SOFTWARE TESTING CONCEPTS

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SOFTWARE TESTING ???

"Software testing is a way to assess the quality of the software and to reduce the risk of software failure in operation."

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.

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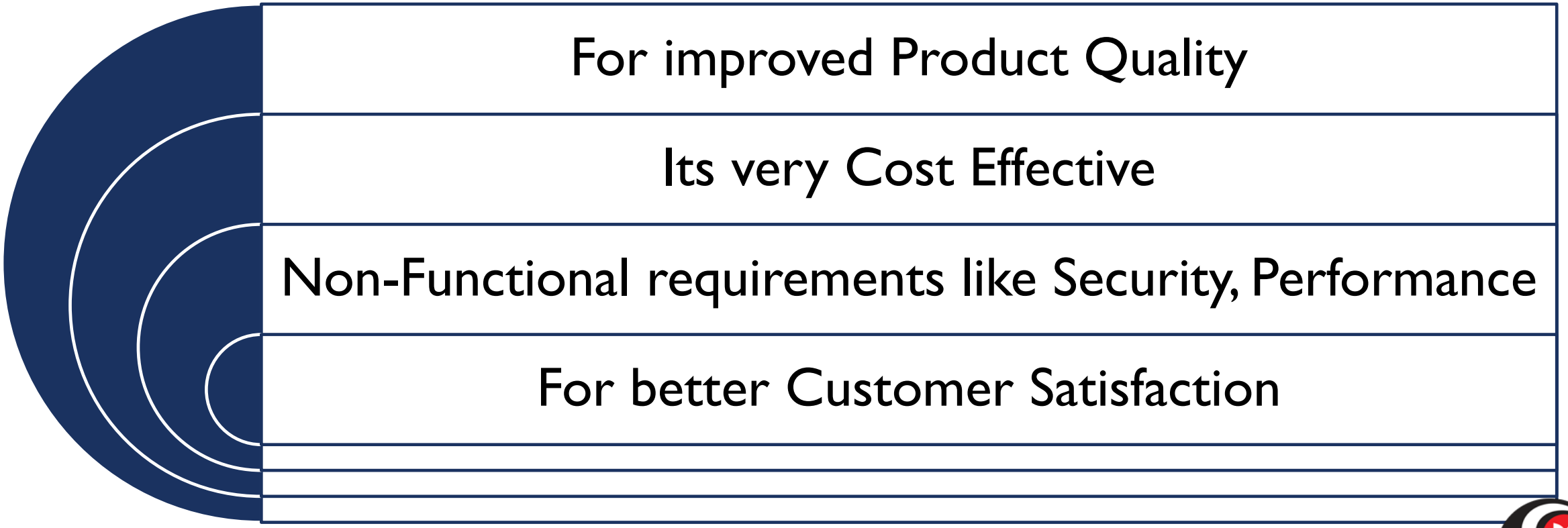
WHY WE NEED TO TEST?



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QUALITY MANAGEMENT

Quality Assurance is **static testing**. In other words, it comes under "Verification" with the primary purpose of the prevention of defects

Quality Control is **dynamic testing**. In other words, it comes under "Validation" with the primary purpose of the identification of defects

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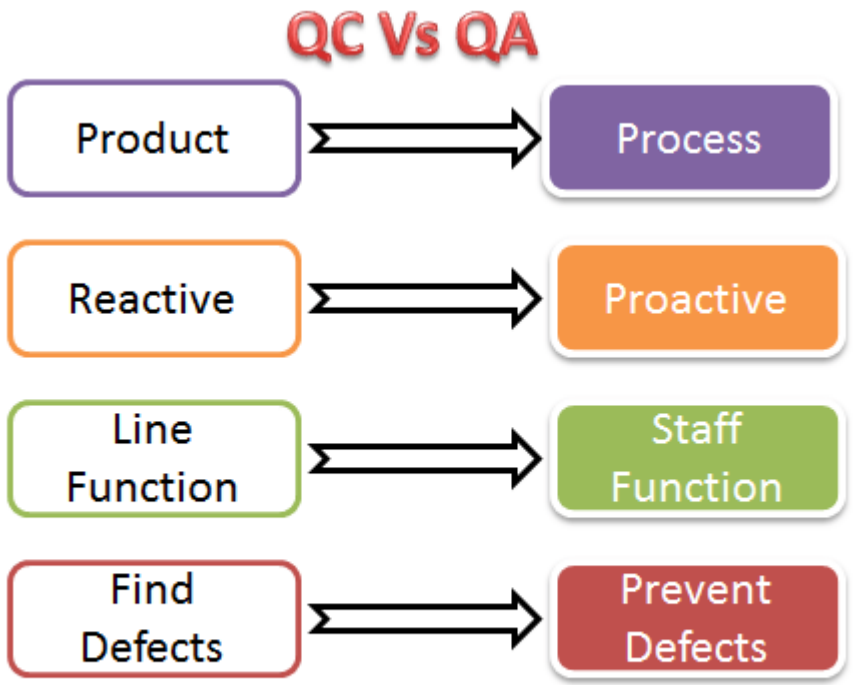
QUALITY ASSURANCE VS QUALITY CONTROL



Quality Control Vs Quality Assurance

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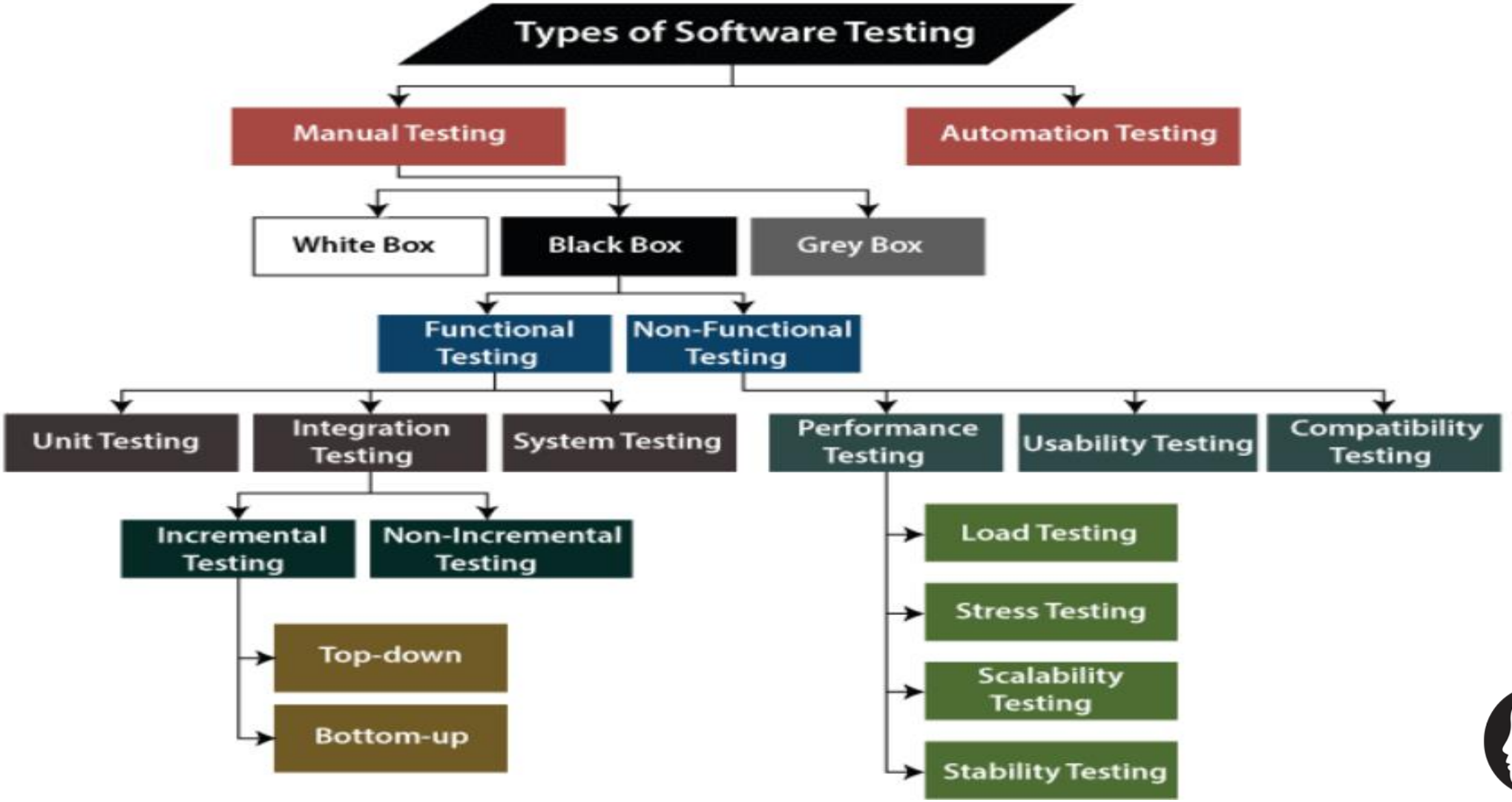
COMMON INTERVIEW QUESTIONS

