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The Analysis of Automated Testing Tools for Web Based Applications

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Abstract: Testing is an integral part of any software project development. Automated software testing is becoming more and more important for many software projects in order to automatically verify key functionality, test for regressions and help testing team to run a large number of tests in a short period of time. Software can be tested manually as well as using automated tools. There are several automated tools, including open source tools to test the performance and functionality of web-based application. This paper provides the analysis of different automated testing tools used to test web applications.

Keywords*: Web application testing tools, Regression testing tools*

I. INTRODUCTION

In the era of Information Technology, software has become the lifeline of every human activity. When software play the crucial role in our lives, it is very important that the software used should be a high quality and high reliable. Software testing plays an important role to develop quality software. Software testing can be done manually or by using automated tools. Manual testing is a very time consuming process and it may be error-prone. To overcome the drawbacks in manual testing automated testing tools can be used. The stages involved in Automated Test Life-cycle Methodology (ATLM) are incorporates:

- The decision to automate testing,
- Acquisition of test tools, and
- The introduction of the tools to the project.

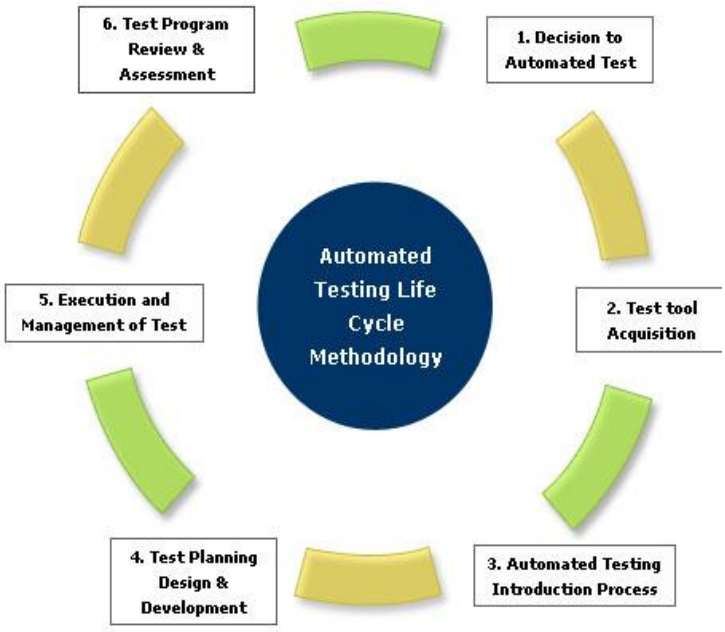

Figure 1: The Automated Test Life-cycle Methodology

II. WEB APPLICATION TESTING TOOLS

Web testing is the software testing that focused on web applications. A web application may face issues like issues such as website functionality, security, accessibility, usability, compatibility and performance. Testing should be done based on the above factors. Building automated tests for web applications can be challenging because the user interface of web application might change regularly, because of incompatibilities between browsers and because it usually need to support various server or client platforms.

Web base automate testing tools are grouped based on the following web testing types and analysis is made.

- Load, stress and Performance testing Tools
- Web Functional, GUI or Regression testing Tools
- Link Manager testing tools
- Web Site Security testing Tools
- Cross-browser testing tools

A. Load, Stress and Performance Testing Tools

Performance testing tools are basically for system level testing, to see whether or not the system will stand up to a high volume of usage. A loadtesting is to check that the system can handle its expected number of transactions.A volume testing is basically to check that the system can handle a large amount of data, e.g. many fields in a record, many records in a file, etc. A stresstesting is one that goes beyond the normal expected usage of the system (to see what would happen outside its design expectations), with respect to load or volume.

The purpose of the performance testing is to measure characteristics, such as response times, throughput or the mean time between failures (for reliability testing). This can be done in different ways depending on the tool, such as different user profiles, different types of activity, timing delays and other parameters. Adequately replicating the end-user environments or user profiles is usually key to realistic results. If the performance is not up to the expected standard, then some analysis needs to be performed to see where the problem is and to know what can be done to improve the performance.

Features or characteristics of performance-testing tools are:

- To generate load on the system to be tested;
- To measure the timing of specific transactions as the load on the system varies;
- To measure average response times;
- To produce graphs or charts of responses over time.

By using Load, Stress and Performance Testing Tools are

WebLOAD, Apache, JMeter, NeoLoad, LoadRunner, LoadUI , Loadster , Load impact, Wapt , QtestTelerik ,Test studio

B. Regression Testing Tools

Regression means retesting the unchanged parts of the application. Test cases are re-executed in order to check whether previous functionality of application is working fine and new changes have not introduced any new bugs. This test can be performed on a new build when there is significant change in original functionality or even a single bug fix.when programmer fix any bug or add new code for new functionality to the system. There can be many dependencies in newly added and existing functionality. It is difficult to perform GUI (Graphical User Interface) regression test when GUI structure is modified. The test cases written on old GUI either becomes obsolete or need to modify. Reusing the regression testing test cases means GUI test cases are modified according to new GUI. But this task becomes cumbersome if you have large set of GUI test cases. We have tried to provide some web functional/regression testing tools.

