



COMPARATIVE STUDY OF AUTOMATED TESTING TOOLS: RATIONAL FUNCTIONAL TESTER, QUICK TEST PROFESSIONAL, SILK TEST AND LOADRUNNER

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ABSTRACT

Software testing is used to identify the defects, improve the quality of software and reduce overall software costs. Automated testing tools enable testers to easily automate the entire process of testing in software testing. A lot of testing tools have been developed for use throughout the various SDLC phases. But the major part is the selection of tools from a pool of various categories of tools. Apart from the high cost of these tools, a single tool may not cover the whole testing automation. Thus, tools must be selected according to their application and needs of the organization. The objective of the paper is to conduct a comparative study of automated tools such as available in market in IBM Rational Functional Tester (RFT), LoadRunner, Silk Test and HP Quick test professional (QTP) and determine their usability and efficiency. Software testing tools is used to test the applications likes: web based system, web application etc.

Keywords:

LoadRunner, QTP, RFT, SDLC, Silk Test, Web Application, Web Testing

I. INTRODUCTION

A software testing is a speedily growing area within software engineering that is receiving increasing notification both by computer science theoreticians and practitioners. Its main aim is to confirm the quality of software system by thoroughly workout the software in carefully controlled conditions [1]. Quality factors of software like consistency, scalability, veracity, confidentiality, maintainability, capability, efficiency, comparability, portability, etc. [2].

The main objective of software testing process is to detect all the errors present in a software product. It is the process of planned, specified, designed, implemented, and quantified. Testing must be governed by the quality attributes of the software product. Thus, testing is a dual-purpose process, as it is used to detect bugs as well as to establish confidence in the quality of software [1].

Testing identifies faults, whose removal increases the software quality by increasing the reliability, software potential. Testing is the activity to find software quality. We find how closely we have achieved quality by testing the relevant factors such as reliability, maintainability, correctness, usability, re-usability and testability. Software is not unlike other physical processes where inputs are received and outputs are produced [3].

Testing is of two types that are manual testing or automated testing. Manual testing is performed by the testers. Testers test the software manually in order to detect errors. It involves a tester to play the function of an end user, and use most of all attributes of the application to ensure its right behaviour. They track a written test plan that leads them through a set of important test cases [2]. The limitations with manual testing are, it is time consuming process, has no scripting facility, great work required, not reusable and some errors remain uncovered [4]. Automation testing screens all the problems of manual testing [2]. In automation testing, automated software tools enhanced the software testing process. Test automation is the most glamorous part of software testing. In this tester runs the script on the testing tool. Automation testing automates the steps of manual testing using automation tools such as RFT, QTP, Silk Test and Load Runner [5, 6]. It increases the execution speed, repeatability, reliability, reusable, comprehensive and programmable.



Recently, the features of automated software testing tools, RFT, Silk Test and LoadRunner have been studied and compared with the QTP [5, 6]. QTP provides inbuilt support to reduce the redundancy of test cases for a particular application by providing data driven testing. QTP is mainly used for functional testing. It is user friendly [7]. Manual testing is chosen to analyze the application requirements, and to create the High and Low level design documents. Automation testing is done for graphical user interfaces and the flow control of the application [8]. The automation testing tools can be compared on the basis of parameters such as Capability of generation of scripts, Data-driven testing, Script re-usability, recording efficiency, execution speed, play back ability, Cost, and Easy to learn [9].

II. METHODOLOGY

2.1 Automated Software Testing Tools

When we start or research for the right automated software testing tool, the major part is the selection of tools from a pool of various categories of tools. Apart from the high cost of these tools, a single tool may not cover the whole testing automation. Thus, tools must be selected according to their application and needs of the organization. This research evaluate four major tool vendors that are IBM Rational Functional Tester (RFT), Quick Test Pro (QTP), Silk Test and LoadRunner on their test tool features, test performance ability, test resorting ability, scripts re-usability ability, play back ability and seller qualification. [5, 6]. There are two types of Test tools [15]-

- 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].