- Quality Assurance vs Quality Control
- Difference Between Test Scenarios, Test Cases and Test Scripts.
- What are different Levels of Testing.
- What are different Types of Testing.
- Define Test Plan.
- Define UAT and its Types.
- Write Test Cases for an Application
- Defect Life Cycle
- Priority and Severity
- Automation Know how



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FUNCTIONAL AND NON-FUNCTIONAL TESTING

Posting a message on Facebook page

FUNCTIONAL	NONFUNCTIONAL
WHAT a system does	HOW *well* the system does it within design & resource constraints

No data leakage, Millions of users can access in parallel

Keeping the Actual User in Mind

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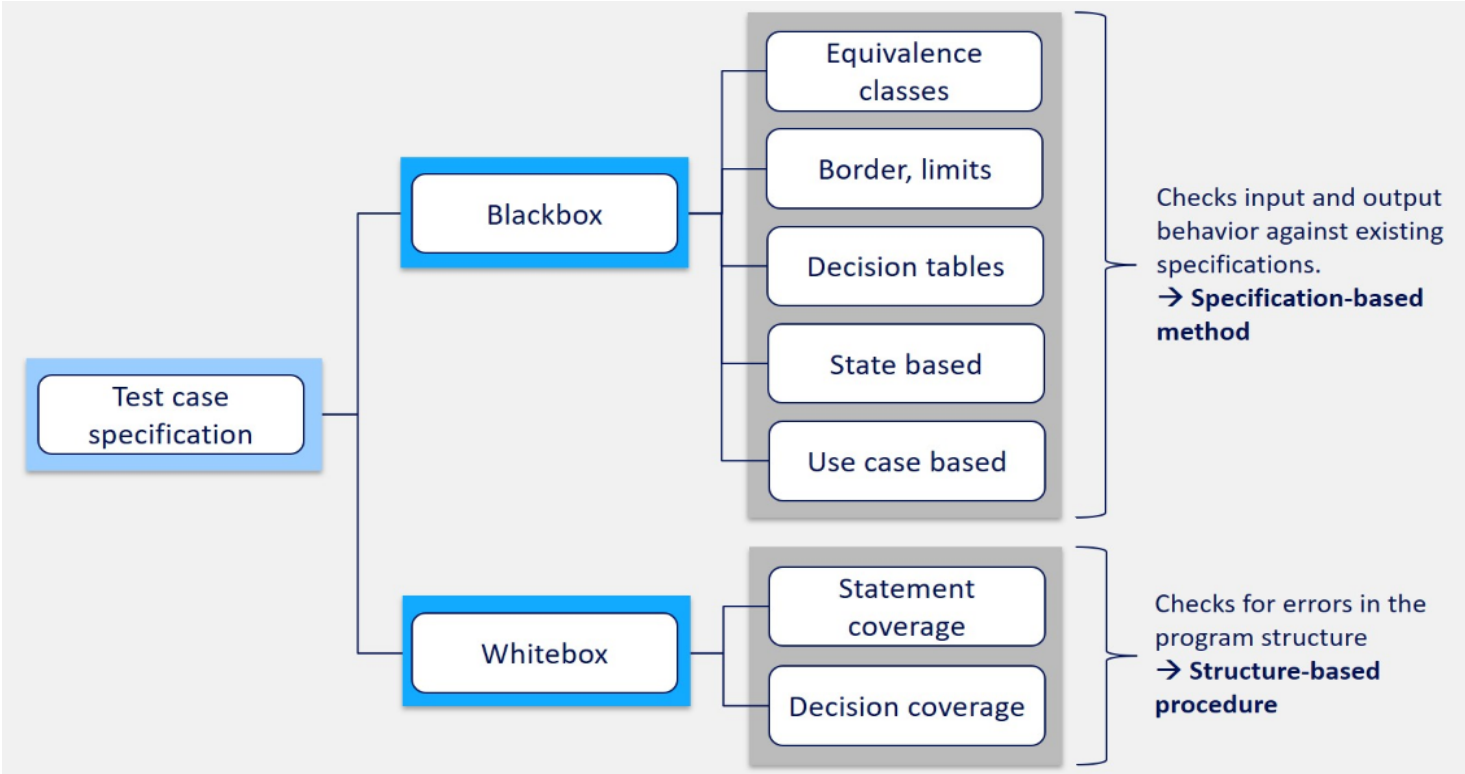
TESTING TECHNIQUES

