Automation Concepts

What and Why?

- Using some tool to execute test cases in an automated way
- Tool does -
  - Open pages or applications
  - Enter test data
  - Compare actual results with expected results
  - Generate test reports


why
automation?

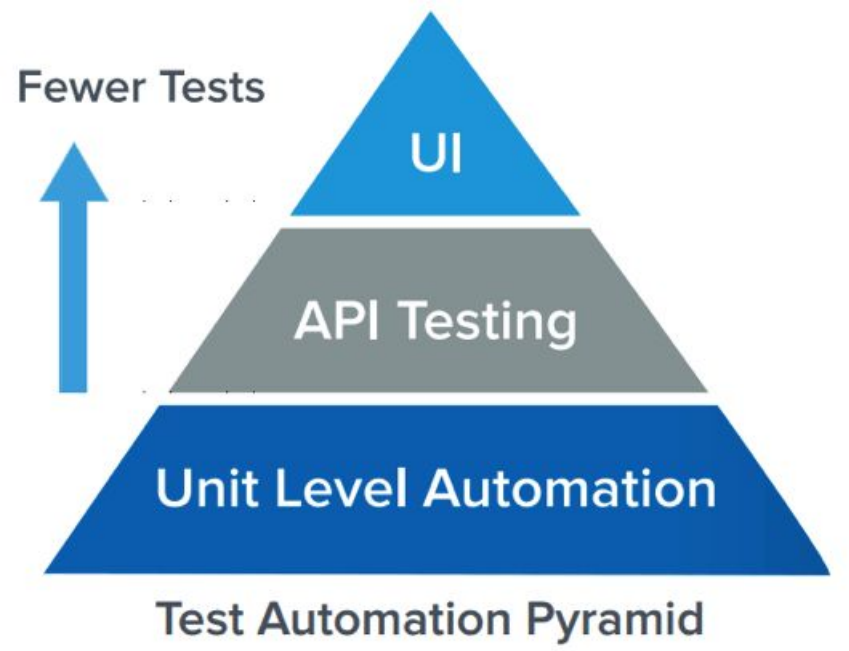
- Manual Testing of all workflows, all fields, all negative scenarios is time and money consuming
- It is difficult to test for multilingual sites manually
- Can become boring and hence error-prone

- Automation does not require human intervention. You can run automated test unattended (overnight)
- Increases the speed and accuracy of test execution
- Helps increase Test Coverage

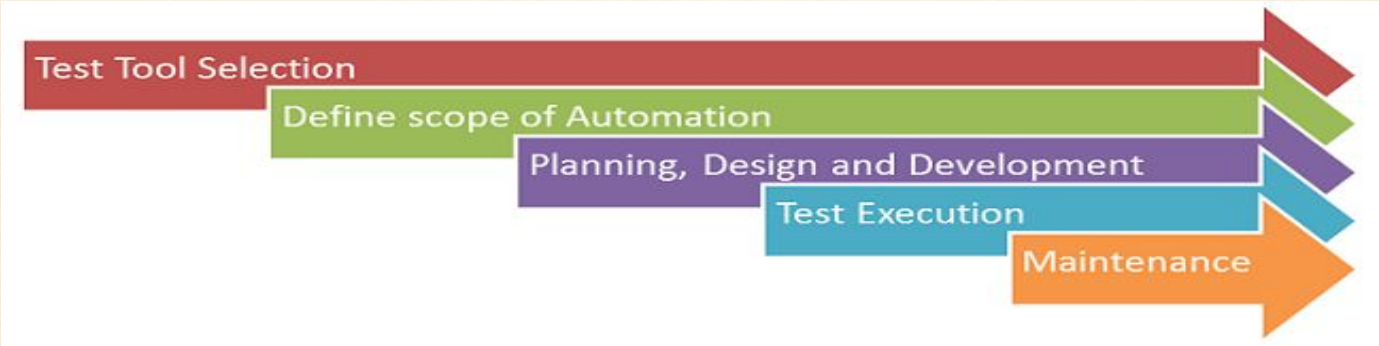
Which test cases to automate?

