There are 8 major components available in Framework.

1. Generic Library
2. Object Repository (POM)
3. Test Data
4. Resources
5. Test Script
6. Batch Runner (TestNG.html)
7. Html report
8. ScreenShot
9. **Generics:** Generics is a library of classes,which contains reusable methdos which is used for any project. An UI framework of generic library can contains the following basic classes (interfaces also)

**FileLib :** all the methods related to reading / writing test data from an external resource are stored, it is implemented by usig Apache POI at properties class.

As per the rule of automation data should not be hard coded within a test script, so in order to read the data from excel and property files, we do have file lib class.

**Base Class**: Base class contains common annotations which is required for all the test class like

@BeforeClass used to open the browser

@BeforeMethod used to login fo the base class

@AfterMethod used to logout from the base class

@AfterClass used to close the browser

WaitForPageToLoad(), waitForElement() , select () ... etc.

**Listener implementation class**: it is implemented by using TestNG Listener feature which is used to take the screen shot whenever test is getting failed.

1. **Page Object Repository:** help us to store all the web elements locators like xpath, id, name etc. Insted of hard coding them which is aganist automation rule.in order to develop page object repository we use java design pattern such as POM, PageFactory. Page object model is a well organized design pattern where we can store all web elements at a page level (Number of web pages will be equal to number of POM classes). Make sure all the web elements available in the POM classes should be private so that test writer cannot modify the locator from their test class. Page factory is an extended design pattern of POM which is used to initialise the element available in the POM class. PageFactory.initElements(driver,this);
2. **Test Data**: as per the rule of automation TestData should not be hard coded. Hence we maintain test data that is required to run a test case with the help of an external resource file like a) common data. Properties b) testScriptData .xlsx. CommonData.properties file contains global data which is common to all the test scripts like URL, UserName, PassWord, browser etc..
   1. URL: by changing URL we can run the test in any web server like staging, testing, production etc.
   2. UserName / PassWord: by changing credentials we can execute the test scipts in any credentials.
   3. Browser: by changing browser variable value we can run the test in any browser.
3. There are 3 types of external resources where test data can be stored
   1. Common data properties file
   2. Test data xlsx file
   3. JDBC file

This makes the readablilty , modification and maintenance of test related data easy. All the data which is required to run the test should be placed in excel file

1. Test Scriptes : Test scripts are the collections of actions to be performed on a system under test. As manual intervention should not happen in automation, we store test scripts in TestNG class for execution. All the test scripts related to a module should be stored in a single package and the package name should be <domain name>.<company name/project name><module name><test>

All the tests are automated using generic lib and object libraries. With the help of plugins like TestNG we can execute all the test scripts together.

1. TestNG: TestNGis a unit testing tool used to execute multiple test cases at a single time. Batch execution can be achieved in TestNG using TestNG.xml file where we can specify group suits, test case modules, exclusions etc.
2. Resources Jar: this components contains all the third party plugins which are required to run the tests. This may include third party tools like geko driver which is required for working with latest version of firefox. Similarly IEdirver Server.exe and ChromeDriver.exe which enable us to work with multiple browsers.
3. Reports: Test Reporting not only makes us aware of the status of the success or failure , but also helps in finding out the potential bugs which will also get to know the stability of the application soon after the test execution. TestNG generates the HTML reports which states the test execution results.
4. Screen Shots:in case of test cases/batch execution failure , we go for this mechanism to report where exactly the test case failed. This screen shot mechanism can be used along with test reporting for test robustness.