- Equivalence Class Partitioning
- Boundary Values
- Use Case Based



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EXAMPLES OF TECHNIQUES

Use Case Based

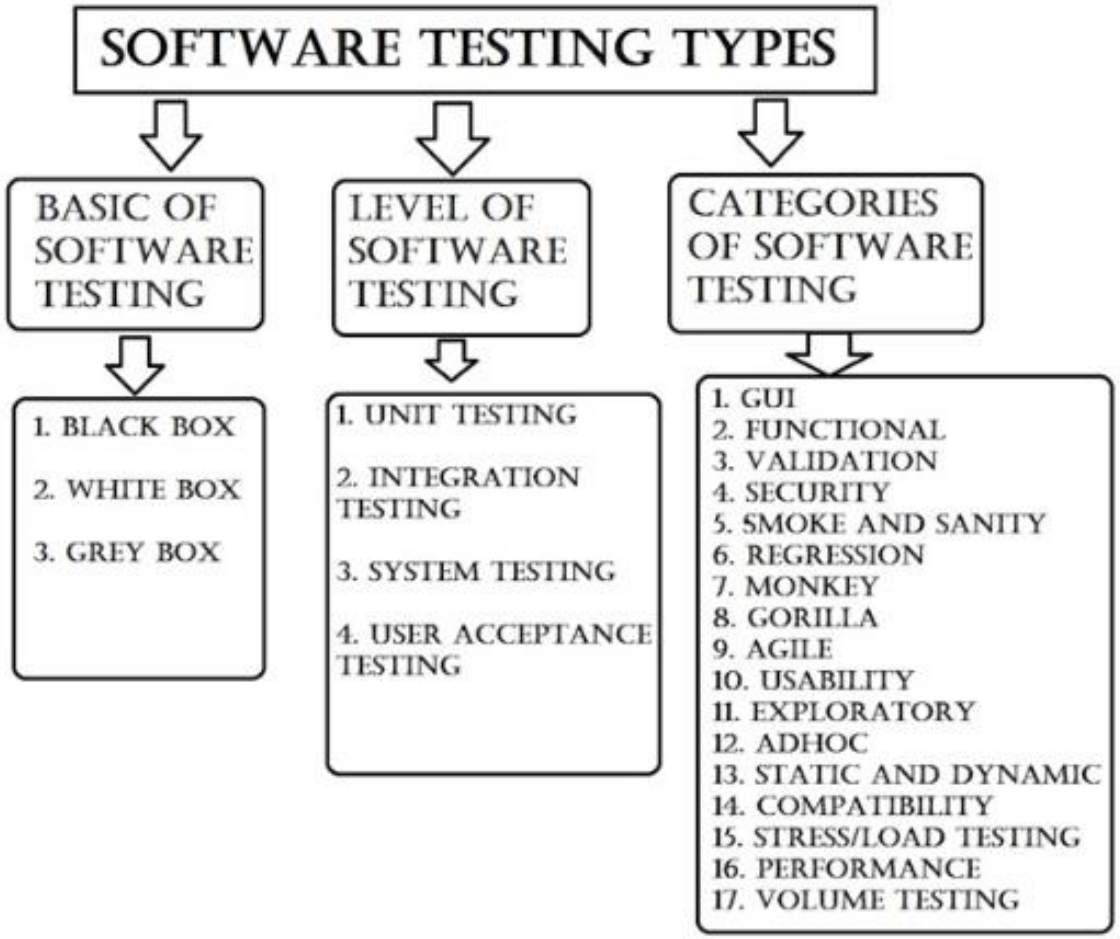
- Login
- Change Password
- Set FB Status
- ATM Transaction

Equivalence Class Partitioning

- Enter Age
- Credit Card Expiry Date
- ATM Transaction

Boundary Values

- Valid and Invalid Boundaries
- Invalid Boundary Check { Min-1 ; Max+1 }
- Valid Boundary Check {Min; Min+1 ;Max-1;Max }



TESTING CATEGORIES TO REMEMBER

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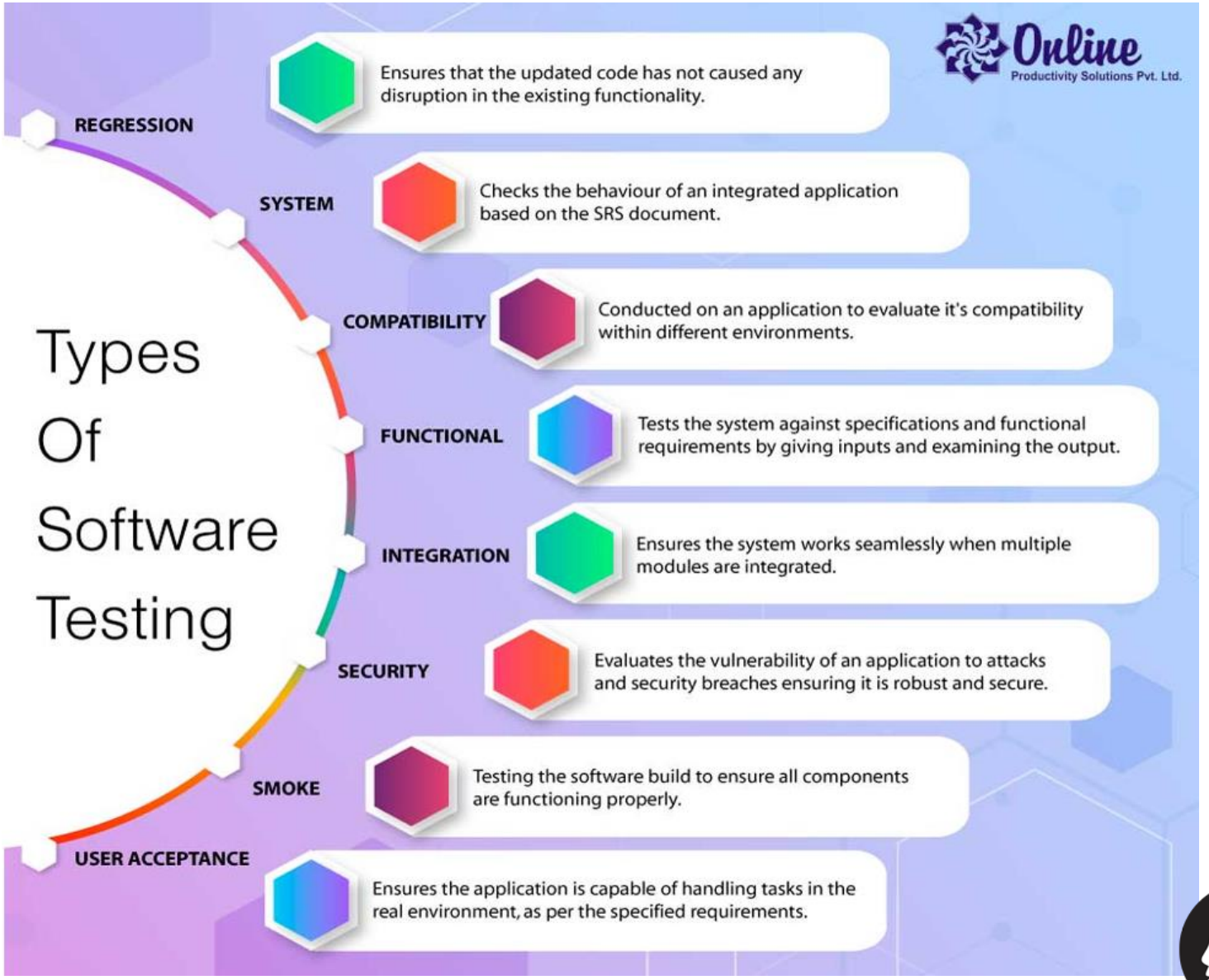
SOME COMMON TESTING TYPES…

- Regression
- Smoke
- Sanity
- User Acceptance Testing
- System Testing
- Security Testing
- Integration Testing
- Compatibility Testing



