Types of Test Framework

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There are six common types of test automation frameworks, each with their own architecture and differing benefits and disadvantages. When building out a test plan, it's important to choose the framework that is right for you.

- Linear test Framework
- Modular Based Testing Framework
- Library Architecture Testing Framework
- Data-Driven Framework
- Keyword-Driven Framework
- Hybrid Testing Framework

Linear test framework:

With a linear test automation framework, also referred to as a record-and-playback framework, testers don't need to write code to create functions and the steps are written in a sequential order. In this process, the tester records each step such as navigation, user input, or checkpoints, and then plays the script back automatically to conduct the test.

Modular Based Testing Framework:

Implementing a modular framework will require testers to divide the application under test into separate units, functions, or sections, each of which will be tested in isolation.

After breaking down the application into individual modules, a test script is created for each part and then combined to build larger tests in a hierarchical fashion. These larger sets of tests will begin to represent various test cases.
A key strategy in using the modular framework is to build an abstraction layer, so that any changes made in individual sections won't affect the overarching module.

Library Architecture Testing Framework:

The library architecture framework for automated testing is based on the modular framework, but has some additional benefits. Instead of dividing the application under test into the various scripts that need to be run, similar tasks within the scripts are identified and later grouped by function, so the application is ultimately broken down by common objectives. These functions are kept in a library which can be called upon by the test scripts whenever needed.

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Data-Driven Framework:

Using a data-driven framework separates the test data from script logic, meaning testers can store data externally. Very frequently, testers find themselves in a situation where they need to test the same feature or function of an application multiple times with different sets of data. In these instances, it's critical that the test data not be hard-coded in the script itself, which is what happens with a Linear or Modular-based testing framework.

Setting up a data-driven test framework will allow the tester to store and pass the input/ output parameters to test scripts from an external data source, such as Excel Spreadsheets, Text Files, CSV files, SQL Tables, or ODBC repositories.

The test scripts are connected to the external data source and told to read and populate the necessary data when needed.

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Keyword-Driven Framework:

In a keyword-driven framework, each function of the application under test is laid out in a table with a series of instructions in consecutive order for each test that needs to be run. In a similar fashion to the data-driven framework, the test data and script logic are separated in a keyword-driven framework, but this approach takes it a step further.

In the table, keywords are stored in a step-by-step fashion with an associated object, or the part of the UI that the action is being performed on. For this approach to work properly, a shared object repository is needed to map the objects to their associated actions.

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Hybrid Test Automation Framework

As with most testing processes today, automated testing frameworks have started to become integrated and overlap with one another. As the name suggests, a hybrid framework is a combination of any of the previously mentioned frameworks set up to leverage the advantages of some and mitigate the weaknesses of others.

Every application is different, and so should the processes used to test them. As more teams move to an agile model, setting up a flexible framework for automated testing is crucial. A hybrid framework can be more easily adapted to get the best test results.

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