

Automation Testing in Software Organization

Anagha Dongre¹, Abdullah Shaikh²

¹Student of Late Bhausaheb Hiray S. S. Trust's Institute of Computer Application,
Bandra East, Mumbai, Maharashtra, India

²Student of Late Bhausaheb Hiray S. S. Trust's Institute of Computer Application,
Bandra East, Mumbai, Maharashtra, India

Abstract: *In software testing, automation testing plays a huge role for increasing test efficiency of the software which is under test. Sometimes manual testing may not be efficient due to its inconsistency, lack of coverage and none repeating in nature. To overcome this issue, Test automation is used in software industry. This research paper will present a comprehensive study of Automation testing and comparison between types of Automation testing tools used in the software organization.*

Keywords: Automation Testing, Testing, Tools, Website, Software, Selenium, Katalon Studio, Tricentis, UI Path, Cypress

1. Introduction

Most of the companies are opting for Software Automation Testing to achieve benefits such as improvement in quality, time to market and less human interaction, but various analysis shows that achieving this is not easy. Achieving efficient Automated Testing is dependent on how to perform tests within a shorter time and with less effort. Automation testing is most commonly done on Website, Mobile apps, API and Desktop application. There are various tools free /paid available in market which support test automation for these type of applications.

Automation testing is a methodology that uses an application to implement the entire life cycle of the software in minimum time and gives efficiency and effectiveness to the testing software. In automation testing, the tester writes scripts and uses suitable application software to test the software application. Automation is basically automated processes that consist of lots of manual activities. In other words, automation testing uses automation tools like Selenium, Katalon Studio, Tricentis, UiPath, Cypress, etc., to write test script and execute test cases, with no or minimal manual involvement required while executing an automated test suite. Usually, automation testers write test scripts and test cases using any of the automation tool and then groups test several cases to form a suite

In automation testing, we automate the steps of manual testing using automation tools. Automated test scripts are fast to execute and they are repeatable in nature. The environment may be functional, performance or exception testing etc. Testing tool should be selected on the basis of its compatibility with checklist for that purpose of the corresponding tool should be done. Cost is also an essential factor for selection of the tool.

Points to remember before selecting Automation tool for your project:

1. Cost involved in tool
2. Test Coverage
3. Platform supported
4. Setup and Configurations needed for the tool

5. Report generation

6. Languages supported

7. Feasibility of integration with third party tools

2. Literature Review

Authors have conducted a survey for organizations and specialists concerned in automation testing to determine the current practices, tools and opportunities for enhancements in automation testing methods. The survey results are supposed to be used to determine the necessity of the international standard for the capabilities of Software under Test. The target of this Paper is to find out the best way to find various rising tools and methodologies to test software to confirm and ensure the quality constrain in developed product.

We are going to do the comparison of different testing tools on the basis of existing literature and additionally do the comparative study of different automated testing methodologies which will be useful in the selection of testing tool and methodology which is helpful in terms of Cost and Time. This paper offer a feasibility study for business and open source web testing tools serving to developers or users to select the appropriate tool supporting their needs. In software organizations, evaluating and choosing the automation testing tools that best work the project at hand is a very important and difficult task.

3. Problem Definition

People have lot of misconception about automation testing, no doubt automation testing has many benefits and it helps team to save time, effort and resources while it have some limitations. Creating automation scripts require skilled people and now a day's; technologies are getting upgraded rapidly, so organization have to keep their resources up to date with new technology.

An organization sometime lack in finding appropriate tool for their software and even if they found the correct tool it is really important that you have the right team who have the skill set to use that tool efficiently. Automating the test cases is a responsible task and sometimes testers forgot to write the scripts for critical test cases. They choose easy test cases first which risks the coverage of important

Volume 11 Issue 7, July 2022

www.ijsr.net

Licensed Under Creative Commons Attribution CC BY

scenarios and compromising with software quality. Cost is also an important factor while selecting the tool as many of the automation tools which provide advanced in-built packages are in the paid version of that tool.

Objective

The main aim of this thesis is to present a comprehensive study of Automation testing and comparison between types of web Automation tools used in the software organization and tools which we have selected are Selenium, Katalon Studio, Tricentis, UiPath, Cypress. The main aim behind selecting these tools for comparison is because most of the top MNC’s as well as start-up companies are using these tools for automating their website.

Research Methodology

The research method adopted is the Analytical Research method because it uses the facts that have been confirmed already to form the basis for the research and critical evaluation of the material is carried out in this method. Analytical methods make use of quantitative methods as well. This approach gets the qualitative and quantitative primary data by self-reported measures, on the understanding of automation test coverage and actual automation coverage from a sample of industry professionals from the respective organizations.

Analysis

An automation tool is a software itself with the help of which the actual software in focus can be tested, in other words, the automation tool help and serves as a means in doing software testing [1]. The rapid and unparalleled change in technology affects how organizations develop, validate, deliver, and operate software products [2]. Meeting the demands of today’s software quality standard requires testing the software, and the success of the testing project is largely determined by testing technique and automation tool used [3].