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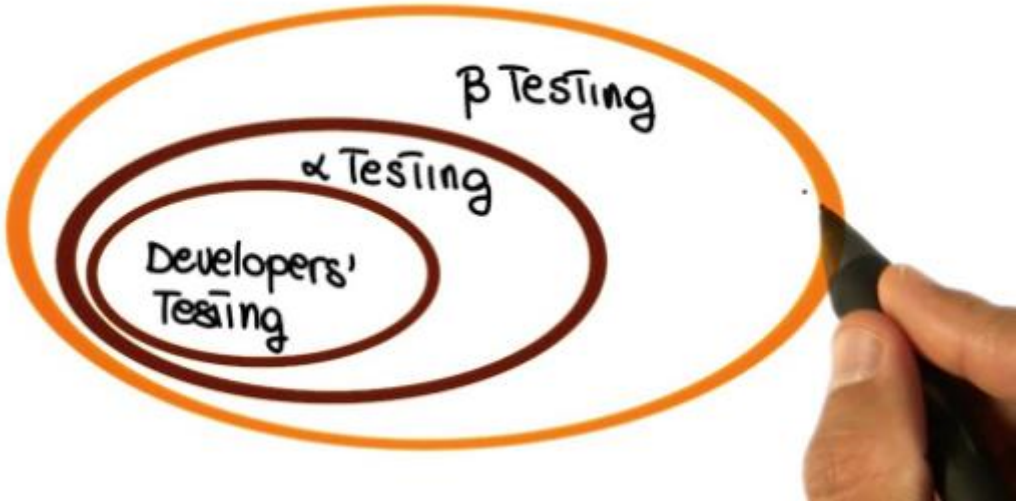
UAT TESTING TYPES



Alpha vs Beta

	Alpha	Beta
Main purpose	Test every user journey and ensure the **application is working as expected.**	Understand **how real users interact** with the application and test how it works in real-world conditions.
Done by	**Internal team**, potentially also end-customer.	**Joe Public.** Either via invite or via controlled release.
Visibility	**White box.** The testers know what is happening and what they are testing.	**Black box.** The testers just see the application and any associated help or tool-tips.
Structure	**Rigorously structured.** Every flow is tested and all results recorded and carefully analyzed.	**Completely unstructured.** Users are free to do what they want. Feedback is requested, but not required.
Performance	Not interested in how the application or backend performs, simply in **functionality.**	**Reliability and performance** are key aspects of beta testing. Along with application security and stability.
Post-test-actions	**Any bugs identified are fixed.** Any suggestions for small changes are analyzed and may be implemented. E.g. minor UI changes.	**Show-stopper bugs are fixed.** A/B testing may be conducted and result in a decision. But, in general, the results of feedback are used to influence the next version.
Duration	This can be a **long process**, however, you should aim to keep it as short as possible (to avoid delays with your release).	Usually, this is a **short process** lasting a few weeks. However, some companies run betas that last for many years.

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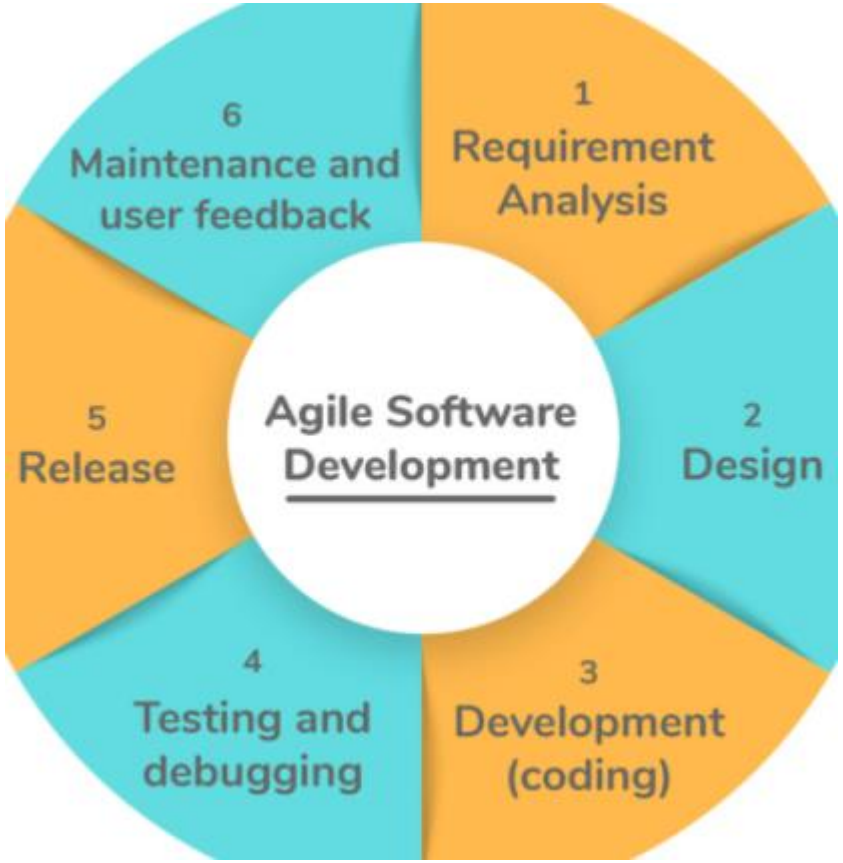
AGILE DEVELOPMENT LIFECYCLE



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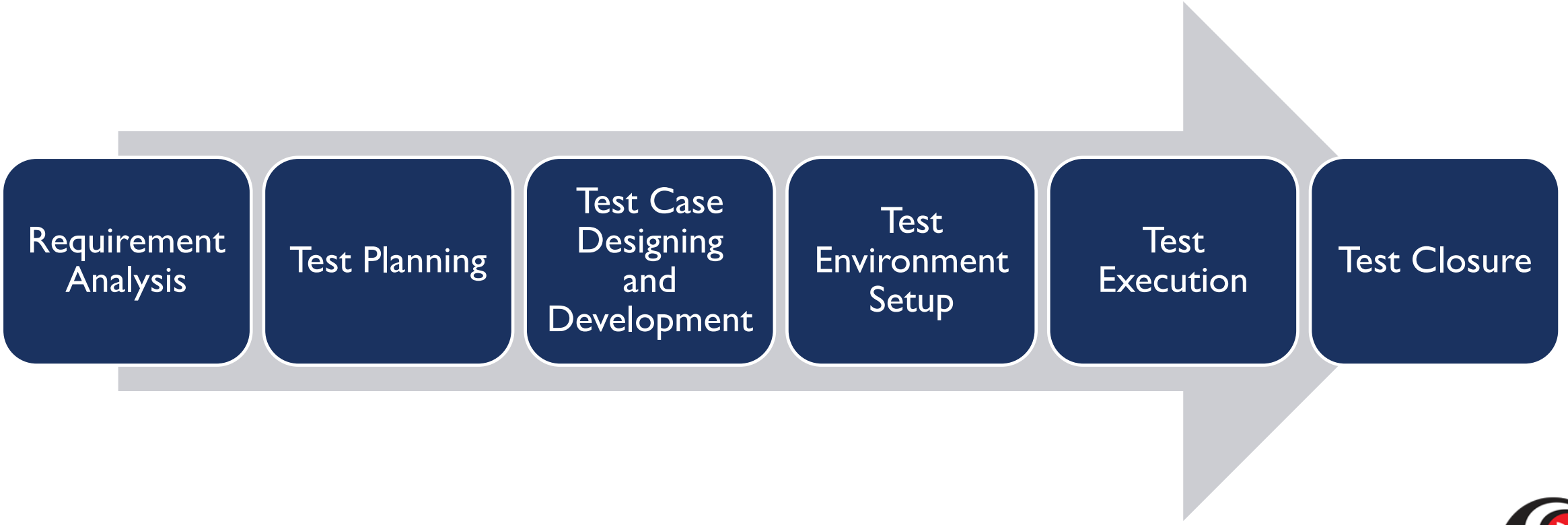
SOFTWARE TESTING LIFECYCLE



