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Relative Review of Automated Testing Tools: (QTP) Quick Test Professional, Selenium and Test Complete

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ABSTRACT
Software Testing is a process of executing a program with the intent of finding an error, it provides a means to reduce errors, minimize maintenance and overall software costs. In today's scenario testing is an essential parameter in process of software development lifecycle (SDLC). In most of the cases testing is done through some automation tools. It is to examine & modify source code. Effective Testing produces high quality software. The objective of the paper is to make a relative study of some widely preferred testing automation tools, such as **Selenium** (free open source), HP **Quick test professional** (QTP) and **Test Complete** (TC). The aim of this research paper is to evaluate and compare three automated software testing tools to determine their ease of operation, usability, area of application and efficiency.
Keywords: **-** SDLC, STLC, White box testing, Black box testing, Selenium, QTP, TC

I. INTRODUCTION

A software development life cycle (SDLC), is a structure imposed on the development of a software product. Software testing refers to process of evaluating the software with intention to find out error in it. Software testing is a technique aimed at evaluating an attribute or capability of a program or product and determining that it meets its quality. Software testing is also used to test the software for other software quality factors like reliability, usability, integrity, security, capability, efficiency, portability, maintainability, compatibility etc [1].
The aim of software testing process is to identify all the defects existing in a software product. It is the process of exercising and evaluating a system or system components by manual automatic means to verify that it satisfies specified requirements or to identify differences between expected and actual results [2].

Testing identifies faults, whose removal increases the software quality by increasing the software's potential reliability. Testing is the measurement of software quality. We measure how closely we have achieved quality by testing the relevant factors such as correctness, reliability, usability, maintainability, reusability and testability. Software is not unlike other physical processes where inputs are received and outputs are produced [3]. There are two ways of testing that are manual or automation. 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 [4]. 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 [5].

Automation testing covers all the problems of manual testing. In this tester runs the script on the testing tool and testing is done. The tester may or may not know the inside details of the software module under test [6]. Therefore either white box testing or black box testing can be used. White box testing is highly effective in detecting and resolving problems, because bugs can often be found before they cause trouble [7]. White box testing is the process of giving the input to the

system and checking how the system processes that input to generate the required output. White box testing is also called white box analysis, clear box testing or clear box analysis [7]. White box testing is applicable at integration, unit and system levels of the software testing process [6].Black box testing is testing software based on output requirements and without any knowledge of the internal structure or coding in the program [7]. Automation testing automates the steps of manual testing using automation tools such as Selenium, QTP and Test Complete (TC) [8]. It increases the test execution speed, more reliable, repeatable, programmable, comprehensive, and reusable.

Recently, the features of automated software testing tools, TC and Selenium have been studied and compared with the QTP [9-10].The shortcomings in selenium have been discussed [11]. QTP provides inbuilt support to reduce the redundancy of test cases for a particular application by providing data driven testing. We have provided number of inputs for a single test case.QTP is mainly used for functionality testing. QTP is user friendly both technical and non-technical users can easily access [12].The important of value design user interfaces has increased a lot so it is important to test these user interfaces before they will be used by untrained customer.

In the present work, we have planned to study the latest version of selenium i.e. Selenium 2.0.0. In this testing we have checked the various controls placed on the graphical user interface of web application and the boundary value analysis [15] of the user inputs. We have planned to execute the test case written for some web applications.

II. METHODOLOGY

2.1 Automated Software testing tools

When we start or research for the right automated software testing tool, it is important to create a list of requirements tore view when choosing a tool for evaluation. If we do not have list of requirements, we may waste time downloading, installing and evaluating tools that only meet some of requirements, or may not meet any of them. This research evaluate three major tool vendors that are Selenium , Quick Test Pro (QTP) and Test Complete on their test tool characteristics, test execution capability, test resorting capability, scripts reusability capability, play back capability, and vendor qualification[4-7].

Because of the more advantages of the automation testing over manual testing, various companies are engaged in developing various automated test tools for various applications. There are two types of test tools.

- Open source test tools
- Commercial test tools

Open Source Test tools- These test tools are free for the users to use. It can be downloaded from the internet or can be obtained by the vendor without any charges e.g. Selenium, test tools such as QTP and TC are not free.

