Testing Automation of Mobile Applications

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Outline

- Challenges
  - Generic Challenges
  - Technical Challenges

- Solution
  - Test Automation
  - How it works
  - Types of Automations
  - Benefits
  - Constraints
  - Selection Criteria

- Achieving Test Automation
Generic Challenges

- Device / platforms diversity
- Hardware complexity
- Application complexity
- Carrier network issues
- Compressed development schedules
Technical Challenges

- Large number of test cases
- API Level test execution
- Verification of UI control
- Handset specific features
Test Automation is the use of strategies, tools and artifacts that reduce the need of human involvement on repetitive testing tasks.

Supports – Unit, UI and Functional testing.
How Test Automation Works?

- Application specific test case writing
- Conversion of test cases into scripts
  (Write / Record)
- Execution of test Scripts on devices
- Unattended test cycles
Types of Testing Automation

- Unit Testing Automation
  - xUnit family of tools like JUnit/Bunit/OCUnit

- UI Testing Automation
  - VNC based tools that rely on image comparisons

- Functional Testing Automation
  <best approach>
  - Combination of unit test type scripts with instrumentations
Benefits

- Programmable
- Repeatable & Reusable
- Reliable & Comprehensive
- Increased productivity.
- Cost reduction
- Superior application quality.
Major Constraints

- Regression & Negative testing
- Testing device features used in app i.e. Camera, accelerometer, GPS & Bluetooth
- Call & SMS interrupts
- Voice-mail or IVR based scenario
- Network latency
Selection Criteria

- **Data Centric Apps**
  (e.g. SFA, CRM and Enterprise Apps)

- **Device Capability based Apps**
  (e.g. LBS, Camera, Multimedia, VOIP)

Mobile Automation Testing
Achieving Automation

- Open source testing tool – Selenium
- Our mobile testing automation library – MTA
- Record/Playback capabilities
- Push based execution on target device
- Assertions of test results on server side
Our Approach

**Testers Machine**
- Configuration
- Test Data
- Common Function Library

**Mobile Device**
- Mobile Test Application (build with MTA library)

**Flow**
- Record & Send
- Push for Execution
- Fetch Test Scripts
- Send Output Back

**Selenium**
- IDE
- Server
- (MTA) Desktop Client

**Result Report**
- Modify the Scripts
- Validate the Results
Benefits of our Approach

- Provides direct (key, value) pairs
- Better than screen comparison approach taken by other VNC based testing solutions.
- Test Scripts are independent of device resolution and screen sizes.
- Works on even low end single VM devices, as it runs in the same VM.
Case Study: M-CRM

- Mobile based CRM solution on J2me & Blackberry
- Manage customer list
- Create/send offers to the customers on SMS
- Track their responses
- Provide useful business promotion tips based on current trends
Case Study: M-CRM

- Only 40% code coverage by unit testing
- VNC based testing tools could automate 60% test cases
  - Problems due to many different screen sizes
  - Minor UI changes need re-recoding of test scripts
- Selenium/MTA approach helped automate almost 90% test cases
Questions
Thank you

For more information, write to us at mobile@impetus.com