

# Implementation of Page Object Model in Selenium Automation

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**Abstract:** In automation of any UI using Selenium, Too many duplicated code is used. Duplicated code could be caused by duplicated functionality and this will result in duplicated usage of locators. If some locator will change, you have to walk through the whole test code to adjust locators where necessary. By using the page object model we can make non-brittle test code and reduce or eliminate duplicate test code. Beside of that it improves the readability and allows us to create interactive documentation. We can also create tests with less keystroke. An implementation of the page object model can be achieved by separating the abstraction of the test object and the test scripts.

**Keywords:** Page Object Model, Selenium, Automation Framework, Test NG.

## I. INTRODUCTION

The Page Factory Class is an extension to the Page Object design pattern. It is used to initialize the elements of the Page Object or instantiate the Page Objects itself. Annotations for elements can also be created (and recommended) as the describing properties may not always be descriptive enough to tell one object from the other.

## II. LITERATURE SURVEY

### A. Manual Testing

This type includes the testing of the Software manually i.e. without using any automated tool or any script. In this type the tester takes over the role of an end user and test the Software to identify any un-expected behaviour or bug. There are different stages for manual testing like unit testing, Integration testing, System testing and User Acceptance

### B. Automation Testing

Automation testing which is also known as “Test Automation”, is when the tester writes scripts and uses another software to test the software. This process involves automation of a manual process. Automation Testing is used to re-run the test scenarios that were performed manually, quickly and repeatedly.

Selenium is a free (open source) automated testing suite for web applications across different browsers and platforms. Selenium focuses on automating web-based applications. Selenium is not just a single tool but a suite of software's, each catering to different testing needs of an organization. It has four components.

- Selenium Integrated Development Environment (IDE)
- Selenium Remote Control (RC)
- Web Driver
- Selenium Grid

## III. SYSTEM DESIGN DETAILS

Page Factory is an inbuilt page object model concept for Selenium Web Driver, but it is much optimized. Page Factory can be used in any kind of framework such as Data Driven, Modular or Keyword Driven. Page Factory gives more focus on how the code is being structured to get the best benefit out of it.

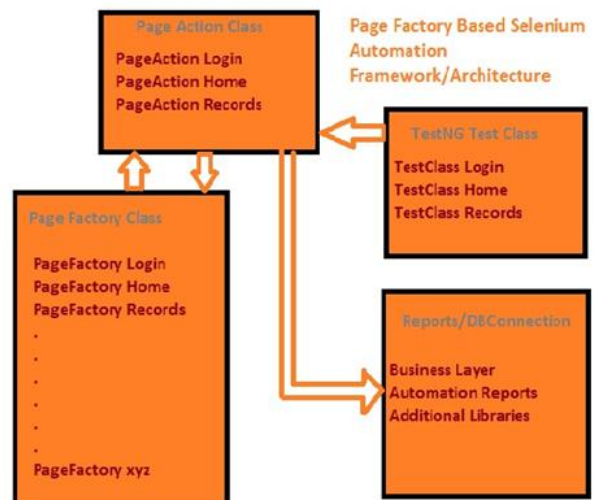


Fig 1: Architecture Design

### A. Test Class

In Test Class, we will write an actual selenium test script. Here, we call Page Action and mentioned actions to be performed on Web Pages. For each page, we can write our own test class for better code readability. We can write test cases in @Test annotation.

### B. Page Action Class

In Page Action Class, we can write all web pages action as per the pages and functionality. Under Page Action component, for each page in the application, we have corresponding Page class.

**C. Page Factory Class**

Page Factory class is nothing but Object Repository in other term. For each web page, it has its own Page Object definitions. Each web element should uniquely get identified and should be defined at class level. We will use Find By annotation and will define web element so that we will be able to perform actions on them.

**A. Reports/DB Connection Class**

Here, we can write our own business layers, Report Structure, DBConnection, etc. This component is called mostly from Page Action class under Page Action Method.

