

A Relative Analysis of Programmed Web Testing Tools

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Abstract - Testing is an essential step in the life cycle of software development and is very crucial in the success of an application and project. With the increase in the complexity of software project, time and effort required in testing also increases. Manual testing can handle only small projects therefore in order to increase success rate of a project one can use programmed web testing tools. A programmed testing tool does not need expertise of a user in testing. These tools facilitate software developers and testers to automate the complete progression of testing of functionality and performances of a software while saving time and costs. This analysis work delivers a complete analysis of available open source and profit-making programmed web testing tools. This analysis will help software testers and ordinary users to pick the suitable tool based on their requirements.

Key Words: Web testing tools, Manual testing, Programmed testing, Testing Excellence

INTRODUCTION

Software testing is a procedure of executing software or an application or a module with the intention of finding the errors within it. It the procedure of validating a product according to defined guidelines (commercial and technical requirements) and verifying it with respect to functionality [1]. There are two most basic types of testing white box and black box [2]: the white box testing focuses on the internal structure and logic of the project whereas the black box testing works on specified functions of the project. Other than the above two, there are a lots of testing techniques like, Unit testing, Component testing, Integration testing, Big Bang integration testing, Incremental testing, Component integration testing, System integration testing, System testing, Acceptance testing, Alpha testing, Beta testing, Software Test Types, Functional testing

Non-functional testing, Functionality testing, Reliability testing, Usability testing, Efficiency testing, maintainability testing, portability testing, baseline testing, compliance testing, documentation testing, endurance testing, load testing, performance testing, compatibility testing

Security testing, stress testing, and scalability testing etc [3].

All the above techniques can be performed manually or by using any automated/programmed web based testing tool. Manual testing is as ancient as computer programming. Anybody can test out a system, merely by using it. But a testing professional can investigate a product methodically and can

find bugs proficiently; and conversely, can offer good assurance that the system is ready to be released. Although manual testing is quite good to find bugs in a new code but the main obstruction is that this is slow and expensive to replay. Programmed (automated) tests are outstanding for all types of testing like regression testing verifies that no faults have grown since the last test but are not so decent for discovery of new bugs [4]. Additionally, there's a balance between the effort mandatory to automate a test and the costs of replaying it manually. Consequently, the manual testing is preferred when new features are added, and most developments will endure to accomplish at least some of their regression tests manually. Programmed testing tools are proficient of implementing tests, reporting conclusions and comparing outcomes with former test runs. Tests supported by these tools can be run recurrently, at any instance of time [5, 6]. Programmed testing is the use of specific software to control the execution of tests. A number of programmed testing tools are available in the market [7].

The main aim of this work is to bestow feasibility analysis of programmed web testing tools by comparing the characteristics of the tools which can help users to choose appropriate tool conferring to their requirements. The paper has been distributed into several sections. Section 1 gives introduction of testing. Section 2 gives a brief overview of related work. Section 3, gives brief overview of each testing tool. Section 4, gives parameters to decide the capability and performance of tools. Section 5 concludes the work and gives future aspects

1. RELATED WORK

There are several research works regarding programmed software testing modules [8-10]. Kaur et al. have conducted a comparative study among Test Complete, selenium and QTP tools [11]. Their work includes different aspects but does not elaborate the automation characteristics such as cross platform, record and play-back. Singh et al. have included cost and browser support features of the tools. Monier et al. have compared selenium- web driver, sahi watir-web driver, QTP Ranorex, Test Complete, Telerik, Coded UI on the basis of pricing, cross platform, Browsers support, Record playback, script language, ease of use, data driven framework, programming skills etc. Malik has given advantages and disadvantages of different web based testing tools [12].

2. PROGRAMMED WEB TESTING TOOLS

The testing tools can be categorized into the following categories:

- Performance, load and stress and testing tools
- GUI, Web Functional and or Regression testing Tools

2.1. Performance, load and stress and testing tools

2.1.1. Apache JMeter

The JMeter is primarily used for load testing and to studying and determining the performance of any system or application [13]. However it can be used to test performance of static and dynamic resources. It can be exhausted to simulate a full load on a server or in network to test its power or to examine complete performance under different load conditions.

2.1.2. WebLOAD

It combines functioning, scalability, and integrity as a sole process for the confirmation of web and mobile applications[14]. It can simulate hundreds of thousands of concurrent users making it possible to test large loads and report bottlenecks, constraints, and weak points within an application

2.1.3. LoadRunner

It is used for the web and other types of applications before application is finally delivered to the end user.

2.1.4. Wapt

It is an easy and inexpensive way to test websites, e.g.; business, mobile websites, online stores and web portals, It requires less disc space.

2.2. GUI, Web Functional and or Regression testing Tools

2.2.1. Selenium

Selenium is a set of diverse software tools every one with a dissimilar method to associate test automation [16]. It comprised of four basic components; Selenium IDE, Selenium RC, WebDriver and Selenium Grid. The IDE is Firefox add-on for record-and-playback web application tests whereas WebDriver openly connects with the web browser and uses its intuitive compatibility to automate. Its grid allows the Selenium RC solution to extend for huge test suites and for test suites that need to be run in multiple settings.

