Review Paper on Comparison of Automation Testing Tools Selenium and QTP

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ABSTRACT

Software Testing Life Cycle is one of the most important phases of Software Development life Cycle. Effective way to perform Testing is Automation Testing that reduces the effort of manual testing. But it is important to select a best suitable testing tool according to the project requirement and financial Status. Main objective of the paper is to conduct a comparative study of automation framework like Selenium and QTP. Selenium is an automation tool which works with different browsers, operating systems, various programming languages etc. Whereas on the other hand QTP is losing its business because of its limitation such as it support only windows environment, limited cross browsing functionality and high licensing costs. The paper will provide the comparison of Selenium and QTP based frameworks on different criteria.

I. INTRODUCTION

Software testing plays an important and crucial role in Software Development Life Cycle (SDLC). Software testing is a process by which software are evaluated. The evaluation is done on various parameters.

Software Testing has different goals and objectives. The major objectives of Software testing are as follows:

• Finding bugs or defects which may introduce at the time of developing the software.

• To assess the quality of the software.

• To prevent defects.

• To verify that the software meets the requirements of user which were gathered in requirement analysis phase of software development life cycle (SDLC).

• To satisfy the customers by providing them a quality and valid product.

• To ensuring that a system is ready for use.

Also testing is classified in various categories. One of the broad categories of testing is manual testing and automation testing.

Manual Testing is done on Front-End. Here no coding is required. For example supposed you want to log in your Facebook account then first you have to go Facebook homepage where you entered your mail address then your password and then you have to click on log in button after this you have to wait until page loaded properly. Then you will click on your "profile" and then clicked on "about us". So it simply refers to the Manual Testing. You Verify that according to your request, corresponding page will be open or not…?? If not then bug is exist in our application.

In Automation Testing, it is done on Back-End, it means Testers design test cases According to the UI of the application and verify each and every element of web application.

The main purpose of running automated tests is to emulate the REAL world as close as possible to save TIME AND COST.

For Automation Testing, companies prefer "Automation Framework". The main motive of the tester is to find out all possible defects in the   software and report all defects to the developer to fix, so that software quality can be increase. Software Quality becomes necessary while we talks about customer satisfaction. It should be priority of a company to provide high level of customer satisfaction.

• Perform Manual Testing is very time consuming process, require more effort, not reusable because of no scripting facility and some error remain uncovered.

- Automation Testing overcome all the problems of manual testing with using automation framework like Selenium, QTP, Win runner etc.

Automation Testing is more convenient and efficient than manual testing. With automation testing we can save our time and resources too.

In Manual testing, Presence of tester are necessary to test application from every perspective, but in Automation Testing, Once you will completed the Design Phase of Test Cases and start execution of test cases on server then testers can concentrate on any other project and when you'll be comeback then you'll see the report in terms of passed and fail test cases.

There are two types of testing tools:

1. Open Source Testing Tool (Selenium Web driver).

2. Commercial Testing Tool (QTP, Win runner, QA Load, QA Test).

II. INTRODUCTION TO SELENIUM

Test Automation, also called Web Automation is growing in popularity because over the years company do not have time and money to invest in large test teams to ensure that application works as they are expected. Selenium is one of the most important frameworks in the testing field. Selenium originally created by "James Huggins" to solve the issue of getting the browser to do user interaction [2].

Selenium is basically used for Functional Testing of the web application. It can be used for testing in continues integration environment. This Open Source Framework released under the Apache 2.0 License and can be downloaded and used without any charges [1].

Selenium is an open source automation testing tool for automating web based applications. It can only use for perform automation testing of web based applications. It supports multiple browsers and multiple operating systems. Because of open source and supportive in nature, demand for Selenium is increasing day by day in industry [3].

Due to the following reason we may prefer Selenium for automation testing.

- Selenium Supports Multiple Browser, it means we can run our Test Script on different Browser.

- Free of Cost.

- Selenium Supports Multiple OS.

No other test tool covers such a wide array of platform.

There are some facts related to Selenium which a tester must know before using it and these are as follows:

- Firefox is a default browser of Selenium.

- Through Selenium we can't identify the image, only identify the path of image and the title of image.

- Selenium Web Driver is a tool for writing automated tests of websites. It aims to mimic the behavior of a real user, and as such interacts with the HTML of the application.

