TESTING MOBILEAPPS

The Testing Strategies

Technology alone is not sufficient to guarantee commercial success of a MobileApp.

- Testing has two important goals:
  - to create test cases that uncover defects early in the development cycle
  - to verify the presence of important quality attributes.

The quality attributes for MobileApps are based on those set forth in ISO 9126 and encompass functionality, reliability, usability, effi ciency, maintainability, and portability

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testing strategy requires

- an understanding of both software testing and the challenges that make mobile devices and their network infrastructure unique
- knowledge of conventional software testing approaches
- understanding of telecommunications principles and an awareness of the differences and capabilities of mobile operating systems platforms.
- Knowledge of mobile handset testing, mobile website testing, the use of simulators, test automation tools, and remote data access services (RDA).

Are Conventional Approaches Applicable?

A comprehensive MobileApp testing program includes the generic spiral approach but will also include adaptations for client-server architectures, real-time computing, graphical user interfaces, WebApps, and object-oriented systems .

- MobileApp testing has unique challenges to ensure that an app meets both its functional and nonfunctional
- MobileApp testers adapt the strategy used for testing WebApps
- Content must be tested to be sure that it was chosen with the limitations of mobile devices and ad hoc networks in mind.
- Compatibility testing and deployment testing are more challenging in the mobile world, owing to the large variety in device characteristics and user environments.
- Performance testing needs to determine whether the limited storage, processing, connectivity, and power available on a mobile device may negatively impact features or functionality.

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- MobileApp performance testing is often conducted at a level of detail like in the development of real-time systems.
- Security testing has to take the loss of a physical device into account as well as exposing personal data to theft.
- MobileApps are often designed to be used by people with less technical knowledge so need for more extensive testing of the user experience , Agile development process models and/or test-driven development models can be used.

Testing Tools And Environments

What criteria use to select automation tools for mobile testing?

- *Object identification* —The tool can recognize device objects using a variety of methods (e.g., object ID, image processing, text recognition, HTML5/ DOM objects).
- *Security* —The tool should not require the use of an unprotected device connected to the public Internet.
- *Devices* —The tool makes use of actual user devices without requiring the use of special developer modes.
- *Functionality* —All device functionality is supported including multi touch gestures, virtual keyboard input, incoming calls and text messaging, alert processing, and others.

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- *Emulators and plug-ins* —The same test can be executed on different devices and different mobile operating systems using the existing testing environment.
- *Connectivity* —Simultaneous connection of multiple devices using USB, Wi-Fi, private cloud, and phone carrier to test connection stability and recovery.

Selected Tools for MobileApp Testing

Here is a list of several tools that might be useful in MobileApp testing. This is a very volatile field. This list of representative tools was recently recommended by Brown [Bro11] and Vinson [Vin11].[6]

Mobile Web page tools try to determine the degree to which a Web page is mobile device friendly. User enters a Web URL and the tool provides a list of defects.

Representative Tool

WC3mobileOKChecker **http://validator.w3.org/mobile/**)

Mobile browser emulators show the appearance of a Web page on mobile browsers. User enters a Web URL and tool shows how it would appear on a mobile browser.

Representative Tools

Mobile Phone Emulator **http://www.mobilephoneemulator.com/**)

iPhoney **http://www.marketcircle.com/iphoney/**)

Device emulators are virtual devices that typically run on a personal computer and allow you to develop and test MobileApps without access to physical devices.

Representative Tools

Android Emulators (**http://developer.android.com/sdk/index.html**)

iPad Peek (**http://ipadpeek.com/**)

Adobe Edge Inspect **http://html.adobe.com/edge/inspect/**)

Blackberry Simulators (**http://us.blackberry.com/sites/developers/resources/simulators.html**)

Automated tools record interactions on IOS or Android and allows their play back as test scripts. Typically these run on a personal computer with a device emulator.

Representative Tools

MonkeyTalk (**http://www.gorillalogic.com/testing-tools/monkeytalk**)

Eggplant Mobile (**http://www.testplant.com/**)

Device Anywhere (**http://www.keynotedeviceanywhere.com/**

Network monitoring tools add, modify, and filter HTTP request headers sent to Web servers. Installs as a browser plug-in.

Representative Tool

Modify headers (**https://addons.mozilla.org/en-us/firefox/addon/modify-headers/**)

Mobile analytics testing collects data to allow analysis of how users interact with the MobileApp which is important to assess ROI (return on investment). Typically requires a Web or cloud service to assist in data collection and storage.

Representative Tools

Flurry (**http://www.flurry.com/flurry-analytics.html**)

Google Mobile Analytics (**http://www.google.com/analytics/mobile/**)

Distimo Monitor (**http://monitor.distimo.com/**)

Exercises

- Explain Mobile testing strategy
- Explain criteria use to select automation tools for mobile testing ?