

# A Survey on Software Testing Tools for Mobile Applications

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**Abstract:** - The software testing is incomplete without some measure of quality assurance and software testing. This paper gives an overview on software testing, the types of testing, testing tools used in mobile applications and finally about few application using the testing tools. One such is the gaming applications which requires a wide range of testing levels. As these applications mainly concentrates on the collaboration, short iterations and frequent deliveries, software testing is an important process in fulling the integrity of such applications. The android testing tools such as Monkey testing and JUnit testing are discussed in this paper. Their impact on the software applications, how each tool had been taken over by the other tools, how they are also involved as a cause for the next generations of testing tools to come are also discussed.

**Keywords:** - Software testing, Mobile application, Testing Tool.

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## I. INTRODUCTION

Testing as described by the ANSI/IEEE 1059 standard is “testing is the process of analyzing a software item to detect the differences between existing and required conditions and to evaluate the features of the software item”. Testing the software is the best procedure for validation and verification of a software application or generally a program. The errors are to be identified in order to fix those errors. Software testing tries to meet all the requirements that a user needs. It is useful in finding out the possible errors in the application software. Software testing aims at bringing a complete success in the software that is been tested. Software testing certifies the quality of the product so that the user can avail it immediately. It generally decides the quality of the product. The main objective of software testing is the maintenance and delivery of a quality product to the customer. The main aim of software testing is to resolve the errors and flaws associated with the software application before the client finds them during usage of the application.

## II TYPES OF SOFTWARE TESTING

Testing can done in two ways:

1. Positive software testing
2. Negative software testing

Positive software testing is the process of testing by giving the known data to the application to know whether it reacts well with expected data. The negative software testing is the process of testing by giving data that is unexpected to know how the software works in such cases. Negative software testing is also known as illegal testing.

The two major approaches of software testing are

1. Manual software testing
2. Automated software testing.

Manual software testing-As the name says this process includes manual processing to check if the software program has any defects .In this the software tester acts as an end user and provides the data to check if the software has any errors.

Automated software testing-In this process the tester uses software application tools that helps in testing the programs. It consists of pre-scripted tests which are executed upon the programs so that they can be released for deployment.

## III TESTING TOOLS FOR MOBILE APPLICATIONS

Mobile Application Testing is the process of testing the functionality, consistency and usability of the applications designed and developed for mobile devices such as smartphones, tablet PCs or phones.

There are various tools that can be used for testing

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mobile applications. Certain tools are official like Junit, Monkey and some are third party tools which can be useful to test mobile applications.

Name	Features	Advantages	Disadvantages
Junit	<ul style="list-style-type: none"> <li>JUnit is an open source Unit Testing Framework for JAVA.</li> <li>It is very essential for Java Developers to program and execute recurring tests</li> </ul>	<ul style="list-style-type: none"> <li>The generation of test cases and test data is easy and quick.</li> <li>It has a ability to create a new test case and also it can reuse the older test cases.</li> </ul>	<ul style="list-style-type: none"> <li>It consumes more time while running the same set of tests over and over again for every OS</li> <li>The distributed tests is not possible. Thus, there is no way to run the same series of test cases simultaneously.</li> <li>Integration Test of small units is very limited.</li> </ul>
Monkey	<ul style="list-style-type: none"> <li>Monkey testing is a technique used in software <a href="#">testing</a> to test the application or product by providing random data and observing if the system or application crashes or gives an error.</li> </ul>	<ul style="list-style-type: none"> <li>Monkey testing can also be a good way to perform <a href="#">stress testing</a> and <a href="#">load testing</a></li> <li>It is very easy to execute because it just requires some random data to run against some random tests.</li> </ul>	<ul style="list-style-type: none"> <li>It consumes more time and also very difficult to analyse the unexpected issues</li> <li>The testers feel difficulty in specifying the test cases exactly and accuracy cannot be obtained easily.</li> <li>This testing does not have any predefined tests so it consumes more time.</li> </ul>
Kobiton	<ul style="list-style-type: none"> <li>It supports multi touch gestures, camera and speaker control, orientation and GPS simulation, device management and connection management</li> <li>This tool has the real cloud-based devices and configurations</li> </ul>	<ul style="list-style-type: none"> <li>It has an Internal Device Lab Management to utilizes the internal devices effectively.</li> <li>It has a simple user experience to streamline test sessions</li> </ul>	<ul style="list-style-type: none"> <li>It stores the testing history in a centralised manner. So, if multiple users request for the history at the same time, it takes some time to response.</li> </ul>
Robotium	<ul style="list-style-type: none"> <li>It is a free and User Interface testing tool for Android system.</li> </ul>	<ul style="list-style-type: none"> <li>The Robotium Tests are written in Java. So, It is platform independent.</li> <li>Robotium has a library for unit tests.</li> </ul>	<ul style="list-style-type: none"> <li>It is very time consuming for creating test.</li> <li>This Robotium tool is also not suitable for interaction with system software</li> <li>This tool cannot perform lock and unlock operations on a smartphone or a tablet.</li> </ul>
Calabash	<ul style="list-style-type: none"> <li>It is an automated acceptance testing framework.</li> <li>It also performs automated</li> </ul>	<ul style="list-style-type: none"> <li>It increases the productivity or throughput</li> <li>It has an improved</li> </ul>	<ul style="list-style-type: none"> <li>Proficiency</li> </ul>