- Default Selenium Grid Port Number is localhost:\4444.

III. SELENIUM COMPONENTS

A. Selenium IDE

Selenium IDE is an integrated development environment for building Selenium test cases. Selenium IDE is Firefox plug-in that allows to testers to record their action as they follow the workflow that they need to test.

B. Selenium Remote Server (Selenium RC)

It is a Client Server Architecture that receives the Selenium Commands from the editor and test are carried out via browser.

For Ex: In Editor like eclipse , where we write our code and on the other hand we have website to test, In between these two, there is proxy server called RC, first our code go to RC Server From Editor (Eclipse) and then RC server interpret the selenium command and called particular function of web application.

Table 1: Difference between Selenium RC and Web Driver

Selenium RC	Selenium Web Driver
Selenium Server acts as a middleware between browser and Selenium commands.	Web driver talk directly to the browser. No Proxy Server present here.
Fewer Objects Oriented.	Purely Object Oriented.
Can't perform testing for Mobile Applications.	Can Perform Testing for Mobile Applications.
Slower Execution	Faster than Selenium RC.

C. Selenium Web Driver and Grid

Selenium Web Driver is the successor to Selenium RC, which directly talk to the browser by sending commands and retrieves the result.

Selenium Grid is a platform which is used for parallel execution of test cases on different machines and different browser at a time. During Working with Selenium Grid we need to ensure that we follow the certain protocols: Configuring Hub, Develop Automation Script, XML Build File, Test Execution, and Result Analysis. A brief difference between Selenium RC and Selenium web driver is shown in the Table 1.

IV. INTRODUCTION TO QTP

QTP is a commercial Tool introduced by HP. It performs regression and functional testing through a user interface of application. QTP supports web based application as well as window based application. We will use VBScript as programing language to develop automation Script. It was originally written by Mercury Interactive, which was acquired by HP (Hewlett Packard).

There are following advantages of using QTP:

- QTP supports VB Script to write automation script, which is quite simple.
- QTP Supports File Upload System but Selenium Don't.
- It's easy to identify object.

There are following limitations of using QTP:

- Commercial Tool. We have to pay for it.
- Can't Support Multithreading. We can't execute multiple test cases on different browser at a time.
- Execution Speed Slow as compared to Selenium.

V. COMPARISON BETWEEN SELENIUM AND QTP

When it comes to test automation tools for web application testing it is hard to choose between the available options in the market and the right alternative that offers best of the latest technologies from the market place at the right budget. Open source tools always encourage testers to select because of low initial investment but, they are not always the best alternative in due to lack of official support & training. On the other hand Commercial tools are expensive to implement but provides official support and training.[5]

Automation is a continuous process and have the following steps:

- Setting-up the test environment.
- Screening the available tool options.
- Creating a Proof of Concept with a few sample test scenarios for the application.
- Preparing (automation) frameworks.
- Building libraries of functions and methods.
- Defining configuration parameters.

The comparison between QTP and Selenium is shown in Table 2.

Table 2: Difference between Selenium and QTP

Parameter	Selenium	QTP
Cost	Open Source	Commercial Tool
Language Supports	Java, Python, Ruby, .net and C#	Supports Only VB-Script.
Application Support	Web Based Only	Window and Web Based Application.
File Upload System	Don't	Supports
Parallel Execution of Test Cases	Supports	Don't
Effort and Skill	User needs to have good knowledge about core java.	Requires Less effort to create a script.
Execution Speed	Fast as compared to QTP.	Slow as compared to selenium.

VI. CONCLUSION

Before going online, it becomes essential for organizations to test their web sites and web applications either manually or through automation tools. As manual is time taking so companies go for automation tools more. So an automated web testing should ensure that the web applications are performing their usual functionality or tasks for which these are intended. This paper would be of useful to anybody interested to become an Automation Test Engineer.

While evaluating different test automation tools the testing team should look out who will develop, maintain and support test cases. If the test team is considering ownership Selenium will be an advantage because Selenium is an open source tool hence more popular among testers.

QTP could fit your team, if you have money to spend, QA tester will develop and maintain test cases and testing will be outside of the web browser.

But as compared to QTP, Selenium is less user-friendly and also requires core java Programming knowledge and supports limited browsers.

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