2012

How to Set the Right Strategy for Selecting Devices for Your Enterprise's Mobile Testing

INTRODUCTION

This white paper explains the implications of today's volatile and unpredictable mobile environment on your mobile ALM strategy as it relates to quality assurance. In particular, it suggests the main considerations and key criteria that enterprise IT leaders should take into account when determining the set of devices to use for mobile testing.

MARKET OVERVIEW

Mobile applications should be tested on all the operating systems (OS) defined by the product requirements (which today typically include at least three of the following: iOS, Blackberry, Android and Windows Phone). Each OS has multiple versions, vendors, form factors and other device characteristics. Android, for example, rolls out a major release every 6-9 months (Honeycomb, Ice Cream Sandwich, etc.), as depicted below.
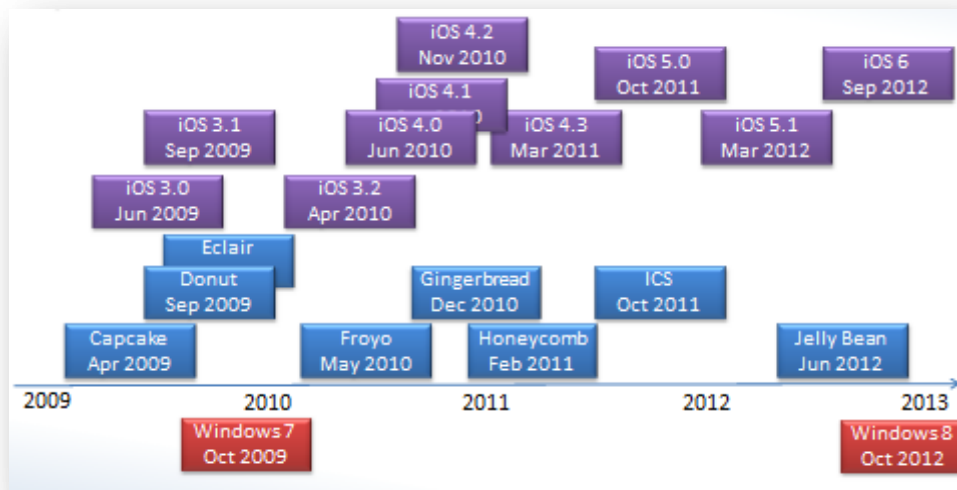

Figure 1: Significant Mobile OS releases since 2009

Let's take a look at Android to better understand the dynamic shifting within a particular OS market. In January 2011, Android version 2.2 led the Android mobile market with close to a 50% share. A few months later, Android 2.3.3 took its place on the leaderboard. By March 2012, Android 2.3.3 accounted for over half of the Android Mobile market. In August, Android 4.x (Ice Cream Sandwich) had already captured some 16% of the market.

This is only one example among the many competing platforms available in the market.

The graph below illustrates the usage trends growth rate of the top mobile operating systems worldwide. This graph clearly shows how the mobile market unexpectedly fluctuates with no defined leader or standards.
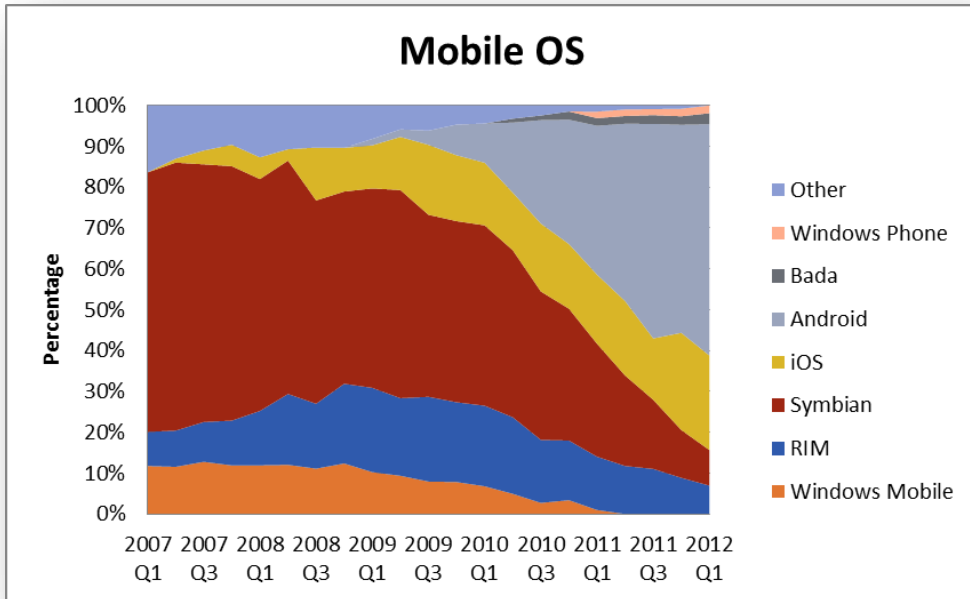
Mobile OS

