

## Mobile App Testing Challenges?

According to analyst firm App Annie, the app economy will be worth \$6.3 trillion by 2021 — that's a 380% jump from the \$1.3 trillion app market of 2016. In order to account for this tremendous growth Quality Assurance (QA) departments must quickly scale experienced resources to meet demand.

In this fast-paced software development environment many unique QA challenges exist. Important factors beyond hardware and software to take into consideration for Mobile App testing include:

1. Device Variation - The biggest mobile app testing challenge.
2. Network Bypass - The Carrier network can have an enormous impact on the user experience with an app.
3. Tools Availability - Mobile app testing tools at our disposal are limited when compared to traditional testing.
4. Industry Standards - Mobile app testing must meet industry standards for an app to be globally accepted.

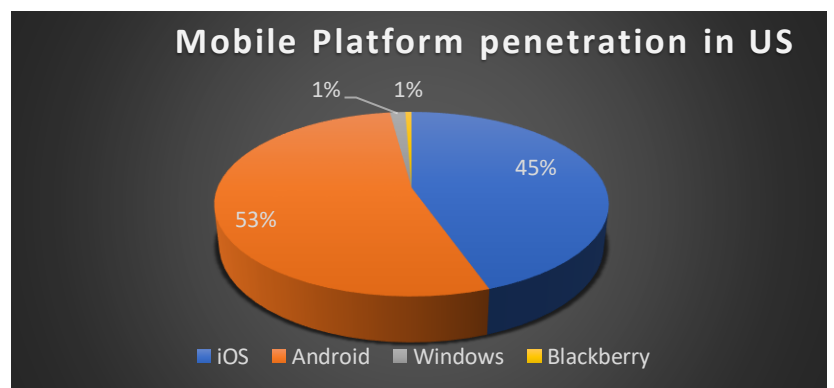
Device variation is the #1 mobile app testing challenge due primarily to compatibility issues, as a mobile app can be deployed across different operating systems (iOS, Android etc.), manufacturers (Apple, Samsung, Google, LG, HTC etc.), keypad types (virtual keypad, hard keypad) or the Display/Screen resolutions. Furthermore, QA cannot be 100% sure if a tested app working well with a given device will run smoothly on other devices.

### A Practical Approach

Experienced test engineers know it is impossible to cover every possible angle in Mobile App testing. It is not practical to expect to cover a universal combination of devices and OS versions, so it is best to target the most commonly used devices within the targeted demographic in order to derive the greatest value from your testing.

Using the USA demographic as a sample case, we have identified various categories:

- ✓ Smartphone operating system (OS)
- ✓ OS versions
- ✓ Screen Resolution
- ✓ Smartphone Vendors



The table below captures the market share in US for the iOS and Android Smartphones based on the OS Versions in use, Display Size/Screen Resolution and different Vendors:



iOS & Android Smartphones – Vendors, OS Versions & Models					
	iOS			Android	
OS Version	iOS 10	86%		Android K	18.80%
	iOS 9	11%		Android L	23.30%
	iOS 8 & earlier	3%		Android M	31.20%
				Android N	6.60%
				Older versions	20.10%
Display Size/Screen Resolution	5.5" Display (7 plus)	5.10%		1140*2560	17.20%
	5.5" Display (6 Plus)	15.00%		1080*1920	20.80%
	4.7" Display (7S)	7.50%		750*1334	26.80%
	4.7" Display (6S)	33.40%		720*1280	5.70%
	4.0" Display (5, 5S, 5C)	17.80%		640*1136	19.50%
Vendors				Samsung	53.10%
				LG	18.76%
				Motorola	8.07%
				HTC	4.13%
				Others	15.95%

Based on the above statistics, our test strategy is to create a matrix for the iOS and Android platforms with different OS Versions, Vendors and models.

In the case of iOS, the complexity is lower as compared to the Android. The table below shows the iOS devices and versions targeted for achieving sufficient test coverage for an iOS App to be released in USA demographic.

To Achieve Test Coverage of	iOS Version	iPhone devices to be targeted for Testing					# of Test Cycles
85% of iOS	iOS 10	7 Plus	6 Plus	7S	6S	5S	5
95% of iOS	iOS 10	7 Plus	6 Plus	7S	6S	5S	8
	iOS 9		6 Plus		6S	5S	

**Note:** The # of Test iterations is based on the type of target devices on which the App needs to be tested.

The below table shows the Android devices and versions targeted for achieving sufficient test coverage for an Android App to be released in USA demographic.

To Achieve Test Coverage of	Android Version	Android devices to be targeted for Testing						# of Test Cycles
70% of Android	Android K	Samsung S5						13
	Android L	Samsung S5	Samsung Note5					
	Android M	Samsung S5	Samsung Note5	Samsung S7	Google Nexus 6			
	Android N	Samsung S7	Samsung S6	Samsung S7Edge	LG K10	Google Nexus 7	Moto G5 Plus	

**Note:** The # of Test iterations is based on the type of target devices on which the App needs to be tested.

The above strategy enables a test team to provide predictable test coverage for the USA demographic. To increase test coverage you'd increase the number of Mobile Test Devices (from different vendors with different OS and OS versions),



which proportionality increases the number of testing cycles. If testing is done manually the schedule and cost will be a major challenge. In such a scenario, Test Automation becomes a necessity with maximum benefit derived from its inclusion as an integral aspect of the design process.

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