International Journal of Application or Innovation in Engineering & Management (IJAIEM)
Web Site: www.ijaiem.org Email: editor@ijaiem.org
Volume 4, Issue 1, January 2015 **ISSN 2319 - 4847**

Survey on Mobile Automation Testing Tools

Sarafarazahmad Momin

Department of Computer Engineering, P.I.C.T, Pune, India.

ABSTRACT

Mobiles are now using for computing rather than for just calling, Automation has become the integral part of software development speedy life cycle. Manual testing is time consuming and tricky for complex application. This paper enlighten on some mobile automation testing tools and current trends in mobile automation on different types of mobile apps, like native, web and hybrid apps. We emphasize on some open-source tools like Robotium, MonkeyTalk and Appium and elaborate their supports and limitations. Some tools have record and replay functionality, in which record test script at the time of user interactions and replay it. Scope of this paper is limited to iOS and Android devices, both share 95.7 percent of the world's smartphones in last quarter of 2014. This paper has also done comparison between Mobile automation and Desktop automation testing.

Keywords: mobile automation tools, iOS, Android, Appium.

1.INTRODUCTION

According to IDC, "Android captures 78.1 percent and iOS 17.6 percent global smartphone market share in last quarter of 2014"[10]. Now a days mobile phones is mostly used for computing purpose rather than just calling, and the demand of smartphone is increasing exponentially, Due to internet and smartphone devices all desktop web apps are now building for mobile devices. Basically, there are three types of Mobiles apps native apps, hybrid apps and web apps. Native apps are standalone apps installed on device and have specific icon to start e.g. Games. While hybrid apps also installed on device but it needs internet to use it e.g. Facebook, WhatsApp. Web apps are deployed on some servers and we access those by browser.

1.1. Why Automation?

Now all desktop web apps are building for mobile too, so the speed of software development is increased while life cycle is reduced. Developer cannot go forward until the required functionality meets to user requirement, so the burden on testing team is little bit increased. It's not possible to rely on manual testing to achieve development speed. So we need to go for Automation to achieve quality and productivity.

1.2. Desktop vs Mobile Test Automation?

Mobile web apps have some different specification than desktop web apps such as:

a) It has different platform like iOS, Android.

b) Each mobile has different resolution.

c) All mobile devices have complex user interaction like touch action events tap, swipe and scroll etc. Dependency on network and carriers means variation in internet access.

1.3Manual Testing and Automation Testing

The difference between the two categories by suggesting that automated software testing should be used to prevent new errors in the already tested working modules, while manual testing is better used for finding new and unexpected errors. The two approaches are complementary to each other, automated testing can perform a large number of test cases in little time, whereas manual testing uses the knowledge of the tester to target testing to the parts of the system that are assumed to be more error-prone.

2. LITERATURE SURVEY

2.1 Existing Tools

There are some automated mobile web testing tools such as MonkeyTalk, Robotium, and Appium etc. which has some pros and cons such as, MonkeyTalk provide support for iOS as well as Android devices. It has 3 components such as MonkeyTalk IDE, MonkeyTalk agent, MonkeyTalk scripts. MT IDE is built on top of eclipse which has functionality keys like Record/Replay and it communicate with MT browser and create testcase with the help of MT agent. MT agent trigger event when user perform any action on real device, and IDE add that command into script file. Robotium is Android automation tool, in which we have to write test script manually and then run on it. Generally, it is least used tool due to its specification. Appium is the most popular framework which automate mobile native, hybrid and web apps of android, iOS and firefoxOS devices. Appium is built on node.js open-source environment and uses selenium webdriver API's for running testcase on real device.

There are several advantages to using Appium to test mobile applications:

a) Appium does not require any modification to the source code of your application before running tests.

b) Since Appium uses the Selenium JSON Wire Protocol, you can write your tests in any language supported by Selenium.

c) Appium uses first-party automation frameworks from Apple and Google, so tests replicate user behavior very accurately.

With Appium on Sauce, your tests require no setup or virtualization, and can be scaled instantly.

2.2 Related Work

Here is some related work presented in papers

Table no. 1.

