Part 1: A Conceptual Test Automation Framework Design Using POM Approach

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Preamble

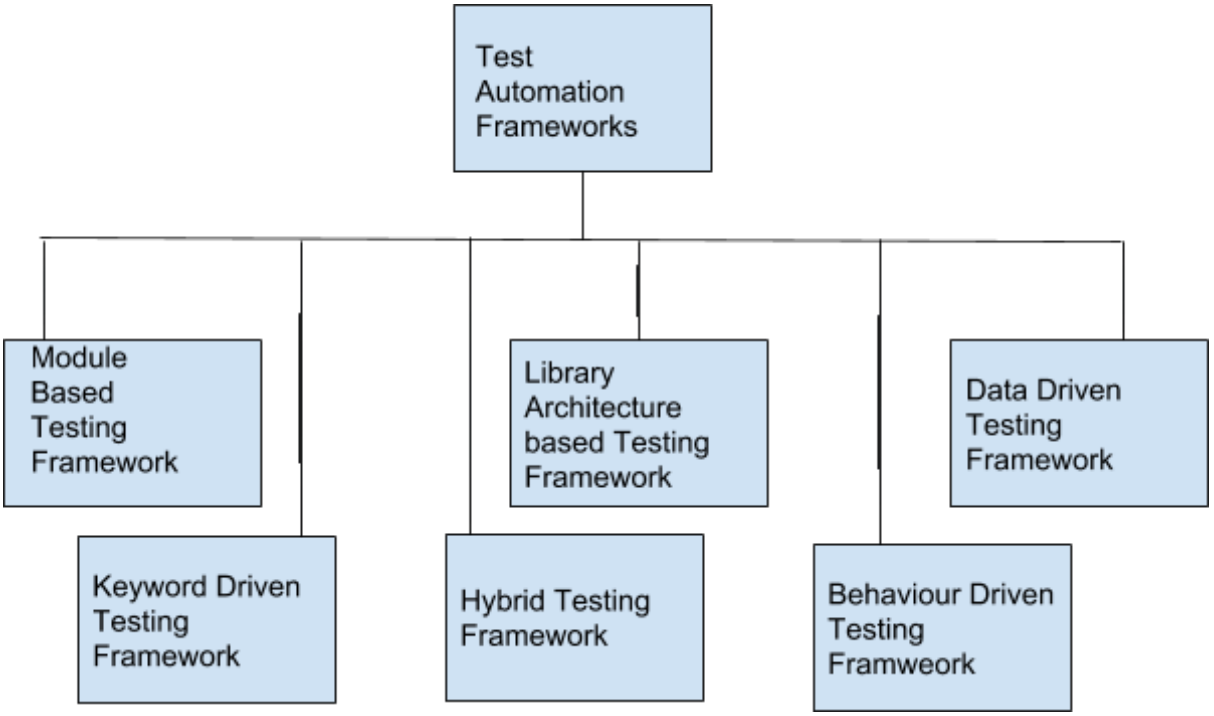
A framework is defined as an organization's way of doing things. It is a standard structure designed to provide guidance for successful execution of software projects.A Test Automation Framework can be understood to mean a constructive blend of various guidelines, coding standards, concepts, processes, practices, project hierarchies, modularity, reporting mechanism, test data injections etc. to pillar automation testing. Thus, the user can follow these guidelines while automating application to take advantages of various productive results. A very famous computer networking model easily comes to mind when I think of automation frameworks. The ISO Open Systems Interconnection (OSI) model (divided into seven layers) makes computer networking communication possible and easy.

Keywords: Page Object Model,Page Chaining Model, Page Factory, Object Repository, Automation Framework.

Introduction

The Page Object Model is one of the approaches for implementing Automation Framework Design. There are other popularly used Automation Frameworks as shown in Fig 1:

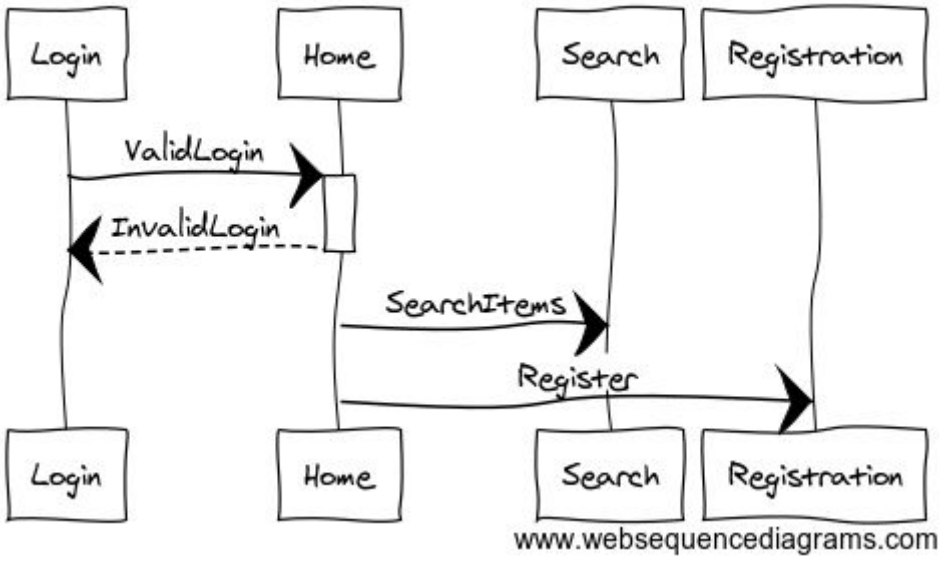
Fig 1: Popularly Used Automation Frameworks



For each framework, there are advantages and disadvantages. There is no single framework that can meet all of the needs of the designer. The Framework designers goal is to aim to meet the peculiarities and requirement of each software project. For the POM, each page of the system under test (SUT) is treated as a separate object. All pages of the application is interconnected to each other. Also referred to as Page Chaining Model, there is a chain (links, forward/backward/submit buttons)

ensuring seamless integration of page objects of the website. A successful Login Action redirects user to the Home Page from Login Page. The Home page becomes the Landing page from the Login page. From the Home Page, the user can access the Search page or the Registration page or go back to the Login page by activating a LogOut action.

Fig 2: Page Chaining Model



Page Objects

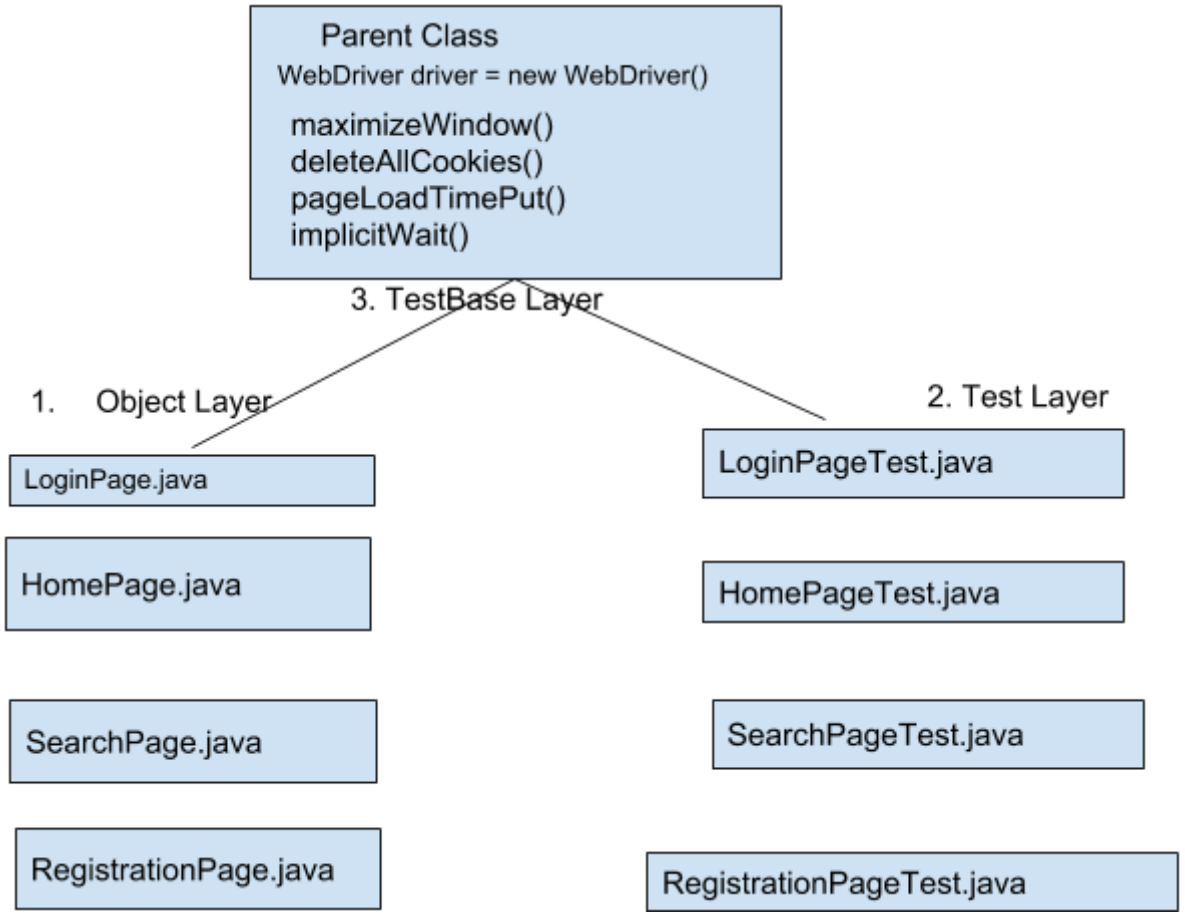
POM is a design pattern to create Object Repository for web UI elements.
Under this model, for each web page of the application under test (AUT), there should be corresponding page class.This Page class will find the WebElements of that web page and also contains Page methods which perform operations on those WebElements.
The name of these methods should be given as per the task they are performing, i.e.,signOnAction().