Figure 1 : Top Mobile OSs Worldwide, IDC 2012

In addition to OS, there are other factors to consider such as screen sizes, resolutions, keyboards and so on. The chart below illustrates the distribution of screen sizes in the Android platform.
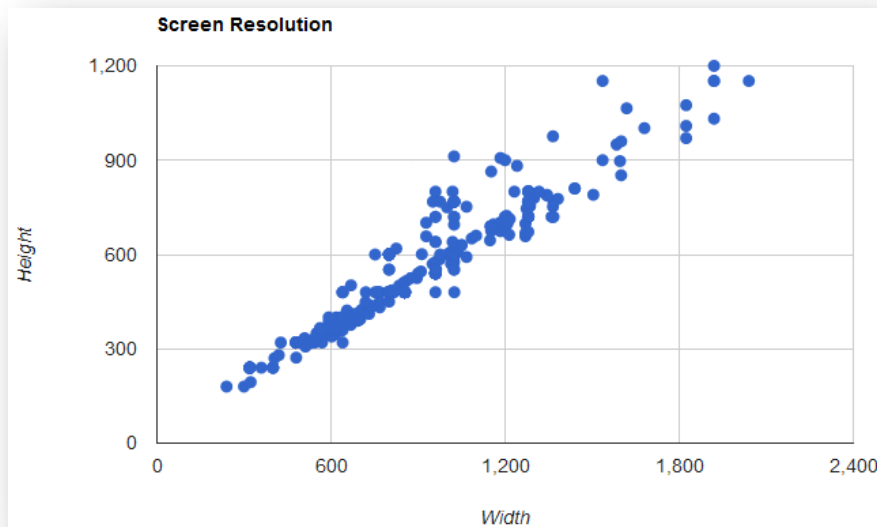

Figure 3: Distribution of Android devices by screen resolution, OpenSignalMap

So, given the multitude of choices and options, what's the best way to go about choosing the right set of mobile devices?

KEY CONSIDERATIONS – KNOW YOUR MARKET

Unlike desktop application development, in the mobile world it is critical to **think platforms**. With over 500 different mobile devices released to the market every year, it is critical to identify the relevant platforms and operating systems for your target market.

When choosing a set of devices for your mobile testing you will need to take these factors into account:

- What is your target market (age, geography, business/pleasure/youth, etc…)?
- What type of devices are supported : Smartphones, tablets or both?
- What are the top supported devices and manufacturers?
- Which versions of each major OS (i.e., iOS, Blackberry, Android) need to be supported?
- Which regions, carriers and network technologies are relevant?
- Which form factors and screen sizes are relevant?

Make sure that the most popular devices (smartphones and tablets) are covered – use exactly these devices rather than devices with similar combinations of manufacturer-OS, screen sizes, and resolution. In practice, different device manufacturers adapt the Android OS version to their own needs and apply their unique modifications. For example, a Sony Xperia acro S with Android V4.0 cannot substitute Samsung I9300 Galaxy S III with Android v4.0.4 for test coverage of Android v4.0. Not only do these models have a difference in the minor OS version, they are based on **different 'flavors' of the Android v4.0 OS by different manufacturers**. In the event that your target app users conform to the general market statistics, you can use industry analysts such as Nielsen to receive market share reports on a quarterly basis.

