

B.M.S College of Engineering

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DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING



**Course – Software Testing
Course Code – 20IS6PCSTG
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MANUAL AND AUTOMATION TESTING

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C E R T I F I C A T E

This is to certify that the presentation entitled “**MANUAL AND AUTOMATION TESTING**” is a bona-fide work carried out by by **Samartha S** bearing USN: **1BM19IS219**, in partial fulfillment of the requirements for the VI Semester degree in **Bachelor of Engineering in Information Science & Engineering** of **Visvesvaraya Technological University, Belgaum** as a part of for the course **Software Testing, Course Code - 20IS6PCSTG** during academic year 2021-2022.

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INTRODUCTION

Software Testing is a method to check whether the actual software product matches expected requirements and to ensure that software product is defect free. It involves execution of software system components using manual or automated tools to evaluate one or more properties of interest. The purpose of software testing is to identify errors, gaps or missing requirements in contrast to actual requirements

Software Testing is important because if there are any bugs or errors in the software, it can be identified early and can be solved before delivery of the software product. Properly tested software products ensure reliability, security and high performance which further results in time saving, cost effectiveness and customer satisfaction.

The process of software testing aims not only at finding faults in the existing software but also at finding measures to improve the software in terms of efficiency, accuracy, and usability. It mainly aims at measuring the specification, functionality, and performance of a software program or application.

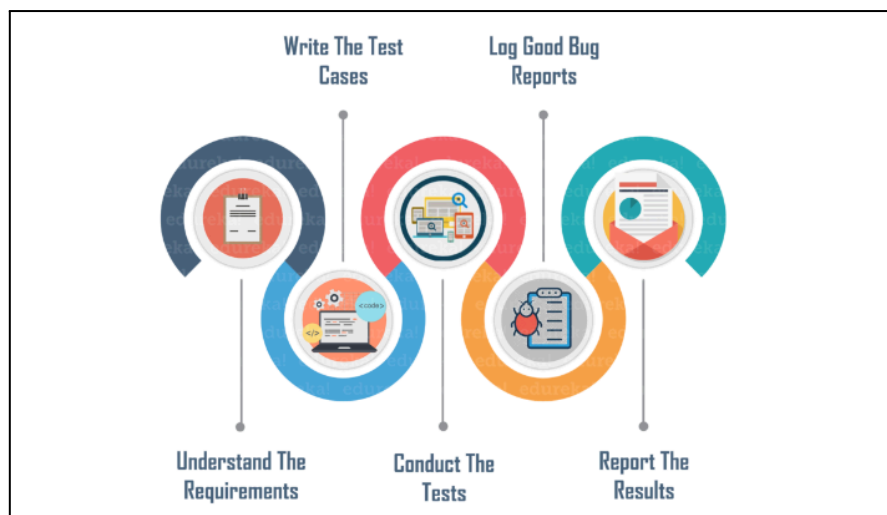
MANUAL TESTING

It is a software testing process in which test cases are executed manually without using any external tool. The tester will manually execute test cases based on the end user's perspective. By manually testing an application we can determine whether the application is working as per the mentioned requirements or not. Test cases are executed and implemented completely manually. Even the test reports are generated manually. Manual testing requires great time and effort, yet it gives the guarantee of bug-free software.

Manual Testing is one of the most fundamental testing processes as it can find both visible and hidden defects of the software. The difference between expected output and output, given by the software, is defined as a defect. The developer fixed the defects and handed it to the tester for retesting. Manual testing is mandatory for every newly developed software before automated testing.

Steps involved in manual testing:

1. Understanding the requirements
2. Writing the test cases
3. Conducting the tests
4. Finding and logging the defects/bugs
5. Report the results



TYPES OF MANUAL TESTING

1. **White Box Testing:**

The white box testing is done by the Developer, where they check every line of a code before giving it to the Test Engineer. Since the code is visible for the Developer during the testing, that's why it is also known as White box testing. It examines the software's functionality without peering into its internal structure and coding.

2. **Black Box Testing:**

The black box testing is done by the Test Engineer, where they can check the functionality of an application or the software according to the customer /client's needs. In this, the code is not visible while performing the testing; that's why it is known as black-box testing. It is used to test the internal coding and infrastructure of the software. It focuses on the checking of the predefined input against expected output.

3. **Gray Box Testing:**

Gray box testing is a combination of white box and Black box testing. It can be performed by a person who knows both coding and testing. And if the single person performs white box, as well as black-box testing for the application, it is known as Gray box testing.

MANUAL TESTING TOOLS

Some of the most popular manual testing are:

1. JIRA
2. LoadRunner
3. Citrus
4. NUnit
5. BugZilla
6. Mantis

JIRA Tool

It is a manual testing tool that connects directly with code development environments, which makes it ideal for developers as well. Because it is capable of tracking almost any kind of problem, it is not limited to the software sector. It is compatible with agile projects. JIRA is a software testing tool developed by the Australian Company Atlassian. It is a bug tracking tool that reports all the issues related to your software or mobile apps.