A LoginPage may have elements like Username & Password field, Submit button icon and actions like loginAction/ signOnAction. The Page Object Repository is a collection of all the web elements on a page. This page object is also an object-oriented class that serves as an interface to a page of your application.

COMPONENTS OF THE POM DESIGN PATTERN

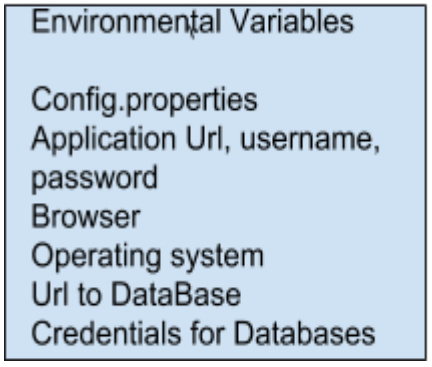
All the Page Objects of the System form the first layer of the Automation Framework. For each Page Object, there is a corresponding Test Class. The test class use the methods of the Page Object class whenever they need to interact with the UI of that page, the benefit is that if the UI changes for the page, the tests themselves don't need to be changed, only the code within the page object needs to change.There should be a corresponding test class for each Page Object.The Test Classes form a separate layer of the framework.To avoid code duplications, all the actions and variables that are common to all the classes are put into a TestBase class to form a hierarchy of Parent Class and Child Class relationship that can inherit from the Parent class.This is illustrated diagramatically in Fig 3 below:

Fig 3: Components of Page Object Design Pattern For Automation Framework

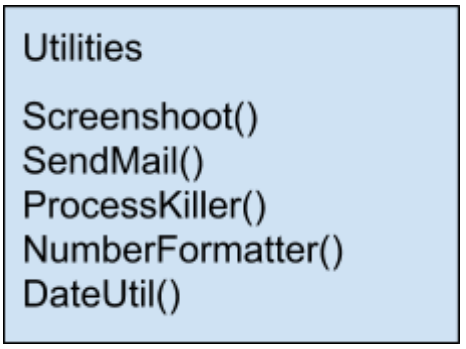


Other components of the framework includes the Environmental variable class and the Framework Utilities classes.

4. Environmental Variables



5. Utilities



6. Test Data Excel File (TestData.xlsx). We will use Apache POI API to read the Excel test data file in key, Value mapping format.

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7. Test Report Folder: The folder for generated test reports in TestNG, HTML, XML Report or Extent Report formats.

8. Various Technologies required for the Automation framework include java, Eclipse IDE, Selenium WebDriver, TestNG, Apache POI API, Extent Report, Log4J API, Jenkins CI, GIT, Browsers like Firefox,Chrome,Safari or Internet Explorer,Operating Systems like Windows, Linux or Mac, VMs and SauceLab or BrowserStack for cross browser testing.

Obi Nzeadibe is a Software Automation Framework Design Expert based in North Delta, British Columbia. With over 18 years experience in Software Quality Assurance, he has worked with Xcert International Inc as Interoperability Analyst, RSA Security Inc as Intermediate Software Engineer and at Fortinet Technology Inc as Developer QA. He enjoys reading and writing.

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