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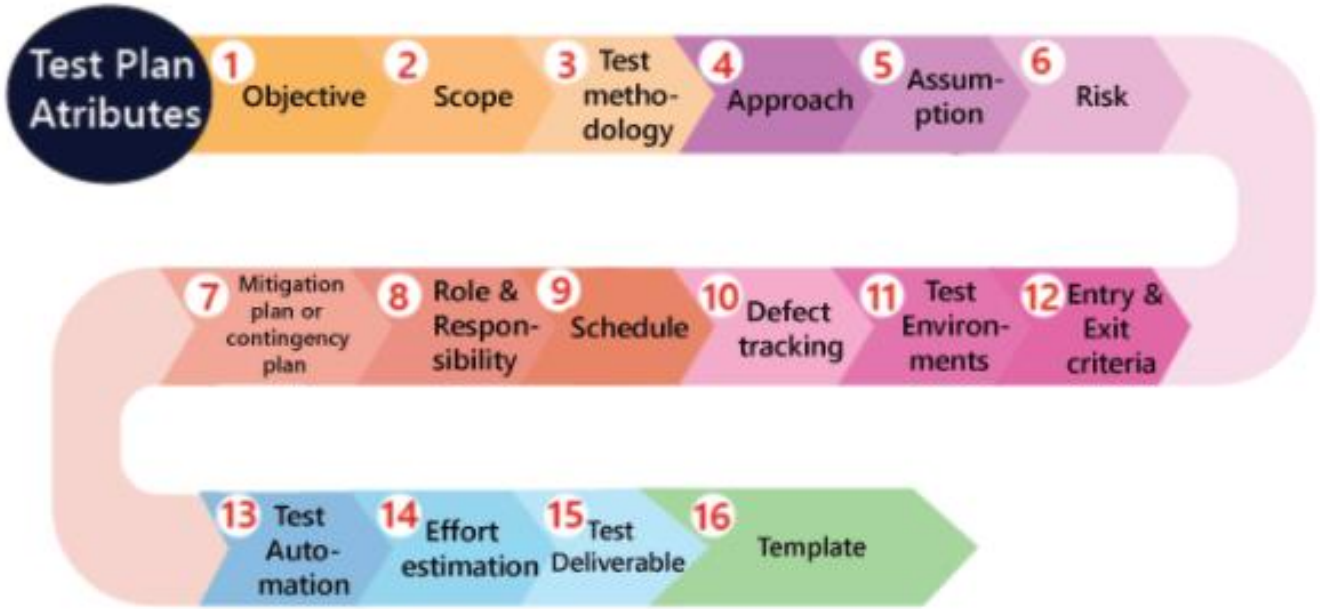
TEST PLANNING



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TEST SCENARIOS/CASES AND SCRIPTS

Test Scenarios: A Test Scenario is any functionality that can be tested. It is also called Test Condition or Test Possibility.

Test Cases: It is a document that contains the steps that have to be executed; it has been planned earlier.

Test Script: It is written in a programming language and it's a short program used to test part of the functionality of the software system. In other words, a written set of steps that should be performed manually.

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Test case ID	Test case description	Prerequisites	Test steps	Test data	Expected Result	Actual Result	Status	Created By	Date of creation	Executed By	Date of execution
TC001	The objective of this test case is to verify the 'Login' of Gmail account	1. User is authorized 2. Has an account in Gmail	1. Enter valid username 2. Enter valid password 3. Click on 'Login' button	1. User account should be present in Gmail	1. User should be able to login his Gmail account with his valid credentials 2. 'Invalid username or password' should get displayed if the username and password are not valid	1. If the valid credentials are entered then the user will be able to login his / her account 2. If invalid credentials are entered then nothing happens(the expected message is not displayed)	Fail	Rajesh	1/1/2016	Umesh	1/2/2016

CATEGORIES TO KEEP IN MIND WHILE WRITING TEST SCENARIOS/CASES

- Performance Testing
- Stress Testing
- Failover Testing
- Compatibility Testing
- Usability Testing
- Scalability Testing
- Security Testing

- Reliability Testing
- Endurance Testing
- Recovery Testing
- Internationalization Testing
- Localization Testing
- Accessibility Testing
- Compliance Testing

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EXAMPLES OF TESTING TYPES

Social Media Applications	Helpline System	Books Management System
• Performance Testing • Stress Testing • Security Testing • Internationalization Testing • Localization Testing • Accessibility Testing	• Performance Testing • Stress Testing • Reliability Testing	• Performance Testing

