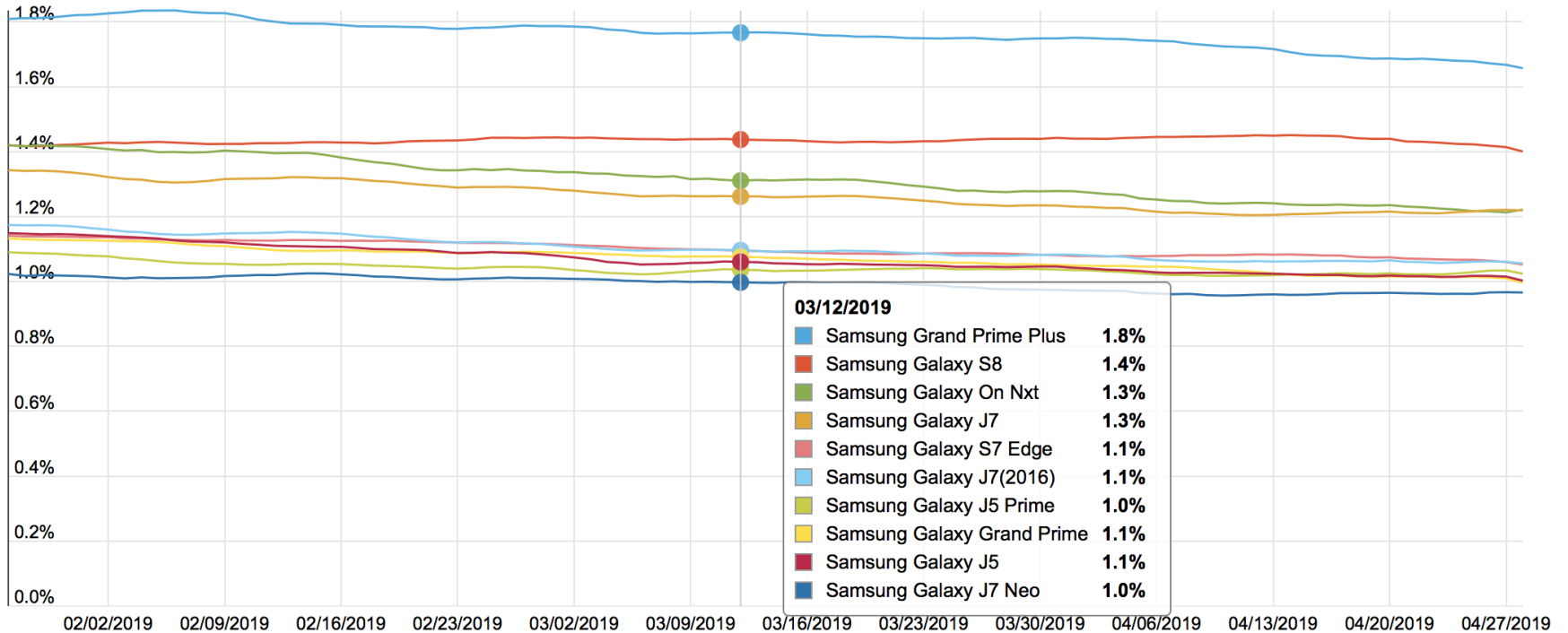
Huawei P30

- CPU Octa-core (2x 2.6 GHz Cortex A76, 2x 1.92 GHz Cortex A76, 4x 1.8 GHz Cortex A55)
- GPU Mali-G76 MP10
- Memory 6 or 8 GB LPDDR4X RAM

Demographics

- Location – North America, Worldwide
- Affluence
- Age
- Occupation

Usage data



Selection criteria

- Manufacturer
- Device popularity adoption rates
- OS versions and adoption rates
- Screen size and resolution
- Device performance
- User demographics

Planning testing

		Device 1	Device 2	Device 3	Device 4	Total
Functional	100	25	25	25	25	100
UI (device independent)	40	10	10	10	10	40
UI (device dependent)	40	40	40	40	40	160
Performance	20	20			20	40
Total						340

Reduction of 57%

Performance

- App vs API
- Network bandwidth and interruptions

Security - OWASP

- M1 - Improper Platform Usage
- M2 - Insecure Data Storage
- M3 - Insecure Communication
- M4 - Insecure Authentication
- M5 - Insufficient Cryptography
- M6 - Insecure Authorization
- M7 - Client Code Quality
- M8 - Code Tampering
- M9 - Reverse Engineering
- M10 - Extraneous Functionality

Network and API testing

- Expect interruptions to connectivity
- Test for API error handling
 - No network
 - Network good, but no server
 - Network and server good, but invalidly formatted response
 - Network and server good, response valid format, but missing content
- Test app with a range of content

Automation and tools

- Appium
- Native tools
- Cross-platform development frameworks
- Traffic monitoring

App Design

- Understand structure of UI design
- App store/Google Play acceptance
 - Example Google: *The app does not redefine the expected function of a system icon (such as the Back button).*
 - Example Apple: *Come up with your own ideas. Don't simply copy the latest popular app on the App Store, or make some minor changes to another app's name or UI and pass it off as your own.*
- Human interface guidelines

Design Principles

To maximize impact and reach, keep the following principles in mind as you imagine your app's identity.

Aesthetic Integrity

Aesthetic integrity represents how well an app's appearance and behavior integrate with its function. For example, an app that helps people perform a serious task can keep them focused by using subtle, unobtrusive graphics, standard controls, and predictable behaviors. On the other hand, an immersive app, such as a game, can deliver a captivating appearance that promises fun and excitement, while encouraging discovery.

Consistency

A consistent app implements familiar standards and paradigms by using system-provided interface elements, well-known icons, standard text styles, and uniform terminology. The app incorporates features and behaviors in ways people expect.

Thank you