Commercial test tools- These test tools are expensive. Due to this some companies developed their own tools and use scripting language like PERL and RUBY.
e.g. LoadRunner, RFT, Silk Test [5].

2.1.1 IBM Rational Functional Tester

IBM Rational Functional Tester is an automated functional testing and regression testing tool. This software enables automated testing capabilities for regression, functional, GUI, and data-driven testing. Rational Functional Tester is an object-oriented automated testing tool that tests VB.NET, HTML, Java and Windows applications, and record robust and reliable scripts that can be played back to validate new builds of a test application. The recording mechanism creates a test script from the actions. Test scripts can then be executed by Rational Functional Tester to validate application functionality. Rational Function Tester supports a range of applications, such as web-based, .Net, Java, Siebel, Power Builder, Ajax, GEF, Adobe PDF documents [10].

2.1.2 Quick Test Professional

Quick Test Professional is an advanced, automation testing software for building functional and regression test suites. It captures, verifies and replays user interaction automatically and help tester quickly identify and reports on application effects, while providing highly developed functionality for tester collaboration. QTP also test Java applets, Java based applications, 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 QTP scripting language is VB Script. To perform more complicated actions, users may need to manipulate the underlying VB Script. 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 [11].

2.1.3 Silk Test



Silk Test is a software performance testing tool across web, mobile and business applications. It was developed by Segue Software then afterward it is acquired by Borland in year 2006. In year 2009 Borland was acquired by Micro Focus International. Silk Test scripting language is 4Test for automation scripting. It is also an object oriented language similar to C++. It can also perform Database validation using DB Tester. Silk Test supported extensions like: .NET, Java (Swing, SWT), DOM, Internet Explorer, Google chrome, Firefox, Windows GUI [12].

2.1.4 LoadRunner

A software testing tool, HP Load Runner works by creating virtual users who take the place of real users' operating client software, such as Internet Explorer, sending requirements using the HTTP protocol to IIS or Apache web servers. HP Load Runner can create thousands of concurrent users to put the application through the rigors of real-life user loads, while collecting information from main infrastructure components. The output can then be analysed in detail to discover the reasons for particular behaviour. HP Load Runner supports various set of rules bundles for load testing: .NET Record, Database, DCOM, GUI Virtual Users, Java Replay, Network, Remote Access, Remote Desktop, Internet Application, Web 2.0, Web and Multimedia and Wireless.

HP Load Runner is a test automation product from Hewlett-Packard for application load testing: examining system behaviour and presentation while generating real load [13].

III. EVALUATION STUDY

The growing number of web applications combined with an ever-growing Internet user mass, highlights the importance of developing high-quality products. However, many attributes of quality web based system such as ease of switching, scalability, maintainability, usability, compatibility and platform in-dependency, security, readability and reliability are not given due consideration during development. Therefore, proper testing of web-based system is needed in ensuring consistency, robust and high-performing operation of web applications [1]. Keeping in view the above mentioned features, we have selected four web testing tools for comparison which are IBM Rational Functional Tester version 8.5.1, HP Quick Test professional version 12.01, Silk Test version 15.5, and LoadRunner version 12.01.

IV. COMPARISON BETWEEN RFT, QTP, SILK TEST PERFORMER AND LOADRUNNER

Comparison between these four tools is made on the basis of parameters [2, 15]:

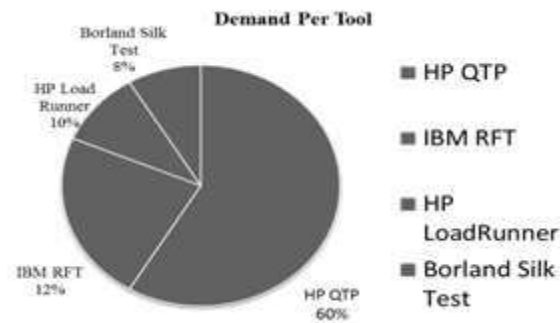
- 1- RECORDING EFFICIENCY
- 2- CAPABILITY OF GENERATION OF SCRIPTS
- 3- DATA DRIVEN TESTING
- 4- TEST RESULT REPORTS
- 5- REUSABILITY
- 6- EXECUTION SPEED
- 7- PLAYBACK OF THE SCRIPTS
- 8-EASY TO LEARN
- 9-LICENSING COST
- 10- TECHNOLOGY USED