- High Risk - Business Critical test cases
- That are repeatedly executed
- That are very tedious or difficult to perform manually
- That are time-consuming

Strategy


Fewer Tests
UI
API Testing
Unit Level Automation
Test Automation Pyramid

Process


Test Tool Selection
Define scope of Automation
Planning, Design and Development
Test Execution
Maintenance

- Tool Selection
  - Selenium does not support Desktop application
  - QTP does not support Informatica
  - So we should do a PoC (Proof of Concept) to check whether a chosen tool supports AUT (Application Under Test) or not
- Defining scope
  - Discussed in “Which test cases to automate?”

Activity

- Google and list names of Automation testing tools
- Collect names of minimum 5 tools

- Planning, Design and Development
  - Create an Automation Strategy and a Plan
  - Which tool to use
  - ***Framework*** and its features
  - Scope is finalised
  - Testbed is prepared
  - Schedule is finalised
  - Automation deliverables have been finalised

- Test Execution
  - Use the test data prepared
  - Execute automated test cases
  - Detailed test reports are generated
- Test management tools (e.g. QC - Quality Center) support invoking automation scripts (e.g. QTP scripts)
- Support triggering test execution on multiple machines
- Execution mostly happens overnight

Activity

- Google about QC and QTP
- Know which company these tools belong to
- Originally who developed them, currently who own them and which company was involved in between

- Maintenance
  - Automation is also a “Software”
  - As SUT or AUT evolves over time with new features getting added, Automation also have to evolve
  - New scripts get added, existing ones get reviewed and maintained
  - Air is to improve overall efficiency and effectiveness of automation effort

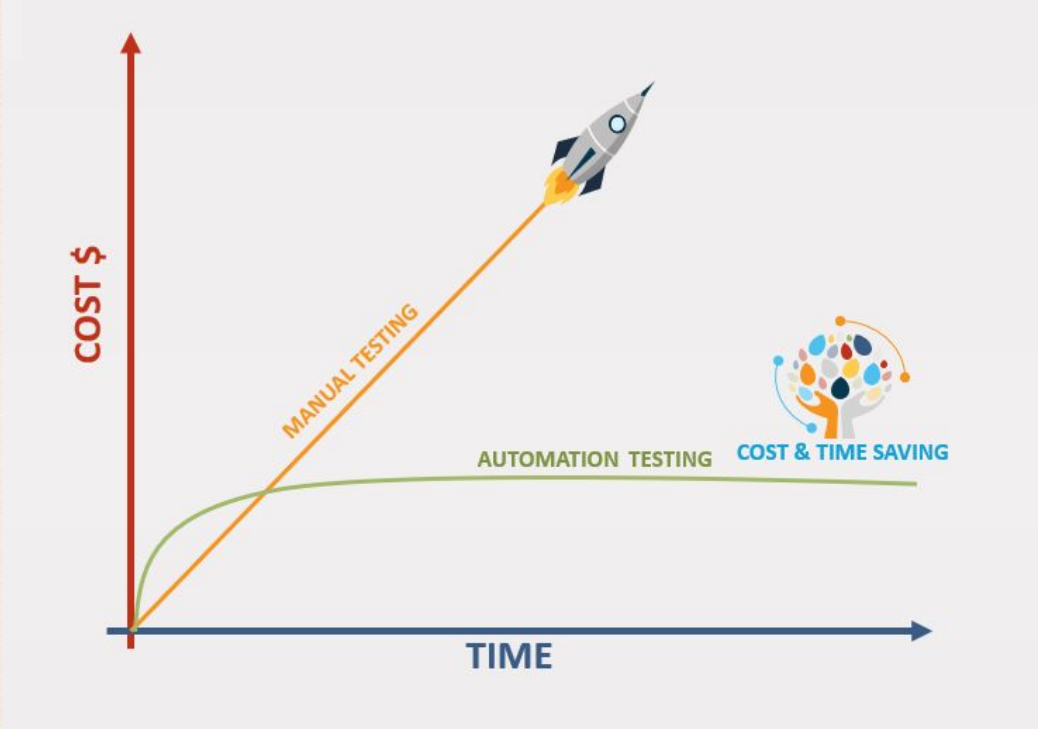
Who should be involved?