Selenium:

Selenium is an open source project for a range of tools and libraries aimed at supporting browser automation. It provides with a playback tool for authoring functional tests across most modern web browsers, without the need to learn a test scripting language (Selenium IDE). It also provides a test domain-specific language (Selenese) to write tests in a number of popular programming languages, including JavaScript (Node. js), C#, Groovy, Java, Perl, PHP, Python, Ruby and Scala. Selenium runs on Windows, Linux, and macOS. It is open-source software released under the Apache License 2.0. [4]

Advantage	Disadvantage
Support multiple browsers	In-build reporting is not available
Support most of the programming languages	Image testing is not possible

Katalon Studio:

Katalon Studio is a tool for web and mobile app automation testing. This tool includes a full package of powerful features that help overcome most of the common challenges in web UI test automation, for example, pop-up, iFrame, and wait-time. This user-friendly and vast range of solution help testers test better, work faster, and launch high quality software. [5]

Advantage	Disadvantage
Open source and free of cost	Support is not received from Community System
Easy test script creation and execution	Support limited features

Tricentis /Tosca:

Tosca testsuite is an enterprise software testing tool, which is used to automate the test scripts. It offers a complete functionality of the test cases so as to provide an effective test management process.

Advantage	Disadvantage
Scripting is not required for TOSCA	It is a paid tool
TOSCA has dedicated support for deployment and adoption	Supported only on windows platform

UI Path:

UiPath is a robotic process automation tool for large-scale end-to-end automation scripting. For an accelerated business change, it provides solutions for businesses to automate routine office activities. It uses a variety of methods to transform tedious tasks into automated processes. [6]

Advantage	Disadvantage
Programing knowledge is not required	Add-on pricing required for additional features
Visual design and fast implementation	Limited security feature

Cypress:

Cypress provides us a visual interface to show what all tests and which all commands are passed, running, or failed. It allows us to test highly interactive applications and also to carry out different tests such as manipulating the DOM, verifying that if some element is available or present on the screen, writing data into /from fields reading or, submitting forms and even redirecting to a different web page without actually making direct modifications to the code.

Advantage	Disadvantage
Easy debugging	Limited browser support
Execution speed is High	Only support javascript

4. Findings

Web Automation Tools	Selenium	Katalon Studio	Tricentis	UiPath	Cypress
Supported Platform	Windows / macOS / Linux / Solaris	Windows / macOS / Linux	Windows	Windows	Windows / macOS / Linux
Setup & Configuration	Coding Required	Easy	Coding Required	Easy	Coding Required
Supporting Languages	Java / C# / Python / JavaScript / Ruby / PHP / Perl	Java / Groovy	Java / C# / Visual Basic	Java / C# / C++ / Python / JavaScript / Visual Basic / PHP / SQL	JavaScript
Advanced Test Reporting	No	Yes	Yes	No	Yes
Pricing	Open source	Open source & Commercial	Commercial	Open source & Commercial	Open source & Commercial
Browser Compatibility	Chrome / Safari / Edge / Opera / Firefox	Chrome / Safari / Edge / Opera / Firefox	Chrome / Firefox	Chrome / Firefox / Safari / Edge	Chrome / Firefox
Review [7]	4.5	4.4	4.4	4.6	4.7

5. Conclusion

As we are moving towards automation in every field, software automating testing is a superior option for testing teams [8]. Presently in market a number of automation software testing tools are available, as discussed in this research also. For this study, five tools were selected that are frequently used in for automation testing of web based applications across multiple organizations [8]. We have performed a comparative analysis on the basis of their characteristic. In selecting tools, if the project cost is to be given higher consideration, open source tools such as Selenium is the better option. If the availability of support, ease of learning, report generation is to be considered, low coding, licensed tools such as Tricentis, Cypress and UiPath are good option. If the project requires testing on multiple browsers, Selenium and Katalon Studio is a good option. This review concludes that, thorough research is required to enhance the quality of tools in various aspects. Still there is no single solution available by which we can achieve complete automation in testing [8]. Hence, as per project requirement one can select the appropriate automation tool

[8] Comparative review of the literature of automated testing tools, Anand Singh Gadwal Department of IT, SVIIT /SVVV University, Indore, MP, India and Dr. Lalji Prasad Department of CSE, SIRT /SAGE University, Indore, MP, India

References

- [1] W. E. Perry, Effective Methods for Software Testing: Includes Complete Guidelines, Checklists, and Templates, Third Edit. 2007
- [2] Mubarak Albarka Umar, Chen Zhanfang, School of Computer Science and Technology, Changchun University of Science and Technology, 7186 Weixing Road, Jilin, China Vol. 8 No.06 Nov-Dec 2019
- [3] H. Bajaj, 'CHOOSING THE RIGHT AUTOMATION TOOL AND FRAMEWORK', Bengaluru, India
- [4] Wikipedia, [https://en.wikipedia.org/wiki/Selenium_\(software\)](https://en.wikipedia.org/wiki/Selenium_(software))
- [5] Tools QA <https://www.toolsqa.com/katalon-studio-tutorial/>
- [6] Simplilearn, <https://www.simplilearn.com/tutorials/rpa-tutorial/what-is-uipath>
- [7] Capterra <https://www.capterra.com/>