ĐẠI HỌC ĐÀ NẴNG
TRƯỜNG ĐẠI HỌC CÔNG NGHỆ THÔNG TIN VÀ TRUYỀN THÔNG VIỆT - HÀN
Vietnam - Korea University of Information and Communication Technology

Software Testing

Chapter 5
Test Automation and Tools

Contents

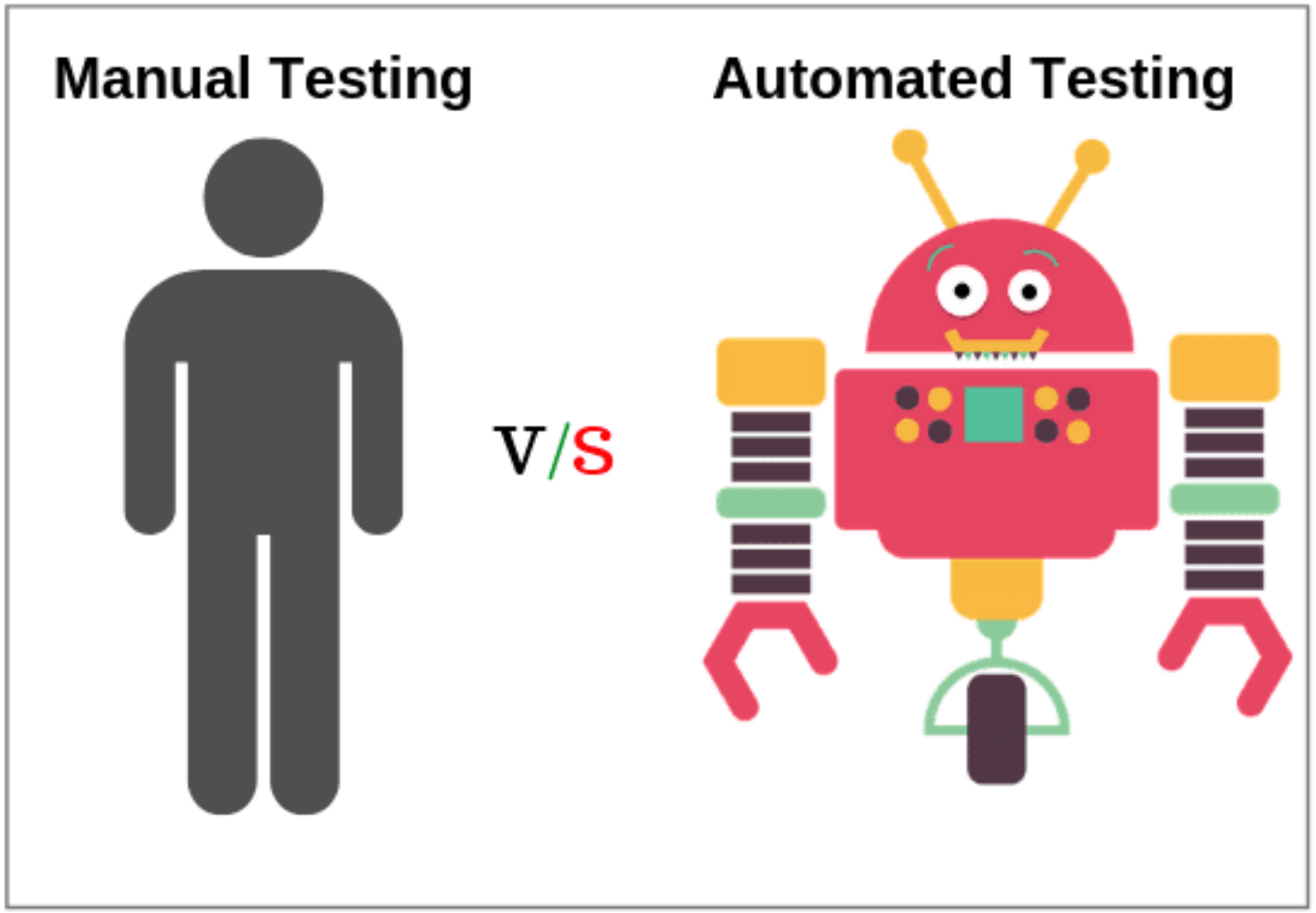
1.What is Test Automation?

