



# Open source Test Automation Tools for Mobile Applications – A Primer

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## Executive Summary

"Mobile is changing the way enterprises create software, but trends and best practices for developers are emerging, helping to calm the chaos. The same cannot be said for mobile testing — the variety of devices, operating systems, and front-end development technologies make quality appear to be completely TBE (the best ever) delivered to the market in much shorter time frames than dev shops are used to." - Forrester Report 2014

A number of test automation tools and frameworks have hit the market during the recent years for mobile applications testing. With every new device, platform or version, the market only continues to witness more of them. Given the criticality involved in testing mobile applications today, an important question is: What tools can the tester rely on in order to deliver high quality mobile applications?

This paper discusses the various parameters to be considered while choosing a test automation tool/framework for automation. The paper also compares some of the leading mobile test automation tools from the open source world.

## What tools can the tester rely on to deliver high quality mobile applications?

## Why test automation for mobile applications?

While we understand and agree that manual testing definitely has its own advantages, the main rationale behind choosing test automation for mobile applications is to handle regression testing across multiple devices and platforms. While users do not like to see broken apps, it is unfair to expect manual testers to cover every possible functional area of the application across the various devices and operating system platforms and make it bug free.

The reader might argue that, while functional testing is just one part of testing the application, the Performance, Installation, Usability and Certification testing are other areas to be tested on mobile devices for which test automation may not be feasible. The main objective of this paper is to discuss functional testing and hence our recommendation would be, to go with test automation.

## Open Source vs Proprietary Test Automation Tools

In recent days there are frequent changes in OS versions with new features or updates to the existing components. Considering this situation, the two very important questions that have to be addressed are:

- ➔ How are these frequent changes going to affect the test automation?
- ➔ What type of tools should be chosen for such kind of ongoing changes?

**Maintenance** Open source tools are maintained by a larger community compared to proprietary commercial tools which are owned and maintained by a single entity. Moreover, tool enhancements to proprietary commercial ones come with a price tag as well as a long wait time to fix the issue. The above scenarios are very well tackled by the open source community by being very proactive. With skilled developers who are available to anticipate, mitigate and contribute to the OS changes, open source automation tools are made available immediately to the end users. Thus cost and time are better managed and effectively used by open source tools.

**Enhancements** Another major scenario would be "new feature requests". Open source tools welcome new feature requests and make them readily available to everyone. Open source tools also provide the option to develop any new feature that could be shared with the tool community, reviewed and made available to all. Although new feature requests can be made in commercial tools too, it will be processed at a slower pace considering the tool owner's priority which may or may not fit within the timeframe that the end user may be looking for.

## Criteria for selecting an open-source tool

We have considered the following parameters in our analysis of tools.

**Support for multiple platforms** Selecting tools that complement multiple platforms for different devices whilst development time and costs are minimized. Today, the leading platforms are iOS and Android, hence it is imperative that we consider them with due weightage.

**Support for black box testing** Selecting tools that could perform the core functionalities of mobile applications as per business specifications. The tool should not only mirror the user experience but should also be agile in usage.

# Mobile automation tools available for iOS and Android:

**Root or Jailbreak requirement** Being in a highly competitive environment the tool should be able to support root or jailbreak requirement.