- Agile testing follows "***Shift-Left***" approach
- Means testing starts much earlier in the application lifecycle
- So developers or testers with strong technical expertise get involved in Automation journey from the very beginning

- Developers
  - Focus on implementing automation as part of their development by automating their unit testing
- Automation Engineers
  - Focus on automating Integration and Regression test cases
- Manual Testers
  - Focus on using the automation test cases to execute various types of testing using the test data that they prepare

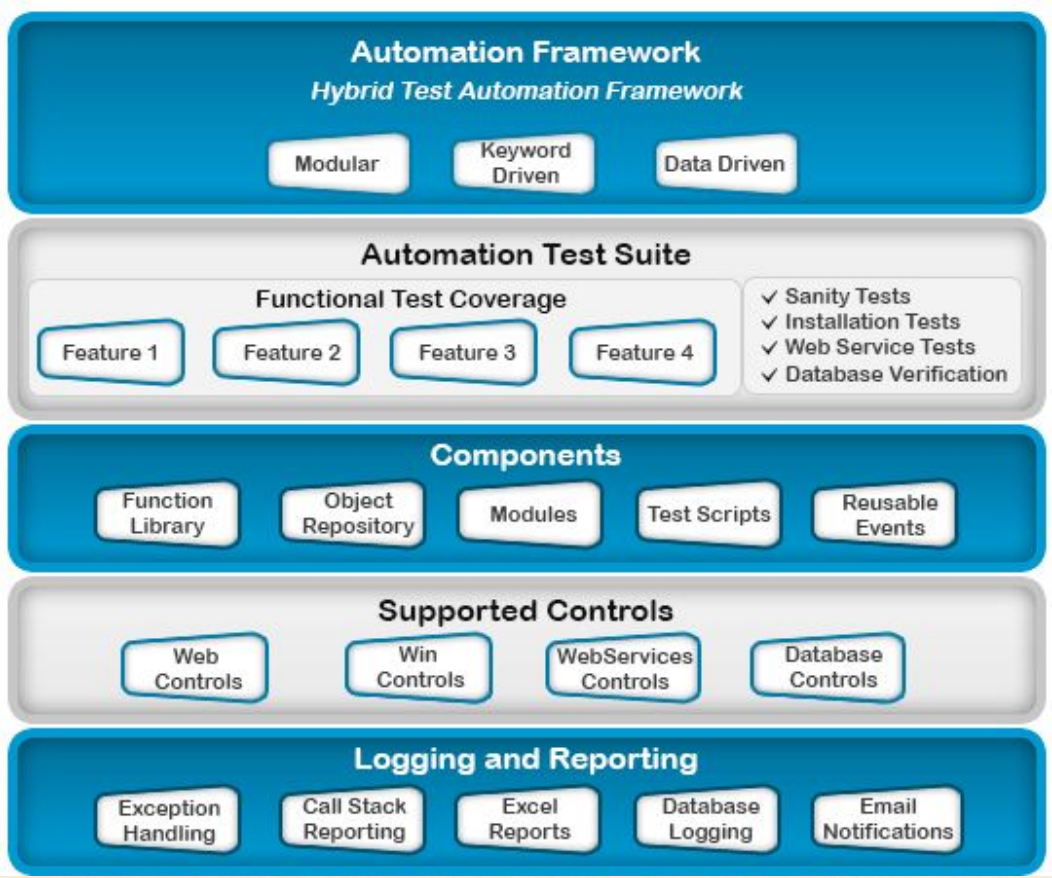
Automation Misconceptions

- It is possible to achieve 100% automation
- Test automation will replace manual testers
- Developers are best for automation
- Automated testing is better than manual
- All automated test should pass always
- There is always high return of investment in Test automation