- Test Automation/Automated testing uses the assistance of tools, scripts, and software to perform test cases by repeating pre-defined actions.
- It completely depends on the pre-scripted test which runs automatically and compares the actual results with expected results

1.What is Test Automation?

- Why automated testing?
  - No human intervention is required.
  - Testing multilingual sites
  - Increases speed of test execution
  - Increases test coverage
  - Manual testing becomes time consuming, costly and error prone

What is Test Automation?



2. Advantage and disadvantage of automation testing?

- Advantages:
  - save time and money: running tests 24/7, fewer Human resources
  - Automation does what manual testing cannot: Volume, Reusable
  - Improves reliability of the test
  - Reduces maintenance cost of testing
  - Increases amount of test coverage
  - Eliminates the need to do boring takes

2. Advantage and disadvantage of automation testing?

- Disadvantages:
  - Test Automation requires lot of efforts at initial stage.
  - Programming Knowledge is required.
  - Debugging issues: use programming syntax/logic to write Tests, some times locating errors in Test Script is difficult.
  - Test Tools have Environment Limitations.
  - All types of Testing not possible (ex: usability)

3. When to use Manual and automatic testing

When to use Manual Testing

Manual testing allows for human observation, which may be more useful if the goal is user-friendliness or improved customer experience

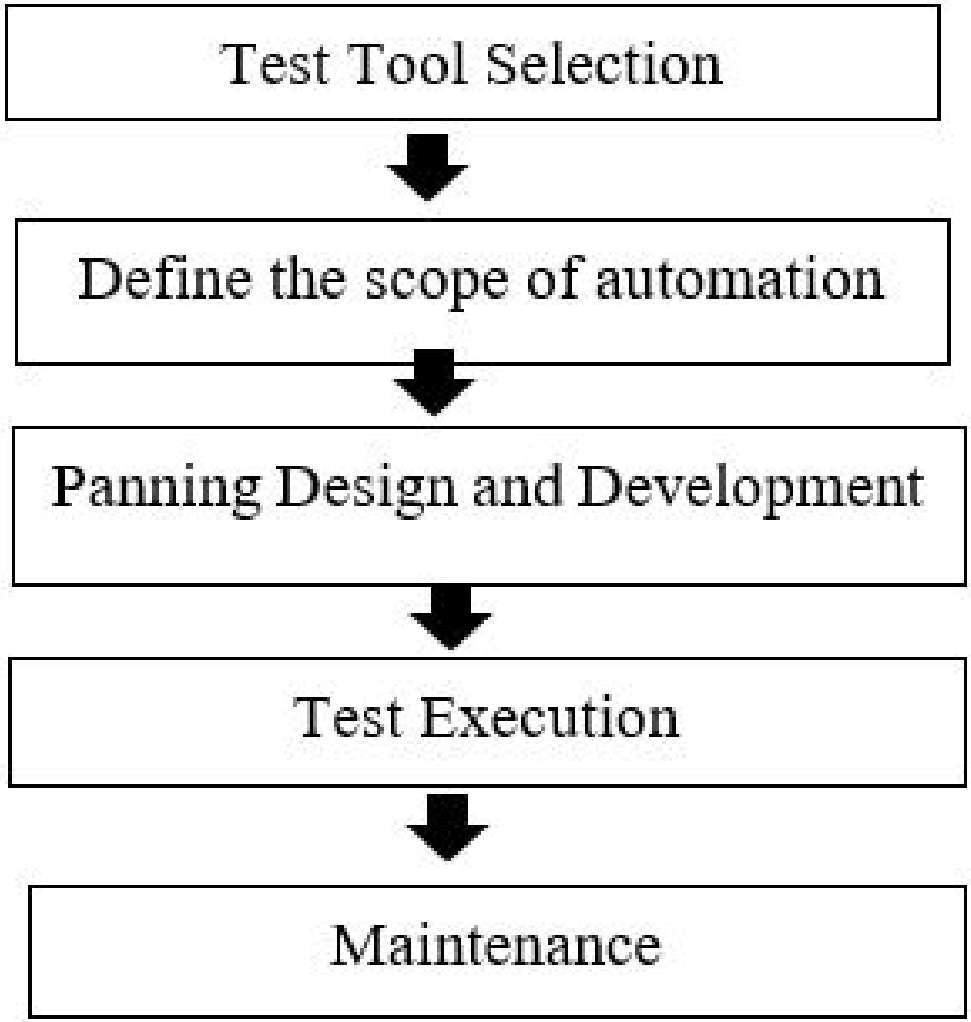
- Exploratory Testing
- Usability Testing
- Ad-hoc Testing