2.1.1 Selenium

Selenium IDE is a free and open source add-on for the Firefox web browser. It can be easily downloaded from the internet using selenium web site. It is primarily used by the Web development community to perform automated testing of web applications. In this paper firstly we analyzed the Integrated Development Environment of Selenium a Software testing tool. Secondly we have performed the black box testing of web application nrhmsirsa.org

The selection of particular automated testing tool is based on the type of application we are testing and the cost associated with the tool. In the present work, we have evaluated the open source software testing tool Selenium. Our main motive is to perform black box testing on the web application www. nrhmsirsa.org

2.1.2 Quick Test Professional

Quick Test Professional is a graphical interface record-playback automation tool. Trial version of

QTP can be downloaded from the official web site of HP. In this paper firstly we analyzed the Integrated Development Environment of QTP a Software testing tool. Secondly we have performed the functional testing of web application goodreads.com and we have discussed the main features of QTP. Automated testing tool QTP provides the industry's good solution for functional test and regression test automation – addressing every major software application and environment. Quick Test Professional also enables us to test Java applets and applications, and multimedia objects on Applications as well as standard Windows applications, Visual Basic 6 applications and .NET frame work applications.

It works by identifying the objects in the application user interface or a web page and performing desired operations (such as mouse clicks or keyboard events); it can also capture object properties like name or handler ID. HP Quick Test Professional uses a VBScript scripting language to specify the test procedure and to manipulate the objects and controls of the application under test.

To perform more sophisticated actions, users may need to manipulate the underlying VBScript. Although HP Quick Test Professional is usually used for "UI Based" Test Case Automation, it also can automate some "Non-UI" based Test Cases such as file system operations and database testing. . In the present work, we have evaluated the functional testing tool QTP. Our main motive is to perform functional testing on the web application goodreads.com and Data driven testing.

2.1.2 Test Complete

Test Complete is a graphical interface record-playback automation tool. Trial version of 30 days can be downloaded from the official web site of Smart bear. Test Complete supports various testing types and methodologies: unit testing, functional and GUI testing, regression testing, distributed testing. Test Complete supports two types of applications, web Applications and window applications. Testing is a process of analyzing a software item to detect the differences between existing and required conditions and to evaluate the features of the software. It is the important phase of system development life cycle.

Software companies follow the complete software testing life cycle to test the application The selection of particular automated testing tool is based on the type of application we are testing and the cost associated with the tool Test Complete offers automated functional, unit, regression, manual, data-driven, object-driven, and distributed, HTTP load, stress and scalability testing in one easy-to-use it is a full-featured environment for automated testing of Windows, .NET, Java and web applications. It has been designed to free developers and QA departments from the massive drain on time and energy required by manual testing.

III. EVALUATION STUDY

There are a number of open source web testing and window application tools available in the software market. Although the core functions of these tools are similar, they differ in functionality, features, usability. For this study we use the current version of selenium that is 2.0.0 we will discuss the following parameters

FEATURE	SELENIUM	QUCIK TEST PROFESSIONAL	TEST COMPLETE
Support for operating system/ platforms	Supports Windows PC/ MAC/ UNIX Platforms.	QTP supports only Windows.	Windows 7, Windows Vista, Windows Server 2008 or later operating systems.
Platform dependency	With Selenium these tasks can be easily accomplishe d.	It is difficult to deploy smoke tests for web applications using QTP especially with Windows7.	It is difficult to deploy application using.
Programmi ng skills	For using Selenium one needs to have programmin g skills.	QTP is quite easy to use. It is quite easy to edit the script, parameterize, navigate	TC is good for both web based and desktop application.
Usage	Selenium needs quite a bit of expertise	QTP is quite easy to learn in a short time.	Support for all 32-bit and 64-bit window application.
Database applications	With Selenium one needs to exert hard to do the same job.	QTP works very well with database applications.	TC works very well database application.
Report Generation	Selenium users don't enjoy such luxury as enjoyed.	With QTP we can easily generate most comprehensive reports due to the availability of an efficient online help.	Report generation is an easy-to-use utility that is support along with TC and lets you generate dump files.
Licensing Cost	Selenium is open source software. So, there's no licensing or renewal cost for this tool. It is free of cost.	Licensed and very Expensive, Ten user license costs approx. 60L.	$2K Enterprise Seat License

IV. CONCLUSION

One can select a testing tool based on the type of application need to be tested, budget, and the efficiency required. If your test automation requirements are getting fulfilled with Test Complete, there is no need to go for QTP at a higher cost. Both these tools solve the same purpose, it is just that QTP is a versatile tool for a critical and more risky Application Under Test (AUT).Selenium should be the case of preference if you don't want to spend money on testing tool as it lags behind the other two in many aspects. Though QTP is an expensive option it offers the best facility and reliability among the three.

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