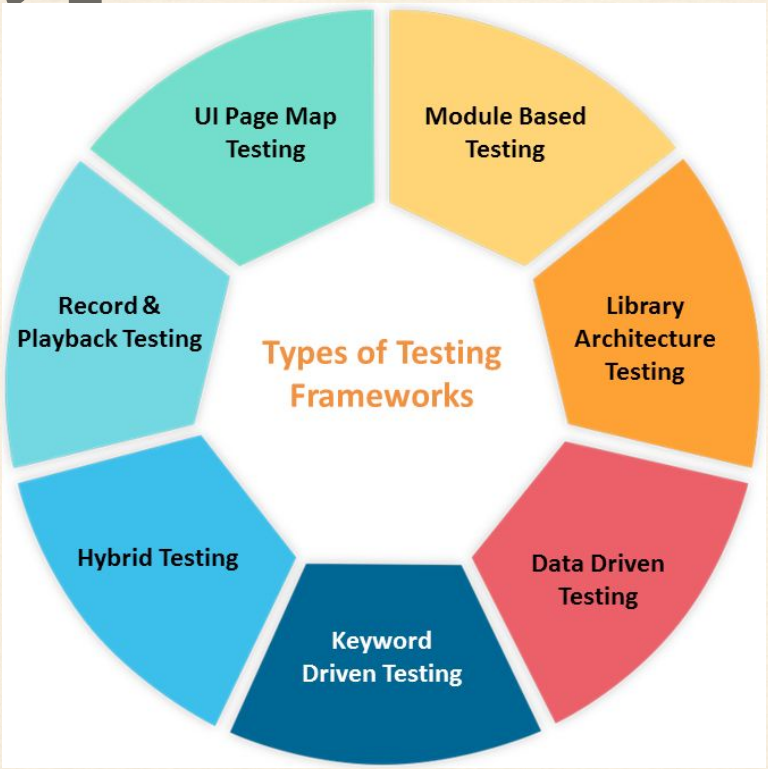

COST $
MANUAL TESTING
AUTOMATION TESTING
COST & TIME SAVING
TIME

Automation Framework

- What is a framework?
  - A basic structure underlying a system, concept, or text
- The framework we are talking about here is a Test Automation Framework


Automation Framework
Hybrid Test Automation Framework
Modular
Keyword Driven
Data Driven
Automation Test Suite
Functional Test Coverage
Feature 1
Feature 2
Feature 3
Feature 4
✓ Sanity Tests
✓ Installation Tests
✓ Web Service Tests
✓ Database Verification
Components
Function Library
Object Repository
Modules
Test Scripts
Reusable Events
Supported Controls
Web Controls
Win Controls
WebServices Controls
Database Controls
Logging and Reporting
Exception Handling
Call Stack Reporting
Excel Reports
Database Logging
Email Notifications

Types of Frameworks



Linear Scripting — Recording and Playback

- Tester records steps (Navigation and User Inputs)
- Inserts check points (Validations)
- Plays back the script and notes test results

- Advantages:
  - Fastest way to generate script
  - Automation expertise not needed
- Disadvantages:
  - Little reuse of scripts
  - Test data is hardcoded in to scripts
  - Maintenance nightmare

Activity

- Install Selenium IDE as Firefox plugin
- Open JPetStore Demo website
- Automate SignIn scenario
- Observe the code generated
- Export recorded script to Java and observe the code generated

Module Driven Framework

- Structural Scripting or Functional Decomposition
- Created using record and play back method
- Later common tasks are identified and grouped as functions

- Advantages:
  - Better code reuse compared to linear scripting
  - Slightly easier maintenance
- Disadvantages:
  - Little technical expertise needed
  - More time needed
  - Test data is still hard coded into the scripts

Data Driven Framework

- Logic resides in Test Scripts
- Test Data is separated and kept outside
- Data is read from external files (excel, csv, text, xml, json, sql etc.)
- Scripts are developed using either of the above methods

- Advantages:
  - Change in test data does not affect test scripts
  - Same test case can be executed with multiple test data
  - Positive and negative scenarios can be tested just by choosing appropriate test data
- Disadvantages
  - More time and expertise needed

Keyword Driven Framework

- Also called Table-Driven or Action Word based testing framework
- Test case is divided into 4 parts
  - Test step — Type username
  - Object of test step — User name box
  - Action on the object — Type
  - Data for the object — Sample user name

Activity

- Explore https://shop.demoqa.com/
- Play around with various modules and think of various test scenarios
- Repeat what you have done with JPetStore Demo with this web site

POM - Page Object Model

- In this we separate objects and methods to work on those objects from the underlying tests
- We create one java class for each page of the application
- In that java class we store various elements that are present in that page and the methods to work with those elements

Activity

- Go to http://shop.demoqa.com/
- Pick any 2 pages
- List all the objects you see in those pages in plain english words

Hybrid Framework

- Combination of any of the above types of frameworks

Characteristics of Matured Framework

- Handle scripts and data separately
- Create libraries
- Follow coding standards
- Offer high extensibility
- Less maintenance
- Script/Framework version control

Commonly Seen Elements

- Links
- Text boxes
- Radio button
- Check box
- Frames
- Images
- Dropdown