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Evaluation of the Characteristics of Testing for Automated Software

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Abstract

Software testing is regarded as one of the most significant stages in software development since it determines whether or not the system fits the user needs and specifications. Software testing may be done in two ways: manually or automatically. Automated testing allows software testers to easily automate the software testing process, making it more efficient in terms of time, cost, and usability. There are several automated testing programmes available, both free source and commercial. This article gives a comparison assessment of characteristics of open source and commercial testing tools, which may assist users in selecting the best software testing tool for their needs.

Keywords: *Software testing, Software development, Automated Software, Software testing tools*

INTRODUCTION

Software development entails activities such as software programming, documentation, and testing in order to create a working application. Program testing is a vital technique for determining if the software fulfils the user requirements and delivering a working application. It is critical to the successful implementation of any system application.

An application can be tested manually or automatically using software testing tools. For manual testing, a tester assumes the role of an end-user and checks the correct functioning of the majority of the application's functionalities. As a result, manual testing is time-consuming and rigorous, and it does not always efficiently eliminate all issues. It is a good option for tiny businesses that do not have the

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financial means to invest in automated systems.

Manual testing presents obstacles, which are addressed by automated testing. Testers can use automated testing to generate repeatable and reusable test scenarios. These test scenarios can then be run as many times as necessary. With the rising complexity of software development, it is also necessary for the software team to employ automated software testing tools to test the application's quality and functioning. When it comes to time, cost, and usability, an automated test is superior. There are several automated testing tools available on the market, both free source and commercial. There are software tools that only do a single sort of testing and are restricted to a specific language. While software testing solutions that handle a wide range of applications and have more features and capability may be more expensive. Knowing the distinctions between the two will assist the user to select the best testing tool for their situation. The purpose of this research is to conduct a comparative analysis of available software automated testing tools by comparing the characteristics of each tool in terms of kind of testing, software support, licence and pricing, and other factors.

EXAMINATION OF RELATED LITERATURE

According to a systematic literature review and practitioner survey, the benefits of test software include reusability, repeatability, and time saved in test runs. The research also argues that test automation is advantageous when several regression testing cycles are required. Among the stated limitations of automated testing tools are the high initial cost of developing test cases, the initial investment in the acquisition of the test automation tool, and the requirement for subsequent expenditure in training people. When compared to manual testing, test automation is more reliable, programmable, reusable, comprehensive, and maintainable, saves money and time in the long term, has higher test coverage, and is faster than human interactions.

The key advantages of automated testing over manual testing are efficiency and accuracy. Using automated test scripts produces a higher return on investment than manual testing. Software testing is one of the most time-consuming and labor-intensive activities in software development. As a result, software engineers have been increasingly interested in seeking to improve testing in order to cut development expenses.

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Presents a discussion of test metrics, which serve as a crucial measure of the efficacy of the software testing process. Organization metrics, project metrics, process metrics, product metrics, and static and dynamic metrics are examples. The term "organisation metric" refers to the effectiveness of a measure in overall project planning and management. Project metrics may be used to monitor and regulate a given project. Process metrics are related to a certain test process, whereas product metrics are related to a specific product, such as a compiler for a programming language. Static metrics are those that can be computed without requiring the product to be executed, whereas dynamic metrics need the execution of code. Testing metrics are used to increase software productivity and quality. Developed a methodological framework to assess testing approaches or tools that may be employed in diverse case studies. The efficacy, efficiency, and user satisfaction of the case studies are used to assess their implementation. Software test tools aid software developers in the examination of programme flaws, the verification of functionality, and the assurance of the dependability of the software generated. Various testing tools were classified according to their application categories and then compared in terms of price and functionality. Software testing is still one of the most popular methods for assessing and enhancing the quality of a software programme. Automated test input creation is one of the contributions to testing research. Aside from that, there are new frameworks for test execution that support shorter testing cycles. The article explored with automated testing utilising three distinct tools. Although automation has a significant initial installation and maintenance cost, when executed several times, test automation can provide astonishing results in the long run. Test automation improves the overall efficacy of the testing process due to the repeatability and reusability of test scenarios. When selecting a tool to educate software developers and researchers, examine the mobile platform support, the lead time for the new OS, test coverage, text support (languages), test process, scripting capabilities, pricing, and service support.

OUTCOMES AND ANALYSIS

The following automated software testing tools were chosen for this paper:

1. The Selenium IDE. Selenium is a portable open source testing tool for online applications that support many browsers, platforms, and operating systems.

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2. Quick Test Professional/Unified Functional Testing (QTP/UFT). UFT (previously QTP) is a record-playback automation application with a graphical user interface.

3. Test Complete. TestComplete is a programme that assists in the automation of software quality testing for websites, online apps, and Windows desktop applications.