*WinRunner:*HP WinRunner software is an automation Functional GUI testing tool. This tool allowed User to capture, verified and replayed UI interaction as test script. WinRunner is originally written by Mercury Interactive.

QTP:QTP (Quick Test Professional) a Windows based software testing tool used to test the applications on the web or desktop, best for "Functional" and "Regression" testing, given by Hewlett Packard (HP). Its UI is called as an Integrated Development environment (IDE) comes with various functionalities which motivates tester towards testing.

Watir:Watir is pronounced as water. It is acronym for web application testing in ruby. Watir is an open source family that uses ruby libraries for automation web browsers4. Watir allows testers to write tests that are easy to read and maintain. Watir is simple and flexible too.

Selenium: Selenium is one of the most popular automated testing suite. Selenium is designed in a way to support and encourage automation testing of functional aspects of web based applications and a wide range of browsers and platforms. Selenium suite is comprised of 4 basic components; Selenium IDE, Selenium RC, WebDriver, Selenium Grid.

SkillTest: SilkTest is an automation tool that is specifically designed for regression and function testing.. The SilkTest provides the flexible and robust test scripting language that is a built in recovery system for unattended testing, and silkTest has the ability to test across platforms, browsers and technologies. Silk Test offers test planning, validation, management, and direct database access.

C. Link Manager Testing Tools

All websites are made up of many links or we can say all websites are based on links. Any broken and wrong link can take you to some wrong page and you will get wrong information about the website. So, it is very much important to correct the link using link manager testing tool.

*SpringTrax***:** SpringTrax is a cross-platform link checker provided by SpringTrax Inc., expert in finding broken links, and also expert in discovering, fixing, and stopping 404 errors.

LinkTiger: LinkTiger is also a link checker, works on e-mail alerts, dashboard, and rich custom reports, supports Linux, Mac, Windows, and Windows Phone platforms. Its features can scan PDF, CSS, Flash and MS Office files.

LinkScan: LinkScan is a strong link checker and website mapping tool for Windows, Unix, Linux and Mac OS X, provides very strong test automation skills for the web based applications.

D. Web Site Security Testing Tools

As more and more vital data is stored in web applications and the number of transactions on the web increases, proper security testing of web applications is becoming very important. Security testing is the process that determines that confidentialdatastaysconfidential (i.e. it is not exposed to individuals/ entities for which it is not meant) and users can perform only those tasks that they are authorized to perform (e.g. a user should not be able to deny the functionality of the web site to other users, a user should not be able to change the functionality of the web application in an unintended way etc.).Most of the virus comes to the system through application which is uploaded on internet that can corrupt the system and the application which is on system. We cannot stop using application which is on internet, so, the best thing is; use those applications securely by using website security testing tool.

Vulnerability: This is a weakness in the web application. The cause of such a "weakness" can be bugs in the application, an injection (SQL/ script code) or the presence of viruses.

URLmanipulation: Some web applications communicate additional information between the client (browser) and the server in the URL. Changing some information in the URL may sometimes lead to unintended behavior by the server.

SQLinjection: This is the process of inserting SQL statements through the web application user interface into some query that is then executed by the server.

*XSS(Cross Site Scripting):*When a user inserts HTML/ client-side script in the user interface of a web application and this insertion is visible to other users, it is called XSS.

*Spoofing:*The creation of hoax look-alike websites or emails is called spoofing.

Those applications securely by using website security testing tool are *NTOSpider, Brakeman, SiteDigger, Netsparker, NMap ,OWASP.*

E. Cross-Browser Testing Tools:

Cross-browsing issue comes due to comparison of two or more browsers output values. So, to come out of that issue, use cross-browser testing tool,

Browsera: With Browsera, it is possible to test layout, JavaScript, dynamic pages, password-protected pages, etc.,

Browsershots: It allows testing the website in any browser and operating system. This is widely used cross browser testing tool because of its features and available customizations.

BrowserSeal: It is a cross browser testing tool allows capturing an image of the website under different browsers with a single click of a mouse. Also it is possible to navigate images to spot layout and UI issues.

CONCLUSION

In this paper we have Analysis of Automated testing tools for Web Based Applications. Web based automation testing is concerned with testing web based applications in an automated way. A variety of automation tools are feasible for testing web applications. A popular way of testing web sites is using Selenium tool, which can record your behavior as you use the web site and then play back the steps automatically in your web browser. The main benefit of using automated tools is that you can avoid the manual effort required to test each feature of your web site by automating the tests. From the study on web based automation testing and the automated tools for this type of testing, we conclude that Selenium is the best available automation tool for web applications till now.

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