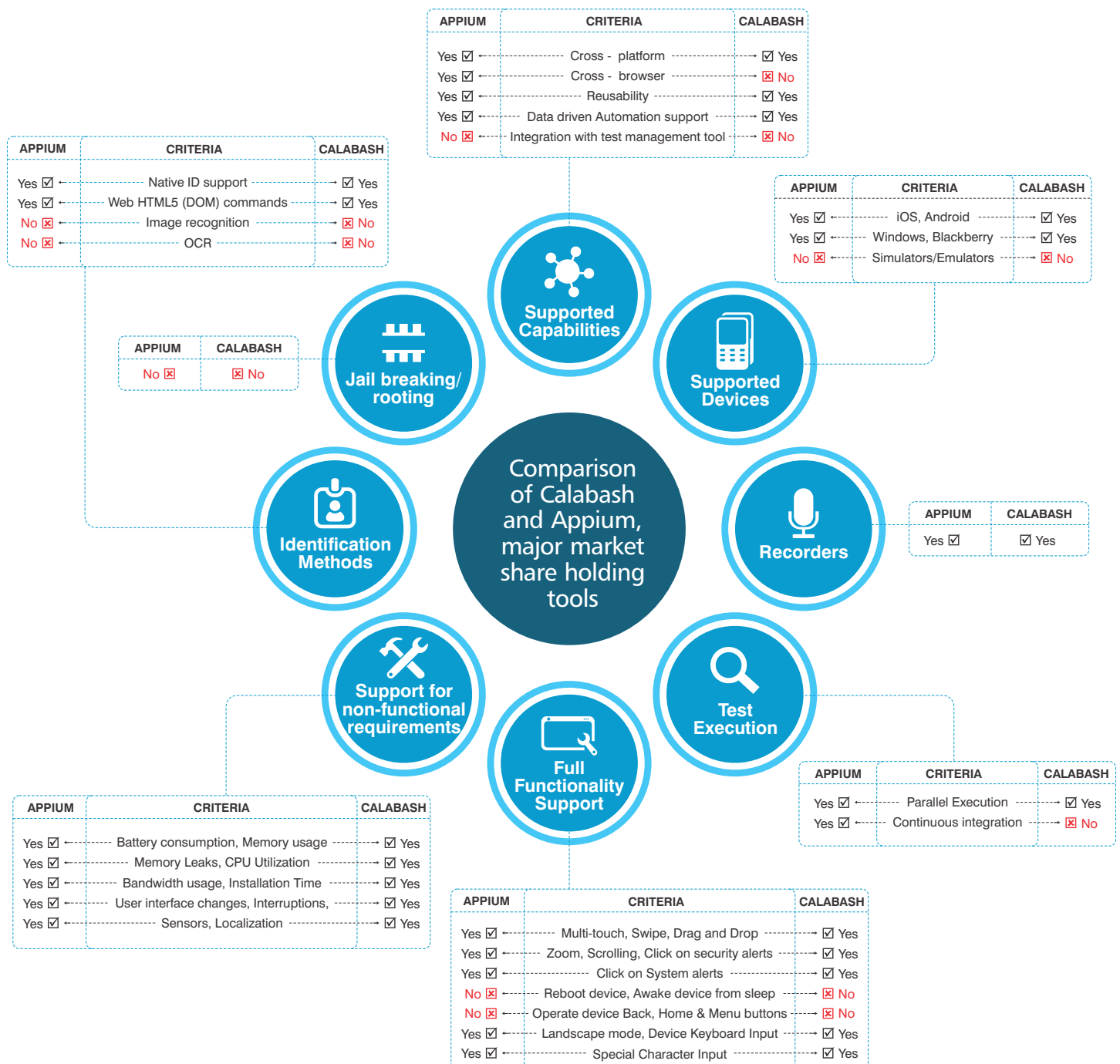
**Support for integration with CI/CD Tools** The tool should be compatible with CI servers which uses automated testing to implement quality control.

**Tools Evaluated** The list of mobile automation tools available for iOS and Android

iOS	Android
Calabash-iOS	Calabash-Android
Frank	MonkeyTalk
iOS-driver	Robotium
Appium	Appium

The market share is predominantly taken by Calabash and Appium.  
The picture below sums up the debate between the two based on different criteria.

## Comparison of tools based on various criteria



# In the fast-growing mobile environment it has become inevitable for businesses to adopt mobile technology to improve efficiency.

## Conclusion

In today's fast-growing mobile environment it has become inevitable for businesses to adopt mobile technology to improve efficiency. Though technical challenges have had an impact in production of mobile applications, the crucial challenge is to test whatever has been developed and ensure quality at all levels in the product being released in the market.

Despite obstacles in mobile testing, careful selection of tools that maximize the scope of automation and maximize the utilization of test scenarios could be a breakthrough. As maximizing automation is an effective way of expediting test processes, it is advisable to optimize it with an open source tool that could cater the business need.

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Stacks of open-source mobile automation tools available in the market assists test engineers to make an informed decision before the application being deployed on a platform or an environment and it checks the compliance with the device. A comprehensive approach on choosing the appropriate tool set with an extensive test coverage which could accommodate businesses is precisely how the vendors could optimize on open-source mobile automation tools.

## About the Authors

### Anil Kumar Sannareddy

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Anil has spent considerable time with Fortune 500 companies in implementing Test Automation solutions for both Web and Mobile environments and has huge experience in the DevOps environment. He has presented papers on Test Automation in various conferences across the globe.

### Murali Murugan

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Murali has experience with most of the industry leading tools like Test complete, Selenium, Web driver, Calabash and Appium. He has been associated with some of our top customers in identifying test automation solutions and integrating them with the DevOps environment. He is also a certified ethical hacker which complements his Testing background.



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