**Environment Required**

- Java
- Eclipse IDE
- Selenium Webdriver
- TestNG

**IV. FRAMEWORK STRUCTURE**

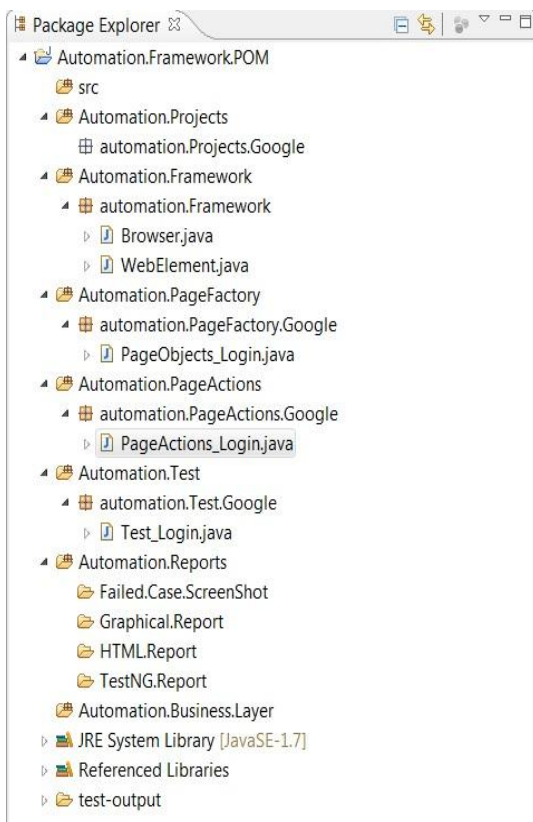


Fig 2: Framework Structure

**Automation Projects**

Suppose we are working on multiple Projects/Modules and there is a requirement to automate those modules, then in this Source Folder, we have different Projects/Modules listed.

With this, it is easy to make your own Test Suites for specific Project/Modules. We can write our own initialization script to load all components related to any specific Modules/Project.

**A. Automation Framework**

In Automation Framework source folder, we add Browser, Component functions, Web Element and other common functions that we use later on in our Framework.

**V. IMPLEMENTATION DETAILS**

Page Factory Class

```
@FindBy(xpath="//*[@id='Email']")
publicWebElementgmailUserIDWebEdit;
```

Page Action Class

```
publicclassPageActions_Login
{
    WebDriver driver;
    PageObjects_Loginpo; // Create Instance to Page Factory class
    publicPageActions_Login(WebDriver driver)
    {
        this.driver = driver; // set webDriver for current Page Action
    }
}
```

TestNG test Class

```
@Test (priority =0)// Try to sign with Invalid Password
publicvoidSignIntoGMailInvalidPassword() {
    actionLogin = newPageActions_Login(driver);
    actionLogin.enterUserIDPassword("upadhyay40","xyz");
    StringloginPageTitle =
    actionLogin.getWrongPasswordTextMessage();
    Assert.assertTrue(loginPageTitle.contains
    ("The email and password you entered don't match."));
}
```

**VI. ADVANTAGES OF USING PAGE OBJECT PATTERN**

- Easy to maintain.
- Easy readability of scripts - since the test scripts, functions and locators are in different classes it is easy to walk through the code.
- Eliminate redundancy - no duplicity of functions or locators.
- Re-usability of code - a locator or function can be reused in the tests.
- Reliability.
- Test coverage is more since the tests are written program wise.
- Performance of each test can be known.
- The changes is to be made only in Page Factory class if any locator changes - no need to walk through the whole test code to adjust locators

**VIII. CONCLUSION**

Testing is the process of evaluating a system or its component(s) with the intent to find that whether it

satisfies the specified requirements or not. This activity results in the actual, expected and difference between their results. In simple words testing is executing a system in order to identify any gaps, errors or missing requirements in contrary to the actual desire or requirements. Automation Testing is used to re-run the test scenarios that were performed manually, quickly and repeatedly. Selenium is a free (open source) automated testing suite for web applications across different browsers and platforms. Page Factory is an inbuilt page object model concept for Selenium Web Driver, but it is much optimized. Page Factory can be used in any kind of framework such as Data Driven, Modular or Keyword Driven. Page Factory gives more focus on how the code is being structured to get the best benefit out of it.

### ACKNOWLEDGEMENT

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### BIOGRAPHIES



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