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SOFTWARE TESTING TECHNIQUES

Alka Bamotra, Amanjot Kaur Randhawa

Assistant Professor Baring Union Christian College, Batala, District, Gurdaspur Punjab

Assistant Professor Baring Union Christian College, Batala, District, Gurdaspur Punjab

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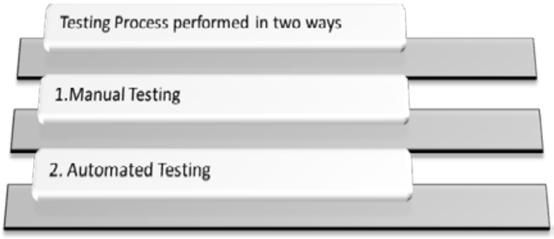
ABSTRACT

Software testing is an important stage of software process. In software development project, error can be injected at any stage during development. Testing provide different manner to reduce errors, cut maintenance and overall software .Testing is very expensive process. Testing process can be performed in two ways that are manual or automation. Manual testing is very time consuming as well as need lot of effort. In this paper we discuss different tools of automated testing and comparison between them. Most of the cost is occupied by the software testing process, it is very essential to implement the automation technique that reduces the cost that increases the software reliability. Automation testing tools help to increase the quality of the software.

Keywords: Software Testing, Automated tools, Manual testing.

1. INTRODUCTION

The testing of software is an important way of assessing the software to demonstrate its quality. Testing require 40 - 50% of development efforts, and consumes more effort for systems that require higher levels of reliability, it is a cogent part of the software engineering .The goal of the testing is to make sure that the software application under test become defect free. Software testing is a process is to identify all bugs that exist in a software product. It is the process of evaluating all the components of a system verifies that it satisfies specified requirements or to classify differences between expected and actual results. Software testing is also performed to achieving quality by using the software with applicable test cases. Testing can be integrated at various points in the development process depending upon the tools and methodology used.. Testing process can be performed by two ways that are manual or automation.



Manual testing is a process to test the software manually to find out the error. Manual testing is performed without using any automated tool. While performing the manual testing a test plan is used that describe the systematic and detailed approach of testing a software application .Manual testing carried out by the testers. Testers test the software manually for the defects. It requires a tester to play the role of an end user and use most of all features of the application to ensure its correct behavior. They follow a written test plan that leads them through a set of important test cases .The problems with manual testing are it is very time consuming process, not reusable has no scripting facility, great effort required, and some errors remain uncovered .Manual testing is not suitable for large projects as it requires more resources and time.

On the other hand automated testing is a process in which tools execute a pre defined scripted test on software to find error. Automated software testing is the finest way to increase the effectiveness and efficiency of software testing. Automation testing can does what manual testing does not. Automation testing also improves the accuracy and saves the time of the tester & organization’s money. It is best appropriate in the environment where the requirements are repeatedly changing & huge amount of regression testing is required to be

Corresponding author: Alka Bamotra |

performed. Software Thus, the goal of testing is systematically and stepwise detection of different classes of errors within a minimum amount of time and also with a much less amount of effort. Software testing is also an important component of software quality assurance (SQA).Automation testing covers all the problems of manual testing .Automation testing automates the steps of manual testing using automation tools such as Ranorex and Test Complete (TC) .It increases the test execution speed, more reliable, repeatable, programmable, comprehensive, and reusable.

2. SOFTWARE TESTING LIFECYCLE – PHASES

1. Requirements study

- Testing Cycle starts with the study of client's requirements.
- Understanding of the requirements is very essential for testing the product.

2. Test Case Design and Development

- Component Identification
- Test Specification Design
- Test Specification Review

3. Test Execution

- Code Review
- Test execution and evaluation
- Performance and simulation

4. Test Closure

- Test summary report
- Project De-brief
- Project Documentation

5. Test Process Analysis

- Analysis done on the reports and improving the application's performance by implementing new technology and additional features.

3. SOFTWARE TESTING AUTOMATION TOOLS

Various types of tools are used for automated testing and they can be used in different areas of testing. The selection of tool is based on the type of application which we want to test like automated web testing tools, GUI testing tools.

Ranorex is an economical and complete tool used for programmed testing. This is an improved substitute to conventional challenging tools for the reason that it tests applications from a user's perception, exhausting regular programming procedures and common languages such as C# and VB.net. It does not necessitate studying a scripting language, since it is written in pure .net code. We can use any one of the three languages, C#, VB.net and Iron Python. It is used by hundreds of initiative and commercial software companies everywhere. The recreation tools such as this can have comparable difficulties to the record and playback approaches, as the assessments are frequently resolutely friendly to the code, and both approaches still trust profoundly on expertise to generate the precise examinations to guarantee full consideration. Ranorex is centered on XPath, which is a very good technique to catch certain elements in a web based application. It is a pure .net API, which is very different from other tools which sit on an API. Future plans for this tool involve creating an open and documented interface for the users to write their own plug-ins, which provides the maximum of object acknowledgement for their own applications. Following are some of the features in the tool.