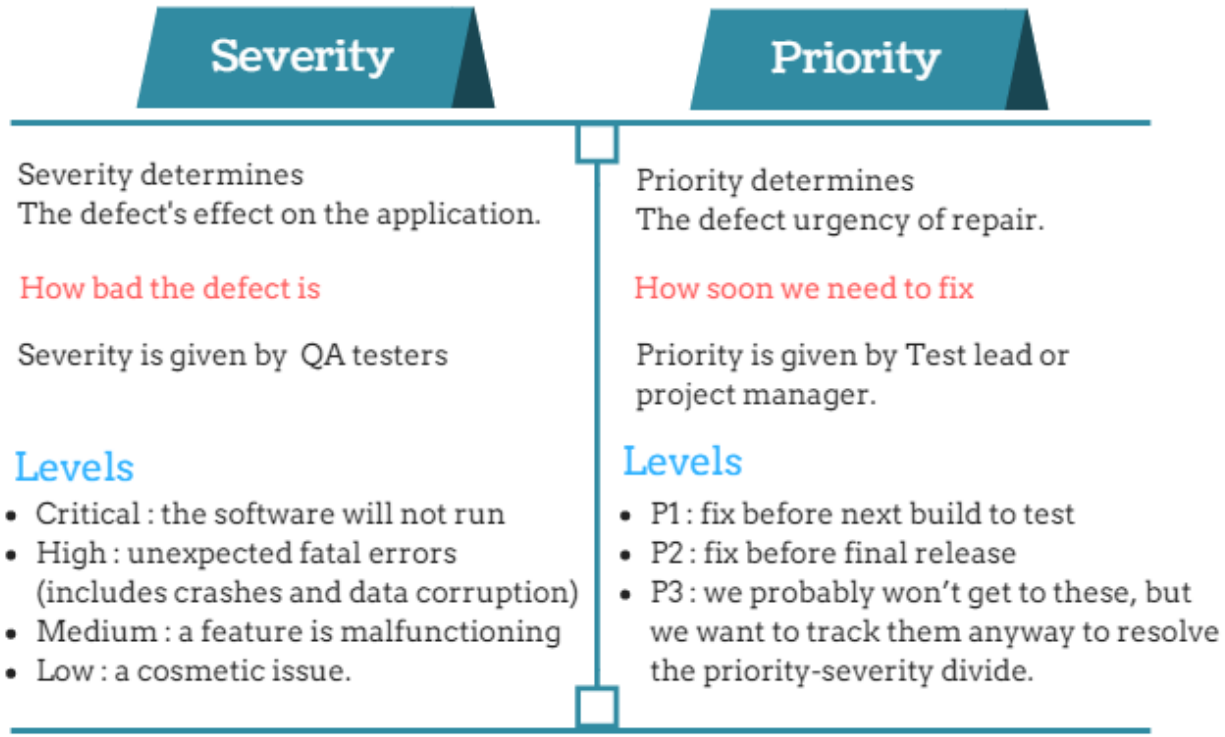
Usability Testing

- Mobile Recharge via Paytm vs Banking Applications

QA BEST PRACTICES

- Test one thing at a time
- Understand the types of testing on offer
- Use existing set of Regression Test
- Report and track bugs
- Choose the right environment for tests
- Don’t neglect the UI
- Automate, Automate & Automate where due

PRIORITY AND SEVERITY



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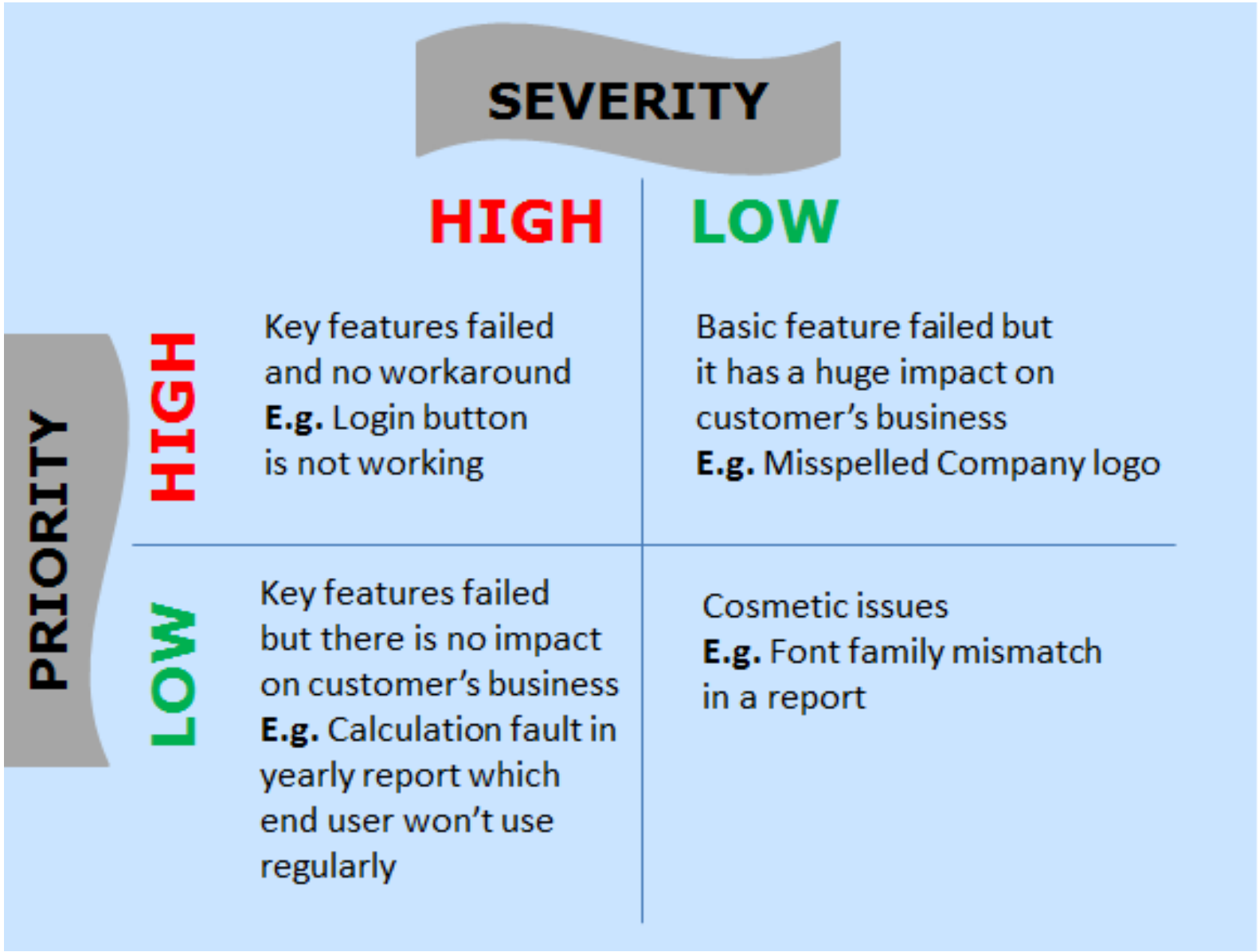
PRIORITY AND SEVERITY



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DEFECT LIFE CYCLE

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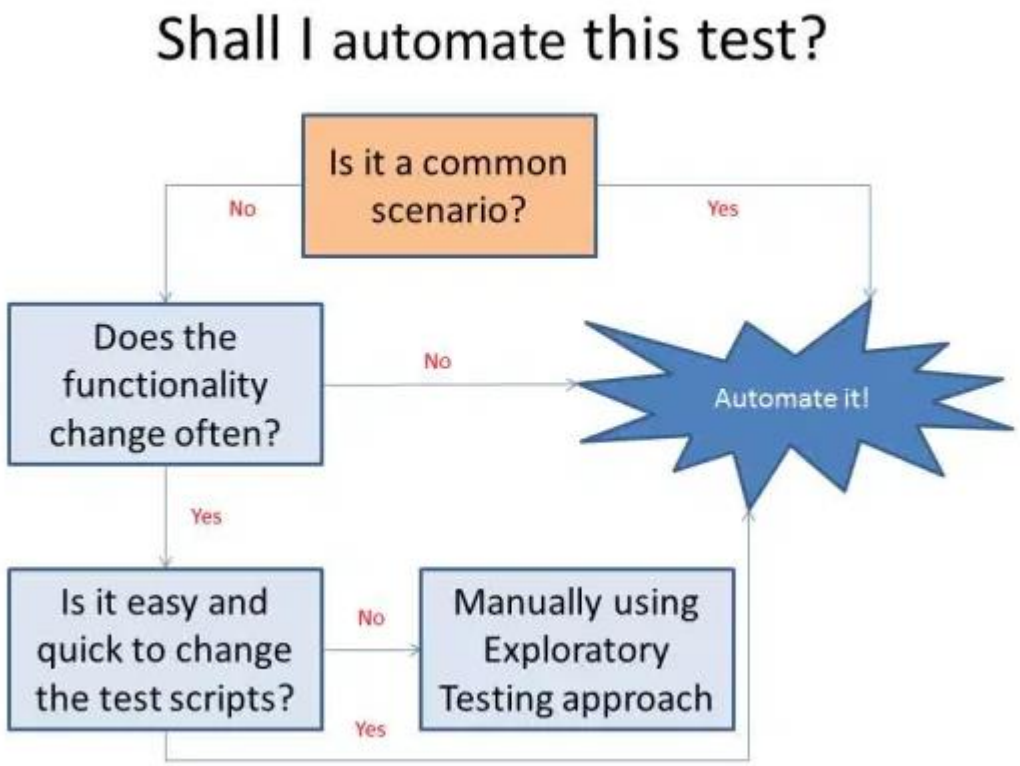
WHAT TO AUTOMATE AND WHAT NOT



