

# An Extensive Review of Automation Tool: Selenium

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**Abstract:** Traditionally, automated and manual testing were seen to be distinct, and they were carried out in separate ways. In reality, they are interdependent, as one's limitations are handled by the other. Manual testing might be useful for detecting defects in circumstances where the need changes frequently or where automated tests aren't the most effective. Test automation, on the other hand, has a number of advantages, including repeatability, consistency, and a more efficient and effective processing of test cases (for situations where a large number of test cases need to be executed). The primary distinction between manual and automated testing is that test automation is best suited to situations when repetitive effort is required.

**Keywords:** Automation, Software, Automation Testing.

## 1. Introduction:

Software testing is a fundamental and crucial component of the software development process. Testing is the process of evaluating a system or a module by providing defined inputs and comparing them to the desired outputs in order to identify and correct differences between the desired and actual outputs. Software testing can be divided into two groups. There are two types of software testing: manual testing and automated software testing. We can get a lot of advantages by including automated testing into the software development process. The use of a model to automate the generation of both manual test cases and automated test scripts saves time and money while also increasing coverage and reducing time-to-market. Manual testing refers to the process of manually testing software or applications without the use of software automation tools or test scripts. Manual testing is the process of manually testing software or applications to detect problems and ensure that they meet the requirements. To ensure correct behaviour, a tester must play the position of an associate user and use the majority of the application's features. Before being automatically tested, any new application needs to be manually tested. Manual testing takes more time and effort, but it is necessary to see if automation is feasible. Each and every piece of

computer code is unique. Elementary testing is complete. Because automation testing is not practicable, manual testing is needed. Automation testing is more dependable, faster than human testing, and requires fewer resources. It can run more tests in less time by reusing tests across multiple versions of an application. There are numerous factors to consider while choosing a testing tool. It is simple to integrate, compatible with the application's design and implementation, test execution, and maintenance.

### 1.1 Benefits of Automation Testing:

The execution of automated tests is substantially faster after the initial time spent creating test scripts. Test scripts cannot be forgotten after they have been produced and uploaded to the test suite, however manual testers may forget to complete some tests. Furthermore, automated tests are more accurate than manual tests since they are free of human mistake. As a result, businesses have discovered that automated software testing is an essential component of successful software development initiatives. What makes automated testing so vital to today's software organisations is that they invest more money in Test Automation solutions. Automation Testing is used to quickly and regularly re-run test suites that were

previously conducted manually. It is beneficial to both developers and testers. Companies prefer "Automation Framework" for automation testing. The tester's main goal is to uncover all possible flaws in the software and report them to the developer so that the product's quality can be improved. When it comes to client happiness, software quality becomes critical. A company's top priority should be to provide a high level of customer satisfaction.

## 2. Methodology:

Selenium Framework is a free, open-source test automation framework that is required for automation testing. Selenium is a set of software tools that have a unique manner of automating tests. It can manage operations across multiple operating systems and browsers. It supports a variety of programming languages, including Groovy, Ruby, Perl, Python, Java, C, and PhP, to name a few. Selenium is made up of several parts, the most important of which are three tools. Everyone has a part in making test automation for a web application a success.

- Selenium IDE (Integrated Development Environment): Selenium IDE is an integrated development environment for writing Selenium test cases. Selenium IDE is a Firefox add-on that lets testers record their actions as they go through the process they're testing.
- Selenium RC is a Client-Server Architecture that receives Selenium Commands from the editor and performs tests in the browser. It generates more complicated tests by utilising the full capabilities of programming languages such as

Java, C, PHP, Groovy, Python, Ruby, and PERL.

- Selenium Web Driver: The heir to Selenium RC, Selenium Web Driver gives commands to the browser and returns results.
- Selenium Grid: Selenium Grid is a tool that allows you to perform parallel tests on multiple machines and browsers at the same time, resulting in a faster execution time.

Web applications, in comparison to desktop systems, require additional modifications, such as system updates, security assaults, and user preferences. Companies cannot afford to apply regression testing to a system as a whole since the expected turnaround time for patches is low. They offered a solution to this problem when businesses are confronted with security breaches. In this case, regression testing is only applied to the code that has been changed. Selenium is a browser automation tool that is often used for developing web application end-to-end tests. A browser automation tool does exactly what it says it would do and automates browser control so that repetitive chores can be automated. It contains a variety of characteristics that are beneficial to developers.

## 3. Framework:

In a software test plan, it is impossible to automate every test case. The testers must first identify which tests need to be automated. As a result, testers must first determine which tests will be automated. All GUI elements, database connections, validations, and other tasks can be automated. When selecting whether or not to automate testing, the following variables are taken into account: Products that necessitate repeating the same tests over and over. Product specifications do not change regularly.

Languages like Java, vbscript, and automated software tools can be used to automate processes. A number of tools are available to assist with test automation.

Frameworks come in a variety of shapes and sizes:

- Linear Structure—This is the most basic and basic framework. A single programme was built for successive stages in a test script. There is no modularity.
- Data driven Framework - This type of framework is used to test the behaviour of an operation using a variable collection of data.
- Keyword-driven Framework—Keyword-driven GUI provides a list of keywords that are used to create test cases. Some arguments or values may be required in order to utilize the keyword. Each keyword has its own set of arguments, which can be either a static value or a value from a data table.

#### 4.Conclusion:

The concept of testing and several testing methodologies were introduced in this study. It will assist you in comprehending the significance of test automation. The purpose of an automation testing procedure is to assist in the testing of software programme applications.

There were several web automations tools available, ranging from HP-QTP to Selenium. Our study paper focuses on giving a review of all web test automation solutions, and as a result, it serves as a reference for future Selenium researchers. Before choosing a tool, testers must compare the features of numerous tools and select the best one for the job. It is a review of all web

test automation tools and thus serves as a reference for future Selenium researchers. Before when choosing a tool, testers must weigh the pros and cons of several options before deciding on the best one.

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