2.2.2. QTP

Quick Test Professional is a Windows based software testing tool which is used to test the applications on the web or desktop. It has been launched by Hewlett Packard . It is mainly functional and regression testing tool. It has an Integrated Development environment which comes with several functionalities.

2.2.3. Ranorex

It is a Windows based GUI testing tool. It is mainly used to test the desktop, web and mobile based applications. It can manage any kind of contemporary and lively GUI application, It is lanuched by Ranorex GmbH. It usually test the working of the application which includes develop and tester both. It leads to reliable testing and bugs can be find very quickly. It is very user friendly [18].

2.2.4. TimeShiftX

It is a date shifting tool. Using it you can travel in time software applications into the yet to come time or past. It has time shift testing features for all time sensitive workings such as leap year, year-end, etc. It uses virtual clocks to empower time travel inside of Kerberos and Active Directory, without manual system work. It does not need to change server location [19].

3. RELATIVE ANALYSIS





There are numerous open source and commercial testing tools available in the market. Some tools support windows while some support web and mobile applications. Although the main work is to test the several types of applications but these may differ in design, characteristics and way of working. We have picked up the most popular and usable testing tools and have compared them with respect to several evaluation parameters. First we have compared performance, load and stress testing tools (Apache JMeter , WebLoad, LoadRunner, Wapt). Then we have compared GUI, Web Functional and or Regression testing Tools (Selenium, QTP, Ranorex and TimeShiftX). For our relative analysis, we have selected the latest version of each tool and the trial version of profitable one. The tables further down have been created based on the characteristics required to differentiate between them. These features are important to compare one tool to another. The first criterion of testing tool is the cost for any tester or user and second is the user's requirements. The open source tools has the advantage in terms of cost but it may be of no use of the user. Moreover, it can be easy to maintain but may not be used on all platforms. It is also possible that the user is not aware of scripting and reports. Commercial tools often provide technical support which can be very useful for a native user. Moreover it can give full support free for some days and later under license agreement. If it is not liked by the user, user can change it.

The relative analysis offered here is in a tabular form which helps to gain comparison on easy basis. The analysis give the tester the foundation view of how to choose the appropriate tool based on user's requirement .The analysis facilitate the usability characteristics of each tool against every other tools and help the tester or developer to take a decision of how to make a selection. Table 1 illustrates the performance, load and stress testing relative analysis for different tools. Table 2 illustrates the relative analysis of GUI, Web Functional and Regression testing Tools.

Table -1: Performance, Load and stress testing

Tools Features	Apache JMeter	WebLoad	LoadRunner	Wapt
Icon				
Language	Java 6+	JavaScript	C	Ruby
Open Source	Yes	No	No	Free trial
Record and playback	Yes	yes	yes	yes
Platform	Linux, OSX, Windows, Mac,	Windows, Linux	Windows, MAC, linux	All windows,
Response format	HTML, JSON, XML and any textual format.	Excel	.irr files	Graphs and tables
Browsers	Firefox, Chrome, IE	All	All	Firefox, IE and chrome
Installation	Easy	Easy	Easy	Easy
GUI	Yes	yes	yes	yes
Extensible	High	yes	yes	yes
Multi protocol	yes	yes	yes	yes
Online support	yes	yes	yes	yes
Developer	Apache	RadView Software	Hewlett-Packard	WAPT

Table -2: GUI, Web Functional and or Regression testing Tools

Tools Features	Selenium	QTP	Ranorex	TimeShiftX
Icon				
Language	Java, csharp, python, ruby, php, perl	Java, JavaScript, VB Script	C#, VB.Net	Java
Open Source	Yes	No	No	Free trail
Record and playback	Yes	yes	yes	yes
Platform	Window, Linux, OS X	Windows	Windows (except XP)	Windows, Linux, AIX, Solaris, Red Hat, SUSE.
Response format	HTML	HTML	HTML	HTML
Browsers	Chrome, safari, IE, Firefox, opera, Android	IE, Firefox, Chrome	IE, Firefox, Chrome, Safari	All
Installation	Easy	Easy	Easy	Easy
GUI	yes	yes	yes	yes
Extensible	High	yes	High	yes
Multi protocol	yes	yes	yes	yes
Online support	yes	yes	yes	yes
Developer	SeleniumHQ	Hewlett Packard	Ranorex GmbH	vornexinc

4. CONCLUSIONS

Our research work encompasses of the relative analysis of several programmed web testing tools of mainly two types: performance, load, stress and GUI, Web Functional and regression testing tools. We have compared these two categories on the basis of several parameters. This analysis helps in choosing the appropriate tools according to user requirements. Tool selection depends upon multiple criteria. The work present each tools with characteristics which in the

same and different degree with respect to each other tools. This relative analysis helps to find out the browser support, cost, availability, platform support, language used, scalability, ease of installation and report formats.

Our future work will involve use of one of these tools to test a web application or a desktop application or a web project.

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