- Image-based detection
- Contains Ranorex Recorder for Record- Replay
- Provides unified incorporation for 32 and 64 bit operating systems
- Constructed on the .NET Framework
- Proposals a stretchy and standard test mechanization interface
- The test automation modules can be created as simple executable builds, with a standard .NET compiler.
- The Ranorex automation library (API) is built on .NET, consequently, letting you to incorporate it into current test surroundings and to association current automation jobs through Ranorex.
- Due to smart and easy to read automation code, the use of Ranorex repository, which separates GUI identification information from automation code.
- Offers the facility to do test automation in your own environment Uses standard and modern programming techniques

Rational Functional Tester (RFT)

IBM developed this product in 1999. It is an object-oriented programming based automated testing tool. It includes regression and functional testing tools which note down the results of black box tests in a well scripted format. Once captured, these scripts can be executed against future script builds of any application to verify thatnew functionalities have not disabled any previous functionality. With the help of this tool, black box tests can be run as well as white box tests for code bottlenecks, memory leaks or measuring code coverage. In 2006, IBM made a major transition to its software development platform to better help companies build complex software and applications. The Baltic or IBM Rational 7 was developed in 2006. Some of the advantages of this tool are:

- It enables regression testing
- It frees up Quality Assurance departments from maintaining and executing basic tests plan and cases,

and encourages the creation of additional, thorough tests

- It automates other on testing activities such as functional and test lab machine preparation.
- It reduces the probability of human error that can occur during activities such as test step execution and also test result recording
- It works with Web based, Java, and Microsoft Visual Studio, .NET, SAP, terminal-based, Siebel and Web 2.0 applications. This product also uses a Object Code Insertion (OCI) technology where no source code is used. This technology looks at the executable files in an application. These tools when built into the software, including Pure Coverage and Purify Quantify, perform white box testing on a third party code. Some of the advantages of these tools are:
- It provides memory leak detection and run-time error
- It records the exact amount of time an application spends in a given block of code for the purpose of finding all inefficient code bottlenecks
- It pinpoints areas of application that have been and have not been executed
- When performing regression tests on a product, if the application changes, like, images in different locations, tests will not fail because the product uses robust

Janova

This tool is much similar to others as it enables some users to automate software testing solutions and with the help of this tool it is done in a cloud too. This tool does not require any scripts to be written i.e. only simple English-based tools are used that simplify the task of software implementation with efficient and easy to use tools. Other advantage of this tool is that its cost is very less i.e. $10 per month. There is no such software to download and thus no infrastructural investment is required. Since it is used in the cloud, it has a very quick and easy setup that includes no install. This cloud based software has an easy navigation to home page.

TestComplete Test Complete is an automatic self-testing tool industrialized through Smart Bear; it makes available the testing of Windows and web applications and is one of the primary functional testing tools in the world. This is moreover confirmed by the fact that the tool has won the ATI Automation Honors award as the Best Commercial Automated Functional Testing Tool in 2010, and it is used in their projects by world's leading companies like Adobe, Corel, Falafel Software, ARUP Laboratories, Qlik Tech etc. The Test Complete tool uses a keyword-driven testing framework to perform functional tests; in addition, with it it is possible to also develop tests with scripts. Its operation concept is comparatively simple.

Selenium

Selenium is an open source web testing tool which is used to test the web browsers across different platforms. It is divided into four components: First is, Selenium IDE which is used as a prototyping tool and no programming language is required. Second Selenium Remote Control that allow users to use the programming language. Third Web Driver which implement a stable approach by direct communication between the test scripts and browsers. Forth, Selenium Grid that helps to execute parallel tests on different browsers by using with Selenium Remote Control.

Watir Watir is an open source tool for automating web browsers. This tool is simple and flexible in terms of easy to read and maintain. It supports only Internet Explorer, Firefox and Opera. It also supports multiple browsers on different platforms.

Windmill Windmill is a web testing framework that provides automation testing and debugging capabilities. The purpose of windmill is to create test writing portable and easier. It supports Firefox, Safari, Chrome and Opera browser. The tool runs on Microsoft Windows, Linux and Mac OS X. Without require any programming language Windmill provides a cross-browser test recorder that helps in writing tests.