When to use Automatic Testing

Automated testing is a practical option when the test cases are run repeatedly over a long time period.

- Regression Testing
- Load Testing
- Repeated Execution
- Performance Testing

4. Automation Test Process



4.1 Test tool selection

- The following parameters should be considered before selection of appropriate tool to be used for Test Automation:
  - Data driven/Test driven/Behavior driven capabilities
  - Hybrid framework
  - Debugging and logging capabilities
  - Platform independence
  - Extensibility and Customizability
  - ….

4.2 Scope of Automation

- Scope of automation defines the area covered under automation for a software/application
- Following points help to determine this scope:
  - Features which are crucial for the business
  - Scenarios/workflows covering tests which have a large amount of data
  - Common functionalities across applications
  - Technical feasibility
  - Reuse business components
  - Complexity of test cases

4.3 Planning, Design and Development

- During this phase one creates an automation strategy and plan, which contains the following details:
  - Selecting appropriate automation tools
  - Creating the framework design and its features
  - Identifying In-scope, and Out-of-scope items of automation
  - Automation test bed preparation
  - Timeline for test case automation
  - Scheduling execution of automation suites
  - Deliverables of Automation testing

4.4 Test Execution

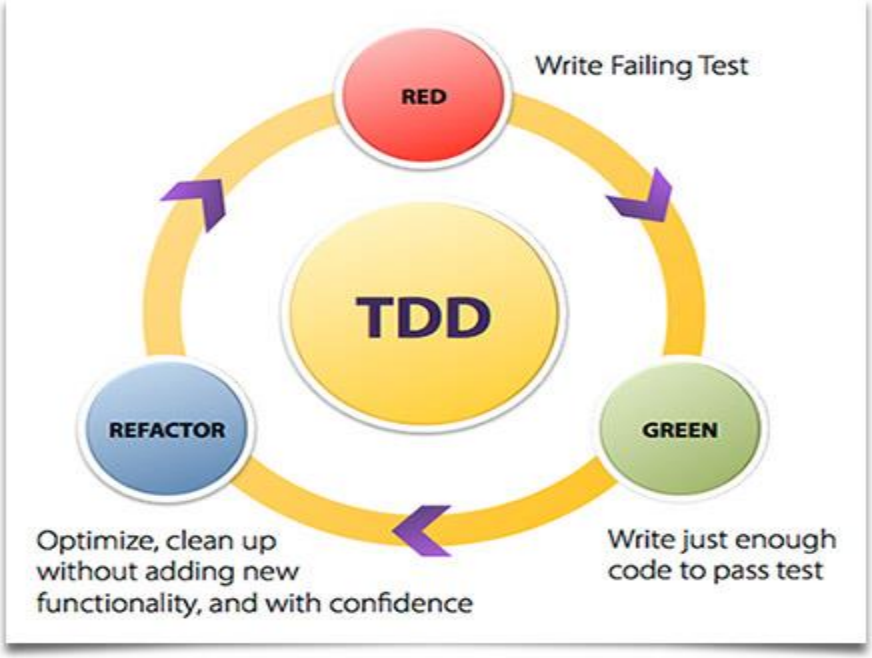
- Automation scripts are executed during this phase
- Test suite automation run could be directly executed from the automation tool or indirectly from a Test Management tool which will redirect the invoke request to the automation tool
- Automation tool could execute the automation suites either on a single machine or distribute the suites on several machines to achieve faster results.

