

experience success

simplify experience | harness data | stay ahead | be efficient

Mobile Application Testing

Best Practices to Ensure Quality

Written by Assaf Ben David, Senior Software Testing Consultant

amdocs

embrace challenge **eXperience** success

Mobile Application Testing Complexities

The world of mobile applications has evolved to the point where it is now one of the basic levels of communication services, becoming essential to the everyday needs of the common mobile user. As the number of users grows exponentially, it is of utmost importance to ensure that mobile application requirements are met and that systems meet their purpose.

What makes mobile applications unique? Why is it not possible for standard test cases and running procedures to be employed to meet requirements?

Complexity is the key to understanding the challenges we face when we want to develop, or in my case to test, mobile applications. We have so many operational systems, and different manufacturers and models, so what should we test? How many devices should we cover? Twenty or one hundred? What are the trends and tools available in the market to solve these questions?

In order to develop a testing strategy for device applications, we should first understand what we want to test, or what the scope of testing is, as device testing includes a variety of testing streams:

a) Functional testing

These are traditional testing methods used to validate compliance of the application/web with the functional requirements and business needs.

b) Compatibility testing

This kind of testing assesses the application/web using a wide variety of browsers, operating systems, device types, device sizes, variations in connection speeds, changing technologies, and multiple standards and protocols.

c) Usability testing

Usability testing ensures that the end user's experience is efficient, effective and satisfactory for user application.

d) Performance testing

This type of testing assesses memory/CPU usage, battery consumption, and load on servers under various conditions. It determines what kind of performance is expected under such loads, and tests the speed of application response under different network conditions (Wi-Fi speed, 3G connection etc.)

“COMPLEXITY IS THE KEY TO UNDERSTANDING THE CHALLENGES WE FACE WHEN WE WANT TO DEVELOP, OR ITEST, MOBILE APPLICATIONS”

Once we identified the scope, and since there are numerous types of OS in the market, the next question we should ask is – what is the available coverage?

- Apple iOS
- Google Android
- Windows Mobile
- Rim BlackBerry OS
- Nokia Symbian
- Other

Each OS has multiple versions, sub versions and releases, requiring multiple testing to ensure a proper functionality of the application on all versions and sub versions.

The market comprises multiple device manufacturers and models and each manufacturer produces various models, sub models and screen sizes.

As the variety of hardware and software is so vast, there is a need to know how to combine the right mix of devices with the right mix of operating systems in order to build the best coverage.

Automation as a Solution

Automation is a solution that improves testing efficiency, which is even more important in mobile testing for the following reasons:

1. The virtually endless combination of devices, OS models, and device sizes mean that, in order to cover as much as possible, the same functionality needs to be run on different devices.
2. The industry is constantly changing, with OS updates, upgrades, new devices, and new manufacturers, etc. In order to ensure that your application is up-to-date and supported by new trends, you need the ability to test it fast.
3. Applications are regularly and rapidly updated with new features in order to keep up with demand. In order to introduce upgrades into the market quickly, fast testing capability using automation is crucial.

“THE VARIETY OF HARDWARE AND SOFTWARE IS SO VAST, THERE IS A NEED TO KNOW HOW TO COMBINE THE RIGHT MIX OF DEVICES WITH THE RIGHT MIX OF OPERATING SYSTEMS IN ORDER TO BUILD THE BEST COVERAGE”

The Solution

The following solutions are currently available in the industry and for each solution there are several top providers. I will not elaborate on the providers themselves, but will focus on the concept instead.

Simulator/emulator – tests the functionality of the software regardless of the device type and can test all OS and sub versions using automation or manual modes, without running the test on the device itself. This solution is most suitable during early development and testing stages as a prerequisite for testing the devices.

Remote connection – there are several types of software on the market that can operate the system using a USB connection to the device itself. Using this approach, you can build a remote lab using multiple PCs connected to devices and operate the devices from offshore using automation script or manual testers.

Cloud – real devices located in a remote lab. The benefit of this solution is that, instead of operating the system from an SW using USB, you are “really” clicking on the device itself and can see the device’s screen in real time. The device sits on a cradle connected to the server in the lab with a camera on top, recording the device’s screen. You can rent a specific device and operate it using manual or automation scripts.

So which method is best?

As always, it depends...

When starting a device application testing project, it is crucial to understand the potential coverage in terms of devices and OSs. Once the coverage is defined, the next step is to decide which would be the lead devices. Lead devices are not necessarily the most updated devices, but the most popular ones within the population which intends to use the tested application.

In early stages, and when moving from phase to phase during the testing life cycle, simulators/emulators are the best choice, using manual and automation scripts.

The next stage is to test the functionality of the utilities on the device itself. In order to cover more devices and OSs, the remote connection method can be used again with manual testing, but mostly with automation.

To complete the testing and make sure testing works properly on the device itself, I recommend using cloud testing for lead devices combined with manual testers testing real devices onshore.

This combination of testing methods assures better quality on the device application and the most appropriate combination should be decided according to budget constraints, and on a case-by-case basis.





embrace challenge e^xperience success

About Amdocs

Amdocs is the market leader in customer experience systems innovation. The company combines business and operational support systems, service delivery platforms, proven services, and deep industry expertise to enable service providers and their customers to do more in the connected world. Amdocs' offerings help service providers explore new business models, differentiate through personalized customer experiences, and streamline operations. A global company with revenue of \$3 billion in fiscal 2010, Amdocs has approximately 19,000 employees and serves customers in more than 60 countries worldwide. For more information, visit Amdocs at www.amdocs.com.

Amdocs has offices, development and support centers worldwide, including sites in:

THE AMERICAS:

BRAZIL
CANADA
COSTA RICA
MEXICO
UNITED STATES

ASIA PACIFIC:

AUSTRALIA
CHINA
INDIA
JAPAN
SINGAPORE
THAILAND
VIETNAM

EUROPE, MIDDLE EAST & AFRICA:

CYPRUS
CZECH REPUBLIC
FRANCE
GERMANY
HUNGARY
IRELAND
ISRAEL
ITALY
THE NETHERLANDS
POLAND
RUSSIA
SOUTH AFRICA
SPAIN
SWEDEN
TURKEY
UNITED KINGDOM

For the most up-to-date contact information for all Amdocs offices worldwide, please visit our website at www.amdocs.com/corporate.asp