Sahi Sahi is automation and testing tool for web applications. This tool is used by the developers for fixing and reproducing bugs, QAs for functional testing and by business analysts for defining and verifying functionality. It supports java script language and offers easily editable scripts

Quick Test Professional Quick Test Professional (QTP) helps the tester to perform an automated functional testing. It supports only window XP and developed only in VBScript or JavaScript. With QTP it is easy to edit the script, playback and validate the results

Tellurium: Tellurium is an open source automated testing framework for testing web applications. It was developed from Selenium framework with different testing concept. It is built with UI module concept which helps to write reusable and easily maintainable tests.

4. Comparison of testing tools

Table 1:

Criteria	Test Complete	Ranorex
Test Recording	Yes	Yes
Desktop application Testing	Yes	Yes
Data driven Testing	Yes	Yes
Test Result reports	Yes	Yes
Playback	Yes	Yes
Identifying the tested object	Yes	No
Plug- ins and extensions	Yes	No

Table 2:

Criteria	Ranorex	RFT	JANOVA
Install Required	Yes	Yes	No
Cloud	No	No	Yes
Knowledge of scripts required	No	No	No
Access to code required	No	Yes	No
User Friendly interface	Yes	Yes	Yes
Tutorial on How- to- use	Easy to follow	From Help/Getting Started there is link that is very useful	Not easy to find

5. LITERATURE SURVEY

The work done by various researchers for software testing techniques are discussed as following:
Pallavi Bhuarya et.al (2016) bring out the relevant issue of the mobile application testing and tools to remove them. [1]

V.Sathyavathy(2015) proposed real time application can be tested with automation and provides mutation testing that generates the faculty versions of original program.[2]

Rasneet kaur chauhan et.al(2014) proposed latest research and development in software testing i.e test driven testing, embedded software simulation test,GUI automation test,iterative and incremental testing.[3]

Neha Dubey et.al (2014) carry out a comparing and studying the concepts, builds and features of automated tools such as Ranorex and the automated QA testcomplete.[4]

Shivkumar Hasmukhrai Trivedi(2012) suggested different level of testing such as recovery testing ,loop testing, install testing, load testing, stress testing and sanity testing.[5]

Neha Bhateja(2015) proposed different automated testing tools as well as automated testing process .[6]

6. CONCLUSION

Quality is the main focus of any software engineering project. Without measuring, we cannot be sure of the level of quality in a software. So the methods of measuring the quality are software testing tools.This paper presents a study on various automated testing tools that used on different platforms.It takes time and effort and having a software testing goal to know which tool is the best to use given the type of software testing needs.Automation testing tools helps the tester to easily automate the testing process. Automation testing improves the accuracy and also save time of the tester as compared to the manual testing.The intention of this research is to carry out a comparing and studying the concepts, builds and features of automated tools

REFERENCES

1. Pallavi Bhuarya, Anuradha Chatterjee ,Shruti Nupur “Mobile Application Testing: Tools & Challenges” IJECS ,Vol 5 ,10 October 2016.

2. *V.Sathyavathy*,"Evaluation of Software Testing Techniques Using Artificial Neural Network "IJECS Vol.6 Issue 3, March 2017,ISSN 2319-7242.
3. Rasneet Kaur ChauhanȦ* and Iqbal SinghḂ"Latest Research and Development on Software Testing Techniques and Tools" INPRESSCO ,Vol 4(4) August2014.
4. Neha Dubey, Mrs. Savita Shiwani "Studying and Comparing Automated Testing Tools; Ranorex and TestComplete".Online publication in IJECS 5 May 2014.
5. Shivkumar Hasmukhrai Trivedi "Software Testing Techniques,ijarccsse,Vol.2,Issue10,October 2012.
6. Neha Bhateja ," A Study on Various SoftwareAutomationTestingTools",ijarcsse,Vol.5,issue6,june 2015
7. Richa Rattan, "Comparative Study Of Automation Testing Tools: Quick Test Professional & Selenium", Vsrd International Journal Of Computer Science & Information Technology, Vol. 3 No. 6 June 2013.
8. Keith Stobie, Too Darned Big To Test, ACM Digital Library, Queue – Quality Assurance, February 2005, Vol 3, Issue 1.
9. Khoshgoftaar TM, Allen EB, Hudepohl JP, Aud SJ.Application of neural networks to software uality modeling of a very large telecommunications system.
10. William White, Sifting through the Software Sandbox SCM meets QA, ACM Digital Library, Queue – Quality Assurance, February 2005, Vol 3, Issue 1.