WHAT NOT TO AUTOMATE

It is best NOT to automate:

- Subjective tests
- Frequently changing requirements
- Ad-hoc tests

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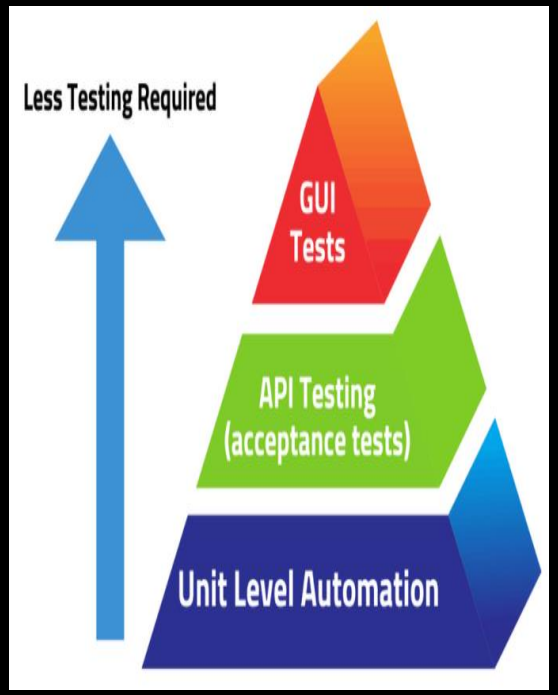
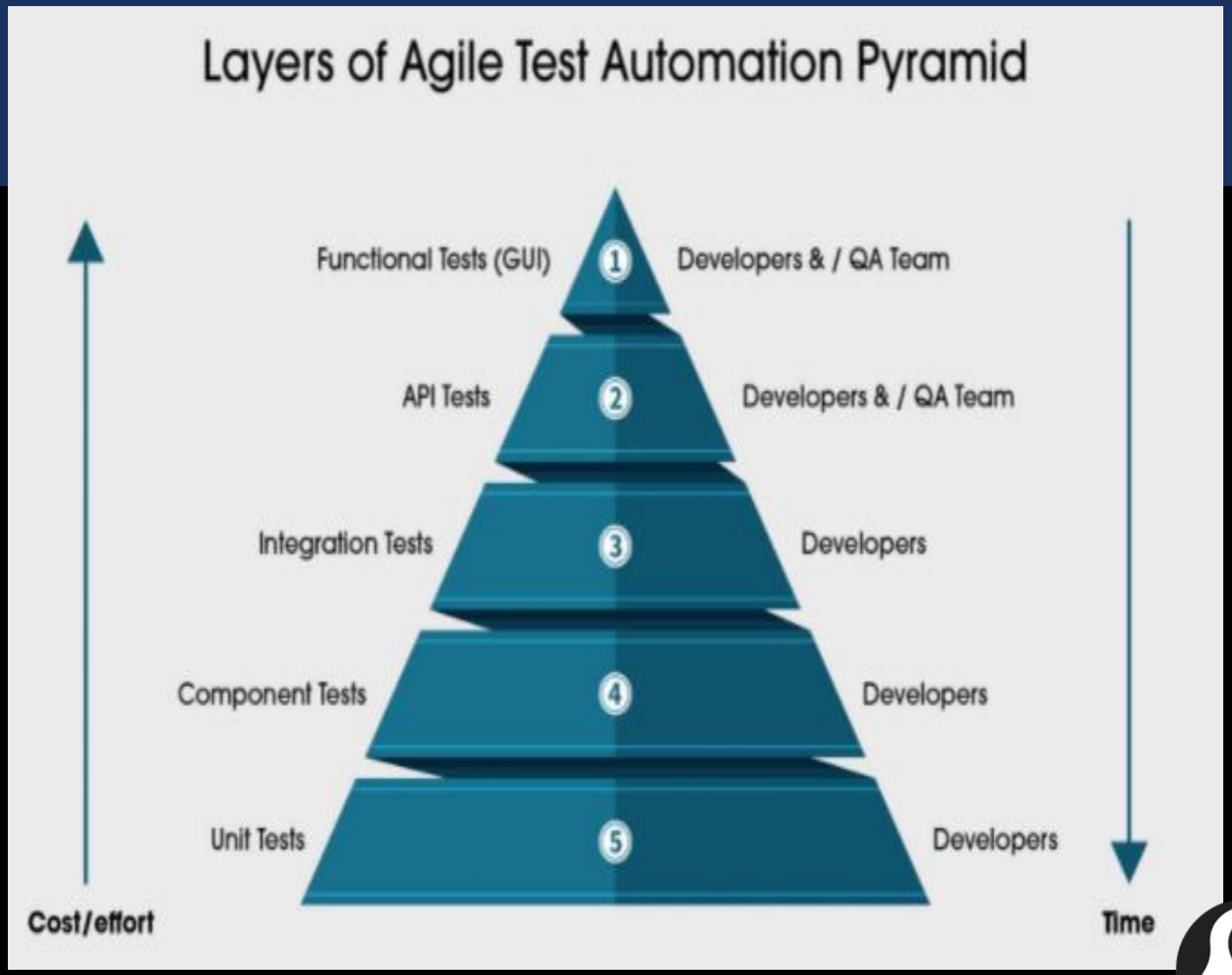
WHEN TO AUTOMATE

- Smoke Testing
- Regression Testing
- Load Testing
- Performance Testing

AGILE AUTOMATION PYRAMID





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Best Automation Testing Tools for 2021