4.5 Maintenance

- Since new functionalities are added with successive cycles, Automation scripts require update and also need to be reviewed and maintained for each release cycle.
- Maintenance is necessary to make sure that the Automation scripts are in a stable state.

5. Test Driven Development (TDD) approach

- It is an evolutionary approach to development which combines test-first development where you write a test before you write just enough production code to fulfill that test and refactoring



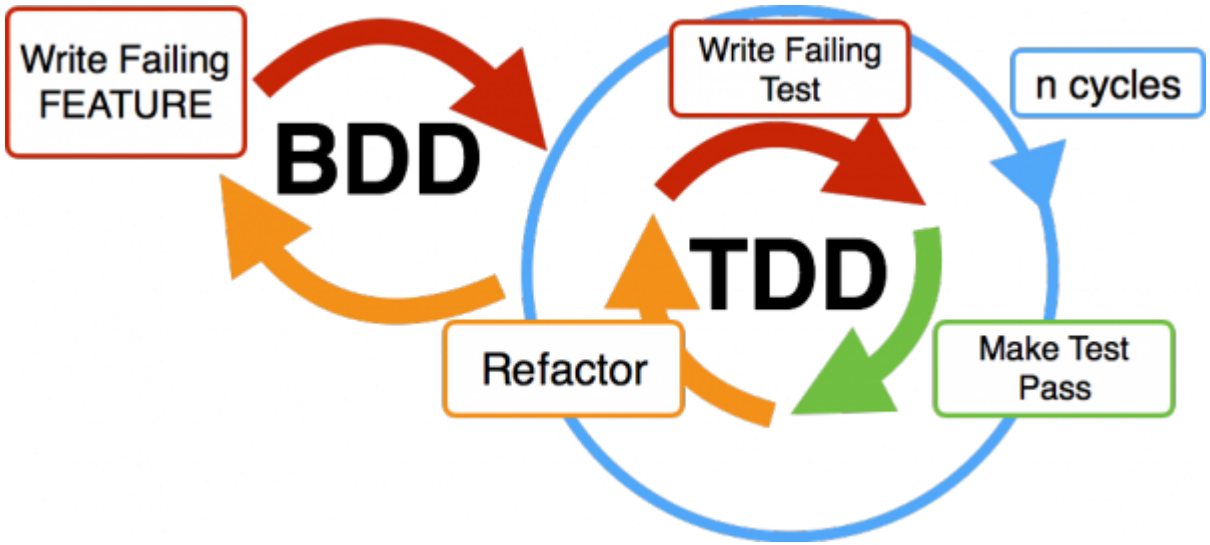
5. Test Driven Development (TDD) approach

- RED – The developer writes a failing test essentially capturing the requirements in a test
- GREEN – The developer implements the business functionality, writing just enough code to pass the test
- REFACTOR – The developer refines and improves the code without adding new functionality.

=>Demo.

5. Behavior Driven Development (BDD) approach

- BDD is a technique in which developers, testers, business representatives work together to analyze the requirements of a software system, formulate them using shared language (Gherkin) and verify them automatically.



5. Behavior Driven Development (BDD) approach

- TDD relies on unit tests to verify implementation details whereas BDD relies on executable scenarios to verify behaviors and more.
- BDD follows a prescribed path:
  - Create user stories collaboratively
  - Formulate user stories as executable scenarios and verifiable behavior
  - Implement behaviors and execute the scenarios to verify them

