Mobile Test Automation
Best practices for automating testing of mobile applications

WHITE PAPER

RealMobile™ PATENT PENDING
Mobile Automation – the Need and the Challenge

Mobile applications are ubiquitous. They touch all areas of our lives from business to personal: from CRM to social networking, from voice recognition to medical device management, and numerous other functions.

Unlike the personal computer world that is standardized around a couple of common operating system families and hardware configurations, mobile apps run on a variety of platforms. The most commonly known platforms: iPhone and iPad, BlackBerry and Android, Windows Mobile and Symbian, are just a few of the various alternatives.

This array of platforms is a serious challenge for software test automation. In order to perform adequate automated testing, we need a tool that can support multiple devices and their respective operating systems. This way we will not end up with the development and support costs of building tailored suites of scripts for each one.

Yet there is more to it. The CPU and memory of mobile devices are weaker than the ones of PCs and Macs. We all know that running a decent test automation tool on a Dual Core CPU with 2GB RAM is enough of a challenge. So, think about a typical iPhone with much humbler resources.

Test automation is a must for any mobile developer that wants to maintain high quality while keeping the budget within reason. In downloadable apps and mobile websites, the competition is just a click away. For enterprise applications deployed on thousands of devices, defect costs can be tremendous. Crucial business functions like ordering, route planning, and warehouse management rely on mobile devices. Deploying patches here is much harder and more expensive than fixing a web page. As a result, conducting thorough regression tests after making changes is of ultimate importance. Doing these tests manually is not as reliable as needed, takes lots of time, and raises costs. Automation can augment all these issues.

The Problem with Mobile Test Automation

In order to be reliable, effective, and efficient, automated tests for mobile devices should meet the following criteria:

1. **Execute the test on the device, not on an emulator**

   For the test to be valid, the application-under-test should run on the device itself, not on an emulator. Testing it with the CPU and the memory of the device is essential. An emulator cannot provide a fully reliable simulation of these.

2. **Support multiple platforms**

   To be efficient and effective, test automation should not be limited to a specific platform or even to a number of platforms. New devices are still being released to the market, and the ability to support new platforms without re-developing the whole solution is a must.
3. Use common tools that run on a PC

The reality of the test automation market is that a very limited number of tools became a *de facto* standard. They have rich function libraries, well-known scripting languages, and – most important – a large cadre of test automation engineers who know them well. These tools are supported by large companies that have the resources necessary to maintain and improve them. As a result, introducing new tools that are specific to mobile devices is a bad idea – the support costs and risks just do not justify it. Moreover, many mobile tests involve other platforms as well. Just think about updating an order on a mobile device, validating it through the admin console that runs on Windows, and then tracking its status on the web front. Common tools can support this scenario, yet specialized ones cannot.

**Common Solutions**

The common solutions can be broadly categorized into two groups: emulators and specialized tools.

Using emulators is appealing, as you can do everything on the good old PC and it is quick and convenient. However, it is ultimately unreliable, for the aforementioned reasons.

Specialized tools utilize a number of methods to cope with the unique challenges of mobile technology. Some tools take the route of braving the scarce processing and memory resources and are installed on the devices. It is hard to believe that their footprint does not impact devices’ functioning: after all, they have to listen to and mimic API calls. Other tools use an approach of hard-wiring the device to simulate inputs. The reliability of this approach is questionable. After all, no user carries a hard-wired device in his or her pocket. Furthermore, it usually takes quite a bit of time for the tool vendor to analyze each and every new device coming to market – too much time to respond quickly enough. Even putting the reliability aside, both of these solutions share the common problem of specialized tools with little support and few people who know them well enough.

The issue with mobile test automation is similar to the Quality triangle, where you cannot have the time, the money, and the quality at the same time. Each and every one of the common solutions seems to surrender at least one of the challenges of mobile test automation. The ultimate solution would answer all the challenges.
Real Mobile Test Automation

Just like with the Quality triangle, a better method is the key to success. Conflair has developed a better method, RealMobile™, to answer the challenge of mobile test automation.

Our method –

- **Supports multiple platforms** – we cover iPhone and iPad, a variety of Android phones, BlackBerry, Windows Mobile devices, and other platforms. Since there is no principal limitation in regards to the platform, in principle we can handle any.

- **Tests applications on the device itself** – thus maintaining the reliability of the test. With that, our method does not require installation of a full-blown automation tool on the device or altering the hardware of the device in any way.

- **Uses common tools** running on the PC, e.g., QuickTest Professional. This way we can automate end-to-end business processes that involve, besides mobile platforms, also web, Windows, Unix, Mainframe, and Mac.

Our method is based on accessing applications remotely, which makes the automated script independent of the hardware platform, and thus enables us to run it on multiple devices. Of course, this requires expertise – and that is exactly what we provide. RealMobile™ is supported by libraries of reusable functions and other assets that can stand on their own and at the same time are flexible enough to become part of an existing automation framework. Moreover, RealMobile™ allows automating not only traditional functionality but also barcode scanning, remote deposit capture (RDC), and much more.

Since its first implementation in 2009, RealMobile™ has been a continuous success. Leaders in retail, banking, and media are enjoying the benefits of our method. Since one picture can compete with a thousand words, our YouTube video would be a good start to learning about our method:

http://www.youtube.com/watch?v=vkpBUZpKz68
About Conflair

Conflair is a professional software quality assurance and testing company. We help our clients with both process and product quality by providing a variety of services:

- Test planning, design, execution, and reporting.
- Process improvement – designing and improving software development life cycle, documenting processes, implementing test management tools.
- Implementation assurance – helping companies to implement enterprise software solutions, e.g., ERP and CRM systems.
- Off-shoring assurance – helping clients to establish highly effective and efficient off-shore operations.
- Logo certification testing – making sure that your brand is protected by validating third party solutions that interface your systems.
- Training in a variety of areas in QA and testing, manual and automated – on-site in your facilities or in ours, as well as remotely over the web.
- Test automation for a variety of platforms, from Windows, web, mainframe, and Mac to iPhone/iPad, Android, BlackBerry, Windows Mobile, etc.

Fortune 100 companies to innovative startups, Conflair has assisted a variety of clients in several industries: financial and medical, retail and government, internet and telecommunications, just to name a few. Our solutions and services are tailored to fit the needs of each individual client.

For additional information please visit our website: [http://www.conflair.com](http://www.conflair.com)
or drop us an e-mail at [info@conflair.com](mailto:info@conflair.com)