JIRA tool is used because of the following reasons:

- **Plan, Track and Work Faster**

JIRA is a bug-tracking tool mainly used to track, organize, and prioritize the bugs, newly added features, and improvements for certain software releases. Projects are subdivided into issues and issues can be of multiple types such as bug, new feature, improvement, and documentation tasks.

- **The main source of information**

JIRA is the primary source of information for the next software release. On JIRA, the whole team of the software developers can plan for the new features which are to be added and bugs to be fixed in the next release.

- **Track the progress of our documentation**

It is a very useful tool in tracking the progress of our documentation. The JIRA tool provides a very important feature, i.e., pie chart macro. In the pie chart macro, you can view tasks such as Open tasks, Closed tasks, Resolved tasks.

ADVANTAGES AND DISADVANTAGES OF MANUAL TESTING

Advantages:

1. **Accurate:** Automated tools are smart, but they're not as smart as humans. There are certain things that only a real person with real-world experience can spot.
2. **Gives human insight:** Manual software testers bring a valuable human perspective as well as accuracy, depending on the look and feel of a product.
3. **Adaptable:** The manual method is particularly useful in ad-hoc testing, as it's easily adaptable when unplanned changes are made to software.
4. **Inexpensive:** Although manual testing requires skilled labor, it can actually save your company money as it doesn't need any expensive tools.

Disadvantages:

1. **Resource-heavy:** Manual testing is undeniably more time-consuming than automation, which means the testing process is slower and can sometimes be more costly.
2. **Not always suitable:** Certain types of testing, such as performance and load testing, are not suited to manual methods.
3. **Potential for error:** Humans are smarter than machines in many ways, but they're also prone to human error.
4. **Not reusable:** As the manual testing process can't be recorded, manual tests are not reusable you'll need to develop separate test cases for each new application.

AUTOMATION TESTING

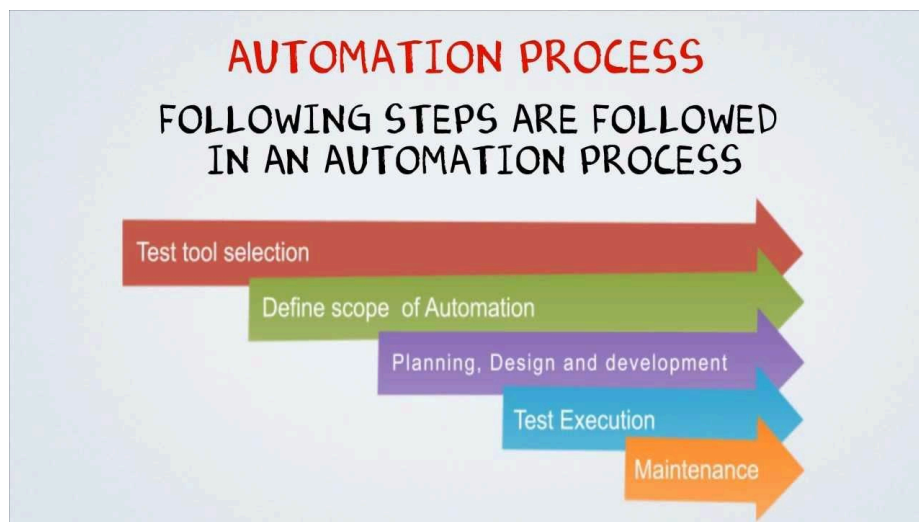
Automation Testing is a software testing technique that performs using special automated testing software tools to execute a test case suite. On the contrary, Manual Testing is performed by a human sitting in front of a computer carefully executing the test steps.

The automation testing software can also enter test data into the System Under Test, compare expected and actual results and generate detailed test reports. Software Test Automation demands considerable investments of money and resources.

Successive development cycles will require execution of the same test suite repeatedly. Using a test automation tool, it's possible to record this test suite and re-play it as required. Once the test suite is automated, no human intervention is required.

Steps involved in Automation Testing:

1. Selecting the test tool
2. Defining the scope of automation
3. Planning, designing and developing the test cases
4. Executing the test cases
5. Maintenance



AUTOMATION TESTING TOOLS

Some of the most common automation testing tools are:

1. Selenium
2. Katalon Studio
3. Appium
4. TestComplete
5. LambdaTest

Selenium

Selenium is an open-source, automated, and valuable testing tool that all web application developers should be well aware of. A test performed using Selenium is usually referred to as Selenium automation testing. However, Selenium is not just a single tool but a collection of tools, each catering to different Selenium automation testing needs.

Feature of Selenium:

1. Multi Browser Support:

Selenium is capable of interacting with web apps and the web elements in a browser just like a real user would. Selenium does that by using a browser native support that makes direct calls without the use of any intermediary device or software. Almost all browsers are supported by Selenium – Chrome, Safari, IE, Opera, Edge, and Firefox.