5. Behavior Driven Development (BDD) approach

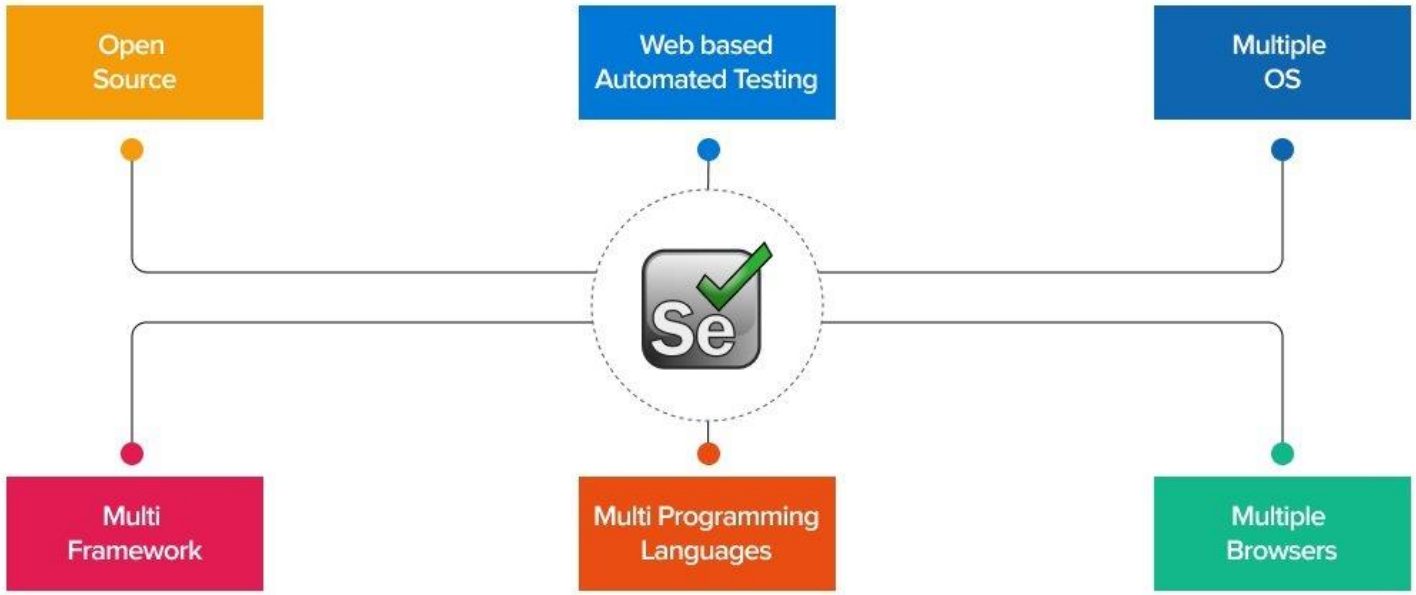
- BDD scenarios are typically composed of three main sections:
  - Given – describes the state of the environment (preconditions) before the behavior is triggered
  - When- describes the actions that trigger the behavior
  - Then – describes the expected results of the behavior

=>Demo

6. Common Automation Test tool

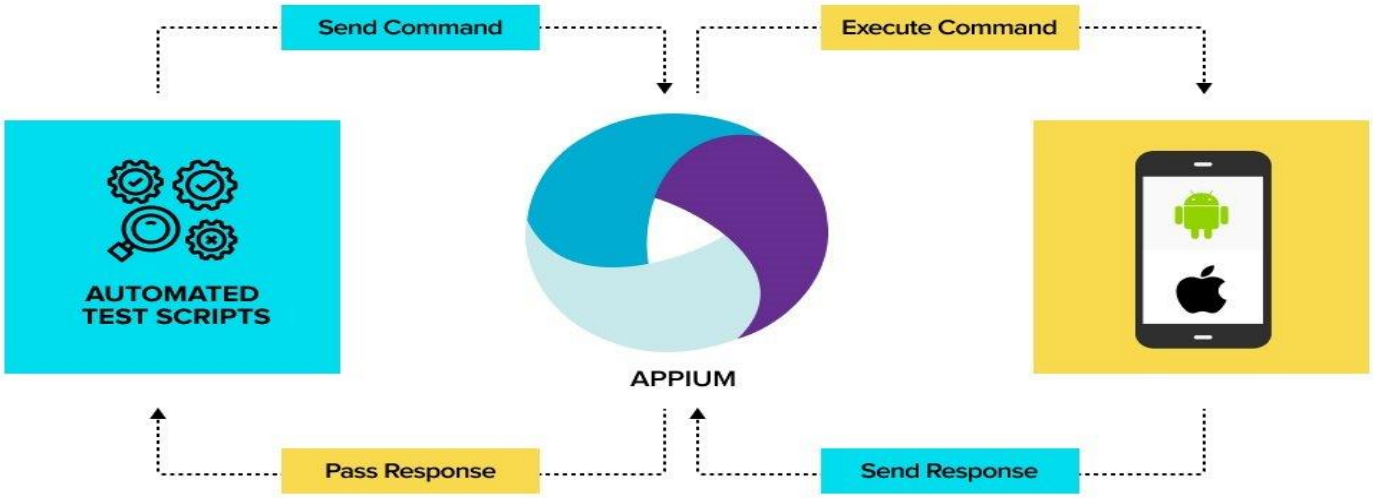
❖Selenium:

- a testing tool for automating web application testing



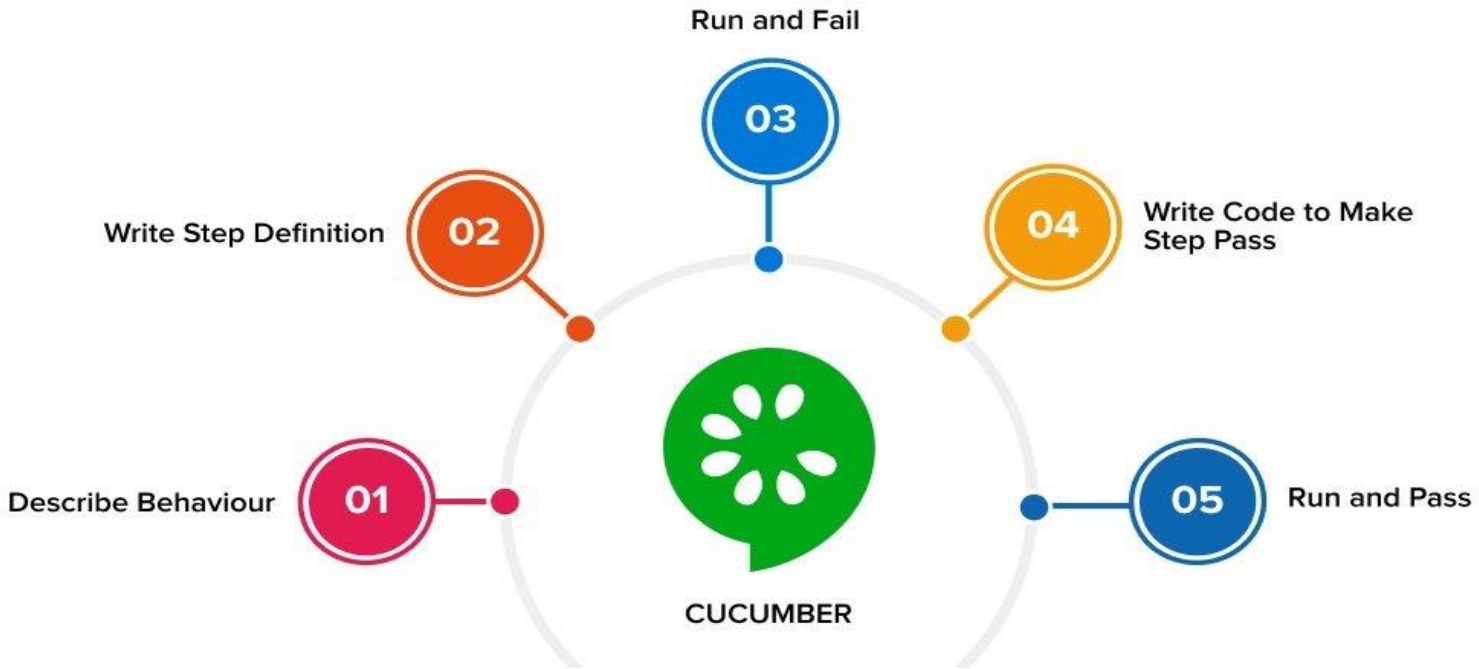
6. Common Automation Test tool

- Appium:
  - is one of the open-source automated testing tools primarily intended for mobile applications.
  - It backs automation of native, hybrid, and mobile web applications built for iOS and Android.