FEATURES	IBM RATIONAL FUNCTIONAL TESTER	HP QUICK TEST PROFESSIONAL	SILK TEST	LOADRUNNER
PROTOCOL BETWEEN CLIENT AND SERVER	HTTP, TCP Socket, SAP, Citrix, Siebel, TN3270.	HTTP/HTML and SAP.	TCP/IP, NETBIOS/ NETBEUI.	HTTP/HTML, ODBC, SQL.NET, DCOM, SAP.



OBJECT ORIENTED LANG. SUPPORT AND SCALABILITY	Visual Basic script or JavaScript only.	Visual Basic script or JavaScript only.	4TEST as scripting language..	Supports scripting in Virtual user like C Virtual user, Java Virtual user, JavaScript Virtual user, VB Virtual user, VB script Virtual user.
OPERATING SYSTEM/ PLATFORMS	Window and Linux only.	Window XP, Window 7, Window Vista, Window 8/8.1.	Windows 8.1 and support multiple platforms.	Windows 8.1 and Linux only
PROGRAMMING SKILL	Recording are replayed during playback. Many values selected using the shift keys did not work with the IBM-RFT.	Easy to edit script, parameterize, navigate, playback and validate the result.	Recording a script once and replay it all the others browsers, without any modifications.	Script can be complex and difficult to understand, especially the application processes being employed.
USAGE	Requires some programming experience.	Easy to learn in a short time.	Easy to learn in a short time.	Support 64-bit Window application.
DATABASE APPLICATION	Works good with database applications.	Works good with database applications.	Works good with database applications.	Works very well with database applications.
PLATFORM DEPENDENCY	It is used for smoke testing in IBM.	Difficult to deploy smoke test for web application especially with Window 7.	Run on Windows version XP SP3, Vista SP1 or SP2, 7, 2008, 2008 R2.	It is for load testing. It is difficult to deploy application using.
TECHNOLOGY USED	Mozilla Firefox, Internet Explorer, Google Chrome, etc.	Firefox v31, Safari v6/v6.10/v7.0 on Mac OS, IE 8, IE 11, Chrome v36.	Mozilla Firefox, Google Chrome, Internet Explorer 10, Java SWT, Java AWT, etc.	Silk Test supports multiple technologies.
REPORT GENERATION	It allows default reporting in HTML, but custom coding is required for other interfaces.	It allows standard reporting format in HTML, XML, etc. (Default is its own UI and HTML).	Recording a script once and replay it all the others browsers, without any modifications	Script can be complex and not easy to understand, especially the application processes being employed.

V. DEMAND PER TOOL [14]



VI. CONCLUSION

One can select an automated testing tool on the basis of application type need to be tested, efficiency, and budget. From Above Table both LoadRunner and Silk Test are performances testing tools which can be used to test the load behaviour of an application. Both tools are able to produce the script for Siebel Applications. But the Load Runner default support with C language and Silk Test support with BDL (Benchmark Description Language).

In case of QTP and RFT if your test automation requirements are getting fulfilled with Rational Functional Tester, there is no need to go for QTP at a higher cost. It is just that QTP is a multipurpose tool for a critical and more risky Application under Test (AUT). In conclusion, QTP is the good tool among the four.

VII. ACKNOWLEDGEMENT

We wish our sincere gratitude to SRMSCET, Bareilly for providing facilities to carry out the work and we thankful to our friends who are working in testing share their experiences with us.

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