2. Multi language compatibility:

Selenium supports almost all programming languages like PHP, Java, Python, JavaScript, Perl, Ruby, etc. You can write automation test scripts using any programming language you feel comfortable with. You can also use switch statements, conditional statements, or decision-making statements to enhance your automation test script.

3. Easy Identification and Use of Web Elements:

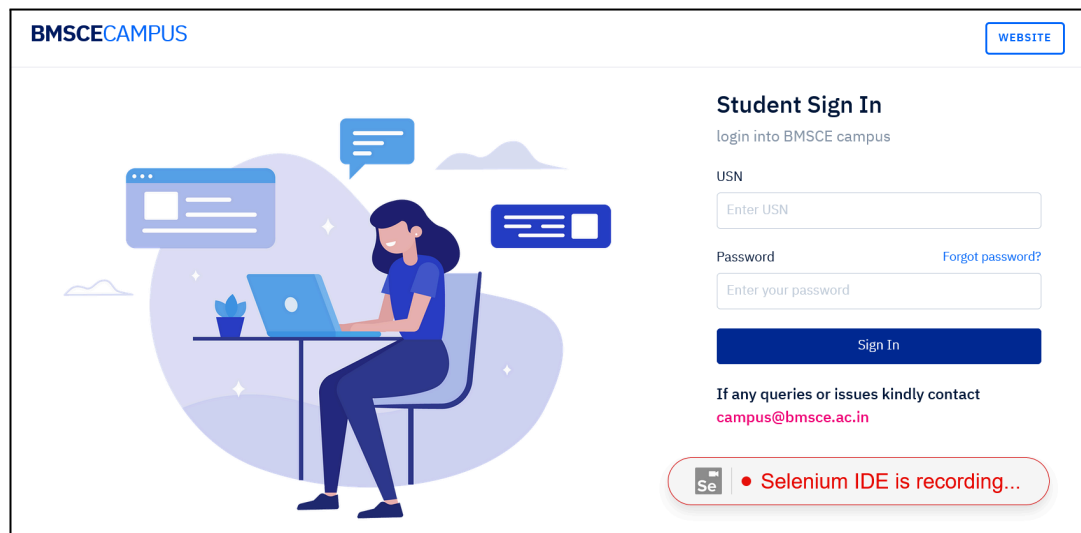
Selenium makes it easy to identify web elements on the web apps with the help of its several locators. This makes the implementation of the elements much easier in the test automation suite.

4. Performance and Speed

Selenium has a particular component for the automation of web app testing called WebDriver. This tool is able to execute test cases quicker than the other tools. It is capable of communicating directly with the browser so there is no requirement for intermediaries like the server.

Selenium in action

Recording the test :



Test Log File:

https://webcampus.bmsce.in/student			
	Command	Target	Value
1	✓ open	https://webcampus.bmsce.in/student	
2	✓ set window size	1136x672	
3	✓ click	id=usn	
4	✓ type	id=usn	1BM19IS219
5	✓ click	id=password	

ADVANTAGES AND DISADVANTAGES

OF AUTOMATION TESTING

Advantages:

1. **Increased accuracy:** When tests are automated, they run more frequently and with greater consistency than when running tests manually. This can be beneficial when dealing with a large codebase or when new features are added.
2. **Faster execution:** Automated testing can also lead to faster execution of tests. This is because the tests will run concurrently instead of serially. Running tests concurrently means more tests run in a shorter amount of time.
3. **More trustworthy results:** Another benefit of automated testing is that it can lead to more reliable results. This comes as a result of the fact that tests are run automatically and with greater frequency. Automated software testing helps you quickly identify any issues or regressions on your application, making it easier for you and your team to address these problems as soon as they arise.
4. **Increased efficiency:** Automated testing can help improve developer productivity by automating tasks that would otherwise have to be done manually.

Disadvantages:

1. **Complexity:** Automated tests can take longer to develop than manual tests, especially if they are not well designed. They can also be more challenging to implement into your development workflow.
2. **High initial costs:** One of the main drawbacks of automated testing is that it initially takes a significant amount of time and money to implement. However, this investment can often be recouped very quickly in terms of improved developer productivity and more trustworthy results.
3. **Cannot be used on GUI elements:** While automated tests can be used to test most functionality of your application, they are not suited to testing things like graphics or sound files. This is because computerized tests typically use textual descriptions to verify the output. Therefore, if you try using an automated test on a graphic or audio file, it will likely fail every time, even if the content appears correct.

MANUAL TESTING vs AUTOMATION TESTING

	Manual Testing	Automation Testing
Investment on	Human resources since humans test the software	Automation testing tools as the testing is performed by various automated tools
User-friendliness	It checks for user friendliness	It cannot guarantee user friendliness
Programming Knowledge	Not required	Required
Test Case Coverage	Difficult to ensure complete test coverage	Ensures greater coverage of test cases
Time Consumption	Consumes more time	Consumes less time

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