Features of testing mobile applications

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Abstract

Today we are witnessing more and more enterprises leveraging mobility to improve efficiencies of business. Mobility provides consumers an access to more and more data at their disposal to make decisions. In an ever evolving mobile apps market, it's challenging to be successful as the users have a range of apps to choose from. Testing for mobile market is becoming challenging in an industry that's constantly changing. It brings forth some unique problems.

Keywords: Mobile Applications, testing mobile devices, testing strategy, device emulators, scripting

1 General

The goal of testing efforts is not to find errors, it should be to understand the quality of your app. Mobile app testing is time consuming and expensive presents unique challenges. There are trade-offs that you need to consider and choices, that you need to make regarding the mix of different techniques and methods that will be used in mobile app testing. Rather, you will need to consider a testing strategy that combines different testing options that as a whole, provide the best balance of trade-offs between cost, quality, and time-to-market.

Apps based on the three different mobile app architectures – Native, Web, and Hybrid – have different test case scenarios for each. They differ significantly in performance, stress, and compatibility testing. However, all types of apps are subject to other mobile testing challenges as well.

Native Applications commonly downloaded from an app store, is often controlled by the gate-keeping app store. They maximizes the capabilities of the device and operating systems for which they are developed.

A mobile web application, like the web itself, is viewable by users around the world.

When testing both native and mobile web applications, there are several challenges. Working out the right solutions requires an assessment of the advantages and disadvantages inherent to each of the available testing options and determining the technology that best suits your app testing requirements.

Testing needs to determine whether the app can be successfully:
- downloaded to the device;
- executed on the device;
- interact with the supporting back-end content infrastructure;
- when updates are made, need to be sure that the application can be pushed out to and accepted by the end user.

Native applications are inherently tied to the hardware and operating systems for which they are written. To meet the challenge of testing for native mobile applications:
- it is essential to test on the physical devices supported by your application;
- to ensure backward compatibility with each older and perspective generation of the device;
- to account for updates to the operating systems.

2 Testing mobile devices

Potentially tens of thousands of different client devices and wide range operating systems every day fancy the users who expect smooth running of mobile apps on any device anywhere. The mobile devices used by consumers create the most obvious challenge to mobile testing.

To handle the device challenge, you have three options:
- test exclusively using real devices;
- test exclusively with emulated devices;
- to use a combination of both.

Testing with real devices can be expensive and labour intensive.

Emulated devices are relatively easier to manage and cost effective. However, an emulated device is not sensitive to the ambient conditions that can impact the behaviour of the device.

A third approach is to select a mix of both emulation and real device testing. Emulated device testing early in the development cycle can help you achieve goals at a relatively low cost. The addition of real devices to your test plan later in the development cycle is helpful for validating that applications are functioning as expected, and certifying that all development requirements and objectives have been met.

Network. There are more than some hundred mobile network operators in the world.
- Each mobile operator may support multiple network technologies including LTE, CDMA, GSM and etc.
- Some mobile operators use less common or local networking standards such as iDEN, FOMA, and TD-SCDMA.
- Each network has a unique combination of network infrastructure that tunnels the packet-based protocols used by mobile networks into TCP-IP protocols used by the mobile web.
- Most network operators, implements a mobile web proxy, can restrict the flow of information that travels between your server and the test client.

Thus, the network challenge is quite complex.

The 15ᵗʰ INTERNATIONAL SCIENTIFIC CONFERENCE
INFORMATION TECHNOLOGIES AND MANAGEMENT 2017
April 27-28, 2017, ISMA University, Riga, Latvia

Jefremova I, Mrochko A

Scripting. The next challenge of mobile testing is scripting, which is the method of defining a test. Script execution can either be manual or automated.

Most real device automated testing software provides high-level scripting that operate on the text, image, or object layer. Most device emulators are capable of automating test execution using a higher-level, abstracted scripting language that is not device dependent. When you use automated scripting, the cost of setting up the script will typically be higher than the cost of a single manual execution of a test. But if it is a test script that you run on a periodic basis, you will eventually recover the costs of initial scripting. Many automated scripting tools have a special ability to scan a mobile website or application. This is a special capability, powerful, and cost-effective tool that can test an entire site with a single command.

There are trade-offs between coverage and efficiency during various development and test phases when applying test automation.

3 Conclusions

Choice of strategy for mobile application testing, is a matter of choosing a combination of testing tools and techniques to meet your quality requirements, because there are simply too many compromises that must be made.

After identifying bugs and functional problems using emulators, one can move to test with real devices, and remotely accessed devices. This way of testing in real-world conditions helps in identifying security and network impact.

There are trade-offs between coverage and efficiency during various development and test phases when applying test automation.

Network factor impacts the performance of a mobile app effecting user experience beyond hardware and software and it must be taken into consideration for testing Mobile Applications.

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