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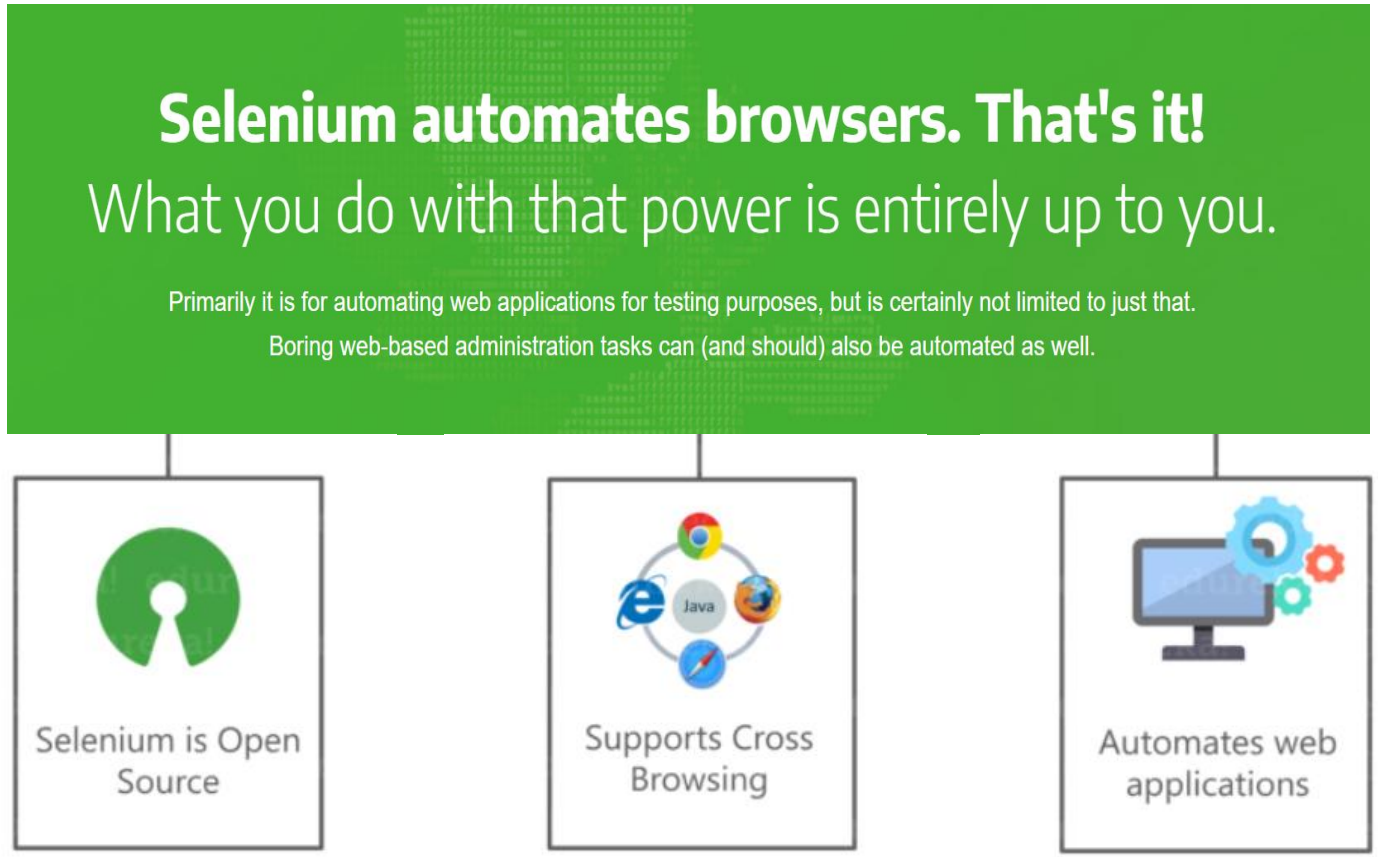
HOW TO AUTOMATE WEB APPLICATIONS

- Selenium
- Python



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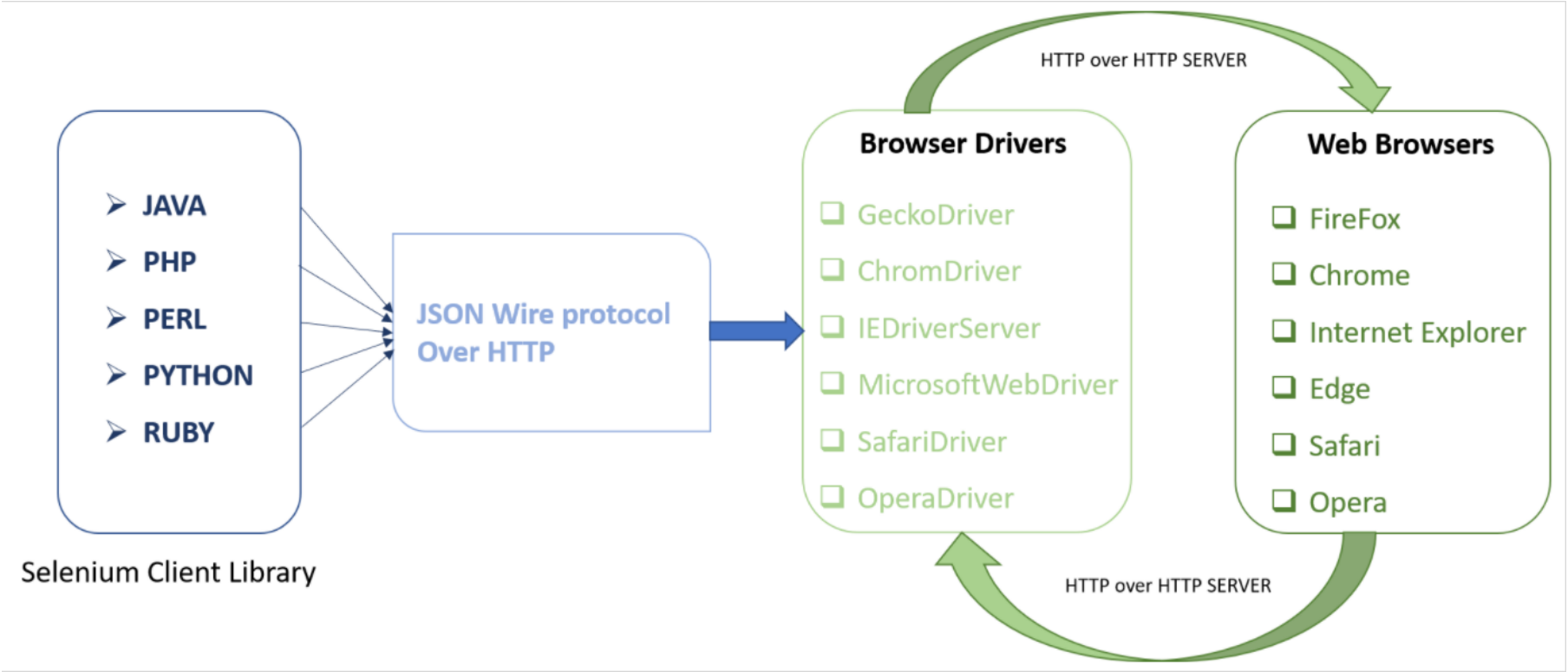
SELENIUM ARCHITECTURE



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SELENIUM LOCATORS (8 IN TOTAL)

THE RECOMMENDATION IS TO KEEP YOUR LOCATORS AS COMPACT AND READABLE AS POSSIBLE.
ASKING WEBDRIVER TO TRAVERSE THE DOM STRUCTURE IS AN EXPENSIVE OPERATION, AND THE MORE YOU CAN NARROW THE SCOPE OF YOUR SEARCH, THE BETTER.

Locator	Description
class name	Locates elements whose class name contains the search value (compound class names are not permitted)
css selector	Locates elements matching a CSS selector
id	Locates elements whose ID attribute matches the search value
name	Locates elements whose NAME attribute matches the search value
link text	Locates anchor elements whose visible text matches the search value
partial link text	Locates anchor elements whose visible text contains the search value. If multiple elements are matching, only the first one will be selected.
tag name	Locates elements whose tag name matches the search value
xpath	Locates elements matching an XPath expression