Additionally, based on internal priorities, your product team needs to deliver a list of platforms you need to support - this might vary from market to market. Decide upon the platforms on which you want to develop and, equally important, on what platforms you do not (define this as acceptable risk). In the long run, this decision will save your support staff a flood of calls from frustrated customers.

For **mobile websites and hybrid applications** utilizing web technology, excellent tools exist for analyzing your target market. Google Analytics breaks down site visits by device and OS so you know the exact makeup of your market and where to focus your QA efforts.

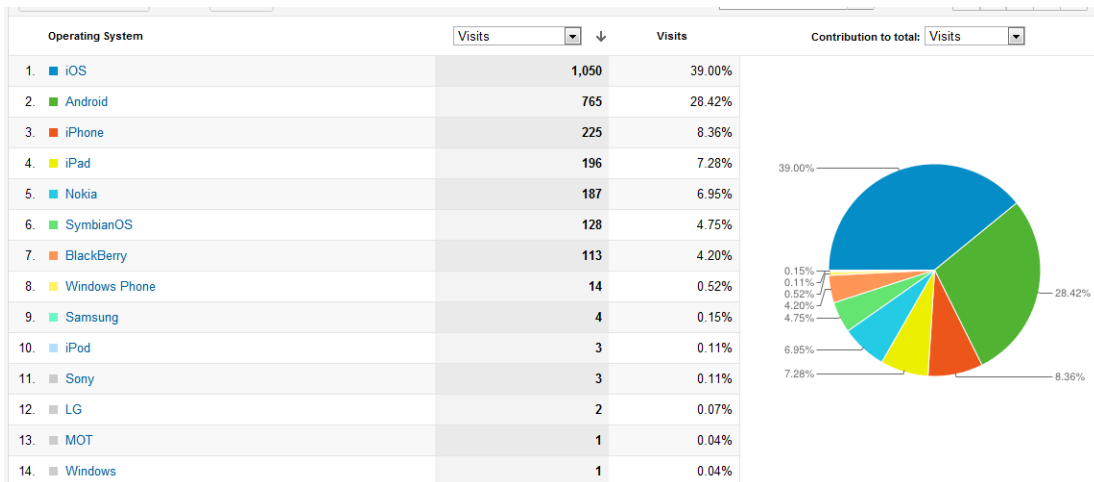|	Operating System	Visits ▾ ↓	Visits	Contribution to total: Visits
1.	■ iOS	1,050	39.00%	
2.	■ Android	765	28.42%	
3.	■ iPhone	225	8.36%	
4.	■ iPad	196	7.28%	
5.	■ Nokia	187	6.95%	
6.	■ SymbianOS	128	4.75%	
7.	■ BlackBerry	113	4.20%	
8.	■ Windows Phone	14	0.52%	
9.	■ Samsung	4	0.15%	
10.	■ iPod	3	0.11%	
11.	■ Sony	3	0.11%	
12.	■ LG	2	0.07%	
13.	■ MOT	1	0.04%	
14.	■ Windows	1	0.04%	

Figure 4: Example of Google Analytics Traffic Breakdown by Mobile OS

In addition, in such a dynamic market, it's important to anticipate emerging favorites ("flagship" devices). Many users will instantly adopt newly released mobile devices and OS versions, and connect right away to applications and websites, expecting a flawless experience. Since new flagship devices are typically launched every three months, by the time you launch your application such a device could already represent a substantial chunk of the market.

THE "MUST/MAJOR/MARKET" (MMM) MODEL

Once you've defined your target market, it's time to allocate the devices across the various testing stages in accordance with their importance and popularity. Based on our experience, we recommend using the "MMM" (Must, Major, Market) approach for this strategic task.

1. **"Must" devices for the development stage**. Identify between 6-8 of the **most popular devices** on which to run rigorous nightly sanity and regression testing. Revisit the selected platforms every quarter and replace 1-2 devices with newer ones to keep up with the market.