6. Common Automation Test tool

- Cucumber
  - is an open-source Behavior Driven Development (BDD) tool
  - supports only the web environment



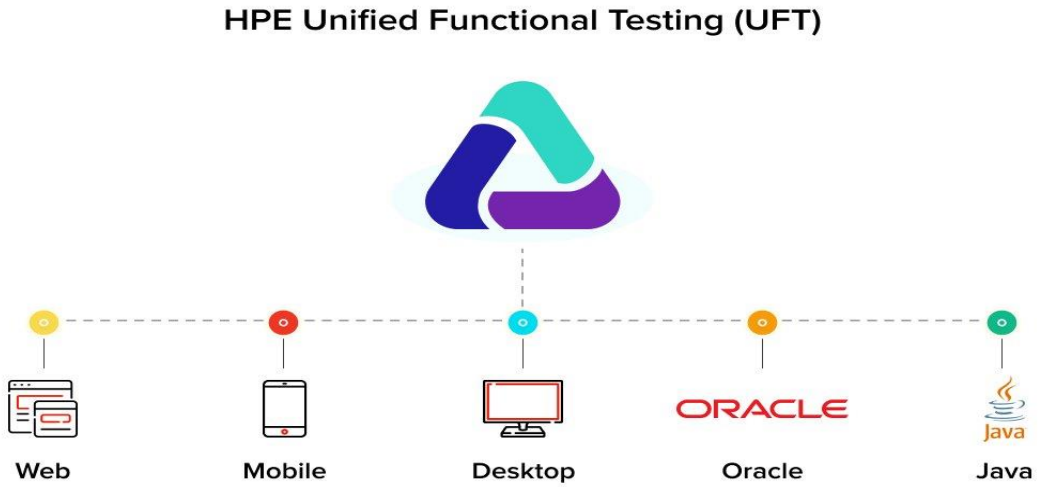
6. Common Automation Test tool

❖ Katalon Studio

- is an open-source and commercial test automation solutions.
- Automate Web (UI and API) and mobile applications.
- It can be integrated with a variety of other tools such as JIRA, qTest, Kobiton, Git, Slack, and more.

6. Common Automation Test tool

- Unified Functional Testing (UFT)
  - is known as QuickTest Professional (QTP)
  - Automate Web (UI and API), Desktop, mobile applications.
  - Only for Windows



6. Common Automation Test tool

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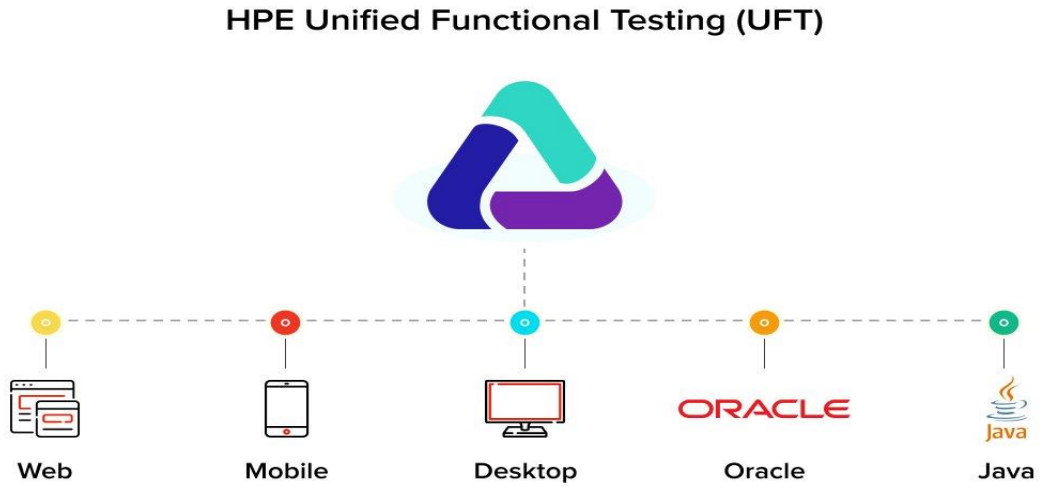

7. How to Choose an Automation Tools?

- Environment support
- Ease of use
- Object identification
- Scripting language used
- Support for various types of test – including functional, test management, mobile,..
- Error recovery testing
- Multiple framework support
- Minimize cost
- Extensive test reports and cost.

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Thank You !