No.	Paper Name (Year)	Author Name (Publication)	Description
1	An Integrated Test Automation framework for testing on heterogeneous mobile platforms – 2011[1]	Hyungkeun Song, Seokmoon Ryoo, Jin Hyung Kin – IEEE(2011)	a) Used existing framework fonemonkey for iOS and Robotium for android and created framework on top of it (NTAF). b) Robotium does not has record option so emphasize on iOS to record. c) There are Issues in Robotium in test script formation.
2	A GUI Crawling-based technique for Android mobile application Testing – 2011[2]	Domenico Amalfitano, Anna Rita Fasolino, Portfirio Tramontana – IEEE(2011)	It is based on the concept of web crawling. All events in Android application crawled the next events from next application page. This technique can save lots of time for page loading and searching for event command from web source page.
3	Android Mobile Automation Framework -2014[3]	Pallavi Raut, Satyaveer Tomar – IJECS(2014)	This papers emphasizes on Native Android apps
4	Web-Based Automation Testing Framework – 2012[4]	Anuja Jain, Swarnalatha P, M R. Ghalib, S. Prabhu – IJCA(2012)	It is desktop web apps testing framework and limited to windows and linux machines. GUI-WAT record/replay test cases using Selenium webdriver API.
5	A Novel Approach of Automation Testing on Mobile Devices – 2012[7]	Leckraj Nagowah and Gayshree Sowamber – IEEE(2012)	a) MobTAF is the framework which does not require PC to be connected. b) Both Test data and Test result are stored on mobile itself.

3. COMPARATIVE STUDY

Comparison between some tools with respect to platforms and features

Table no. 2.

Tool Name	Android	iOS	Description
Robotium	Yes	No	It has record/replay functionality with limited features, limited to android.
MonkeyTalk	Yes	Yes	Focused on web apps only
Appium	Yes	Yes	It support native, hybrid and web apps

4. SUMMARY AND FUTURE SCOPE

According to IDC survey of iOS and android smartphone users share 96.7 percent of total smartphones platform in the world. As ever increasing number of users, this papers explain why there is need of mobile automation. It also compared desktop and mobile automation, with enlighten on the importance of automation testing over manual testing. This paper explained some mobile automation tools and their support and limitations with different approaches used in reference papers. As Record/Replay is the functionality which complete the automation tool with touch operation on apps, which lack in some tools. In future, there should be emphasized on such features to optimize the software development life cycle of mobile applications.

5. ACKNOWLEDGEMENT

I would like to express gratitude to my Project guide Dr. R. B. Ingle and Meenu Jaiswal (Software Manager SAS R&D India) for the useful comments, remarks and engagement through the learning process of this part of master thesis. Furthermore I would like to thank Ipsita Samantarai for introducing me to the topic as well for the support on the way. This research is sponsored by SAS R&D India and the contents of this paper belong to SAS R&D India.

REFERENCES

[1] Hyungkeun Song, Seokmoon Ryoo, Jin Hyung Kin, "An Integrated Test Automation framework for testing on heterogeneous mobile platforms" – IEEE (2011)
[2] Domenico Amalfitano, Anna Rita Fasolino, Portfirio Tramontana, "A GUI Crawling-based technique for Android mobile application Testing" – IEEE (2011)
[3] Pallavi Raut, Satyaveer Tomar, "Android Mobile Automation Framework" – IJECS (2014)
[4] Anuja Jain, Swarnalatha P, M R. Ghalib, S. Prabhu, "Web-Based Automation Testing Framework" – IJCA (2012)
[5] https://github.com/saucelabs/appium-tutorial – 2014
[6] http://appium.io/ - 2014
[7] Leckraj Nagowah and Gayshree Sowamber, "A Novel Approach of Automation Testing on Mobile Devices"– IEEE (2012)
[8] Gaurang Shah, Prayag Shah, and Rishikesh Muchhala, "Software Testing Automation using Appium" — IJCET (2014)
[9] Shiwangi Singh, Rucha Gadgil and Ayushi Chudgor, "Automated Testing of mobile applications using scripting Technique: A study on Appium" - IJCET (2014)
[10] http://www.idc.com/prodserv/smartphone-os-market-share.jsp - 2015
[11] http://docs.seleniumhq.org/ - 2014

AUTHOR

Sarafarazahamd Momin received the B.E. degree in Computer Engineering from D. Y. Patil College of Engineering, Akurdi, Pune in 2012 and he is currently pursuing M.E. Computer as PG Scholar in department of computer engineering, PICT, Pune. He is now doing internship in SAS Research and Development India, Pune. His research interest include Mobile Test Automation and cloud computing.