   While there is no substitute for testing on real devices, it is common to also use emulators during the development stage. The decisions of when and to what extent to use emulators or real devices are a function of your organization's risk management approach. In most cases, emulators (and a few reference devices) are used during early development, while real devices are used for most of the functional, regression and performance testing.
   Note: it is recommended to use real devices for sanity testing while still in the development phase to prevent your service delivery from accumulating a significant gap from the target market.

2. "**Major" devices for the QA stage**. To better represent the market, it is recommended to extend testing to cover approximately 12 "major" devices during the QA phase. The bulk of the functional and regression testing, including manual exploratory testing, is to be performed against these devices. Revisit the selected platforms quarter and replace 2-3 devices. While automation is critical in the Development and QA stages to shorten development cycles and accelerate time-to-market, checking UX attributes such as the "look & feel" of the application must be tested manually.

3. **"Market" devices for the production (porting) stage**. In order to reach market coverage of about 80%-90%, you should Select 30-40 devices. Most importantly, revisit this selection of devices each quarter and replace one-third of them with new devices to stay aligned with market trends. As a rule-of-thumb, 10 devices allows you to cover about 50% of your target market and 30 devices can cover about 80% of your target market.
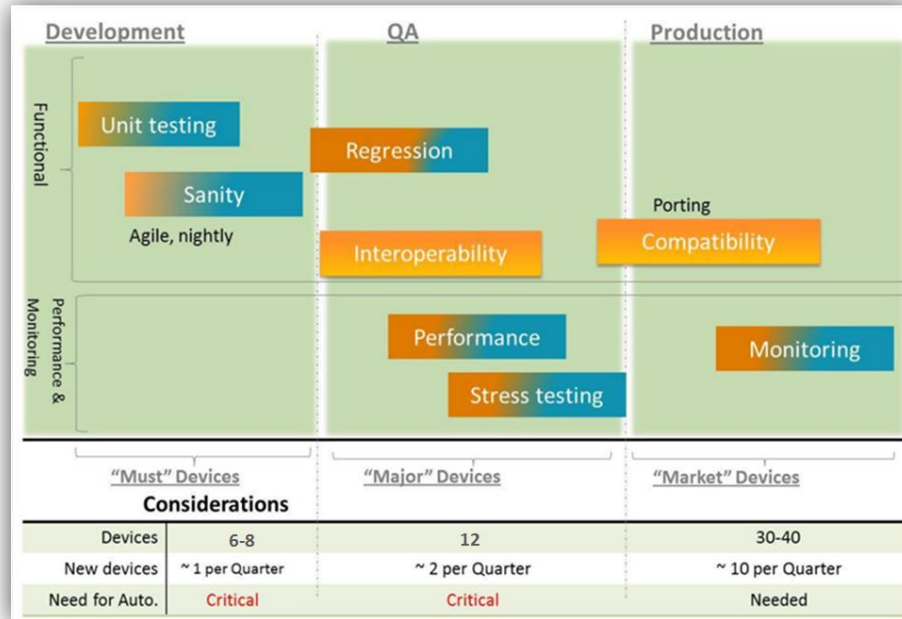

Figure 5: "Must", "Major" and "Market" devices used in different testing stages (simplified) - Source: Perfecto Mobile

CONCLUSION

Since your customers demand a flawless experience, you must test your mobile apps and websites on the actual devices that they are using - at least the most popular ones representing each OS. Anything else means increasing your risk and costs. The devices you choose should be based on the preferences of your target market, using available internal analytics as well as market research. In order to ensure a timely and cost-effective ALM cycle, it is important to correlate the number of devices with the relevant testing stages.

While there is no "one-size-fits-all" solution, we have outlined best practice guidelines for choosing the right mobile devices based on the "Must/Major/Market" model. Based on our experience in implementing enterprise mobility testing solutions, these guidelines are well-suited to the majority of enterprises dealing with the challenges of deploying mobile services.