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	functional testing on mobile native applications <ul style="list-style-type: none"> <li>• It supports libraries for both ios and android operating systems.</li> </ul>	quality <ul style="list-style-type: none"> <li>• It has an increased output consistency</li> <li>• It reduces the labor cost and expenses</li> </ul>	
<b>Clang Static Analyzer</b>	<ul style="list-style-type: none"> <li>• It is an open source tool</li> <li>• This tool has a collection of algorithms and techniques used to analyze source code in order to automatically find bugs</li> <li>• It is a source code analysis tool that detects the errors in programming languages like C, C++, and Objective-C.</li> <li>• The analyser is part of Clang, which consists of a set of reusable C++ libraries for building powerful source-level tools.</li> </ul>	<ul style="list-style-type: none"> <li>• It has a high quality of implementation</li> <li>• It is freely available and also extendible tool.</li> <li>• The static analysis engine used by this tool is a Clang library, which has the capability to be reused in different contexts and by different clients.</li> </ul>	<ul style="list-style-type: none"> <li>• The precision and scope of this tool is limited</li> <li>• Finding bugs using this tool is slower than compilation</li> <li>• Static analysis is not perfect since this tool can falsely detect the bugs in a program where the code may be correct.</li> </ul>
<b>Contrast security</b>	<ul style="list-style-type: none"> <li>• It undergoes over 2000 tests without generating any data breaching.</li> <li>• It is a product which instruments the applications with sensors to detect security vulnerabilities in your code and protect the applications against attacks.</li> <li>• Contrast security supports server-side mobile application testing.</li> </ul>	<ul style="list-style-type: none"> <li>• This tool supports the running application, which provides full analysis of the application logic.</li> <li>• This tool supports the mobile applications that leverage SOAP, REST, or HTML5 APIs</li> </ul>	<ul style="list-style-type: none"> <li>• Many of the most critical mobile application vulnerabilities are located in the server-side of these applications.</li> <li>• This tool does not support the Mobile application logic that runs on-device.</li> </ul>

### IV. APPLICATIONS

Gaming is one of the special application and it is also known as video games on a console like X-box, electronic games and play station or online gaming, which is carried in a personal computer. The first widely played video game is Pong. A game tester is an administrator who plays a major role in a game industry by using special tools. The tester focuses on the quality of the game and the Game testing companies mainly focus on compatibility, functionality and standard testing on all available consoles.

Professional video game tester is not required in beta testing services. Besides, a game tester is not just a game player. He has necessary skills and experience to track down errors, in order to provide game testing service. The more masterfully a game tester works with the tools of the profession, the more valuable employee he becomes.

### V. CONCLUSION

Software testing plays a major role in the software development process. This paper discusses about the introduction to software testing, various types of testing, testing tools used in mobile applications and also about few applications using the testing tools. Game testing

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application is a complex activity. Though it takes a lot of time and effort it becomes actionable through development. It is easily understandable and at the same time, it requires to be handled delicately to produce the exact product. At last a valuable product has to be reached to the end user.

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