4. Ranorex. Ranorex is a graphical user interface automation framework that may be used to test desktop, online, and mobile applications.

Load Runner, for example. Hewlett Packard's Stress Runner is a software testing tool used to test applications, evaluate system behaviour, and performance under load.

Watir. Watir is an open source automated testing tool that is easy and adaptable. SahiPro. Sahi Pro is a cross-platform open source testing tool for web applications. SoapUI. SoapUI is a free and open-source testing tool for online services.

Parameter for Evaluation

To make sense of and examine the many aspects of automated testing tools, we must first determine the features that will be utilised for the analysis of differentiating similarities and differences between each instrument. We may consider the following crucial aspects while deciding on the best tool among automated testing tools: Platform and technology support, flexibility for testers of all ability levels, feature-rich but simple to use.

Create automated tests and automated tests that are reusable, maintainable, and resistant to changes in the user interface of the programme. Table 1 displays the tool features for comparing software testing tools in order to satisfy the paper's study aim.

Table 1 Tool features of software testing tools

Criteria used	Definition	References
Cross Platform	Operating system supported	[17-18]
Cross Browser	Browser tools supported	[17]
Record Playback	Ability of tool to record scripts	[17, 19, 20]
Script Language	Programming languages used to edit test scripts or for the creation of testing scripts	[17, 18, 20]

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Ease of learning	How easy the tool is used	[17, 19, 21]
Data driven	The ability of tool to reduce efforts like making it possible to make the scripts access the different sets of input data from	[17, 20]
Programming skills	Programming skills needed	[17, 19]
Report generation	How result is represented	[17, 19-21]
Cost	Whether free or licensed	[17, 19-20, 22]
Function	Type of testing supported	
Others	Advantage/ Disadvantage/	

CONCLUSION

The study examines the many characteristics of automated testing technologies such as Selenium, QTP/UFT, TestComplete, Ranorex, Watir, Sahi, and SoapUI. Because automated software testing has become a need for businesses, we may pick which of the automated testing tools to employ for a specific sort of testing, depending on the conversation. If the project cost is a factor in tool selection, open-source tools like Selenium are the preferable choice. If assistance, simplicity of learning, and report production are important factors, licenced solutions such as QTP/UFT are a viable choice. Other automated technologies, including their reaction time, can be added in future works in the research.

REFERENCES

1. Jupudy, N. Saraf and R. Manjula, "Comparative Analysis of Model Based and Formal Based Software Testing Methods," International Journal of Advanced Research in Computer Science and Software Engineering, vol. 6, no. 3, pp. 66-70, March 2016.
2. Fachrurrazi, “The End User Requirement for Project Management Software Accurcay, “International Journal of Electrical and Computer Engineering (IJECE),” vol. 8, no. 2, pp. 1112-1121, April 2018.
3. S. K. Pandey and K. Mustafa, “A Comparative Study of Risk Assessment Methodologies for Information Systems,”
4. Bulltin of Electrical Engineering and Informatics, vol. 1, no. 2, pp. 111-122, June 2012.
5. D. M. Rafi, K. R. K. Moses and K. Petersen, "Benefits and Limitations of Automated Software Testing: Systematic Literature Review and Practitioner Survey," 2012 7th

Page 83-88 © MANTECH PUBLIATIONS 2021. All Rights Reserved

International Workshop on Automation of Software Test, 2012.

6. N. H. Saad and N. S. A. Abu Bakar, "Automated Testing Tools for Mobile Applications," The 5th International Conference on Information and Communication Technology for The Muslim World (ICT4M), 2014.
7. Vishawjyoti and S. Sharma, "Study and Analysis of Automation Testing Techniques," Journal of Global Research in Computer Science, vol. 3, pp. 37-43, 2012.
8. H. Kaur and G. Gupta, "Comparative Study of Automated Testing Tools: Selenium, Quick Test Professional and Testcomplete," International Journal of Engineering Research and Applications, vol. 3, no. 5, pp. 1739-1743, 2013.
9. T. Bharti and E. Vidhu dutt, "Functionality Appraisal of Automated Testing Tools, "International Journal of Computer Science Trends and Technology (IJCST), vol. 3, no. 1, pp. 129-134, 2015.
10. M. Monier and M. M. El-mahdy, "Evaluation of automated web testing tools," International Journal of Computer Applications Technology and Research, vol. 4, no. 5, pp. 405-408, 2015.
11. N. Tiku, A. Parkar, I. Rampurawala and A. Menon, "Performance Analysis of Automation Testing Tools for WPF Application," International Journal of Research (IJR), vol. 2, no. 6, pp. 540-544, 2015.
12. V. Malik and M. Gahlan, "Comparative Study of Automated Web Testing Tools," International Journal of Latest Trends in Engineering and Technology (IJLTET), vol. 6, no. 3, pp. 367-374, 2016.

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