Automated Testing

Case Study
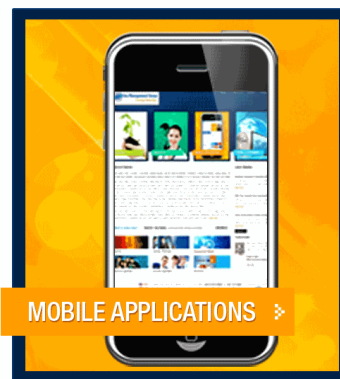
Contents

1 CASE STUDY ON QTP

KMG has successfully automated applications for few of our clients by using Mercury's QTP. KMG's automation experts were involved in Automation planning, designing framework, creating scripts, executing scripts and report generation.

1.1 CUSTOMER DETAILS

The customer is a multi-line property/casualty insurance group. Customer offers a broad range of insurance products including commercial property insurance, worker's compensation insurance, surety bonds and automobile insurance. It is full service company, also providing claims and loss control services.

Customer uses an application to administer the policy life-cycle, from application intake to rating and underwriting, from policy issuance to renewal, and everything in between. The policies issued using this application are further uploaded in PMS, which is a mainframe based policy management system.

1.2 BUSINESS PROBLEM

Challenge 1

The Customer did not have any prior experience in the Testing automation. KMG therefore provided a demo on the existing application by automating few test scenarios and that demo helped the customer get an idea on how the business would get benefit after automating the application.

Challenge 2

The customer's application had two parts; one is front end part based on .Net technology and other is mainframe part which is a command line interface (CLI) based application. Automating a mainframe application included various challenges. KMG provided the solution by automating both Mainframe and GUI based application.

1.3 TOOL SELECTION

Since client had no experience in Testing automation and therefore not sure which tool to acquire. KMG Automation team studied the client's application and functional specification and then presented two automation tools - QTP and UTP. These two tools were further compared in terms of compatibility against the product(s) and application(s) under test. After comparison it was found that both tools had almost similar features for automating a web or Windows based application, except UTP could not automate the mainframe part of the product and therefore KMG recommended to use QTP.

1.4 KMG AUTOMATION APPROACH

KMG provided the automation testing solution in 2 phases; Creation and Verification of test scripts and Execution of test scripts:

1.4.1 KMG AUTOMATION APPROACH FOR SCRIPT CREATION
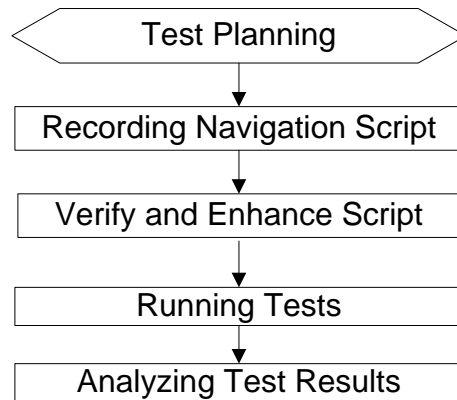
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            │  Recording Navigation Script │
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            │   Verify and Enhance Script  │
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1. **Test Planning:** KMG describes the test in detail prior to automation. It includes the exact steps to be followed, data to be input, and all items to be verified by the test. Test planning includes following activities:

   - Setting up Automation Test Plan and Strategy and estimating the time, effort and capacity needed for Automation

   - Senior Automation Experts start working on the Automation Framework that is to be designed for automation of the existing application Test cases.

   - Also started ramping up core team members on Automation tool and application. This immensely helps in scaling up the activity for Test Automation once framework is ready.

   - It is expected that questions, data issues, and application issues will be encountered and need to be addressed.

   - This phase in the automation approach is intended to clarify the test cases to be automated, familiarize the automation team with the application, and get potentially blocking issues to automation raised up and addressed as early in the project as possible.

2. **Recording Tests:** KMG graphically records each step it will perform as it navigates through the application. A step is any user action that causes or makes a change in the web site, such as clicking a link or image, or entering data in a form.
   When tests are recorded, the scripts are generated by automation tool

3. **Verify and Enhance:**

   - Inserting Verification Points into the test will enable the search for a specific value of a page, object or text string, which will help in identifying if the application is functioning correctly.

   - A spreadsheet shall be created for each test wherein test data and verification points shall be entered. Verification points are nothing but the expected data which are required to be put in the spreadsheet. Below is the snapshot of the spreadsheet for reference:

   - Broadening the scope of the test by replacing fixed values with parameters will allow checking the application performing the same operations with multiple sets of data.

   - Adding logic and conditional statements to the test enables addition of sophisticated checks to the tests. The recorded test script needs to be modified in order to replace the fixed value with the data from spreadsheet.

4. **Running Tests:** KMG runs a test to check the behaviour of the application and ensures one successful execution. While running, Automation Tool connects to the application and performs each step in the test as

per the spreadsheet. After the successful execution, Automation test script shall be added to automation test pack.

5. **Analyzing Test Results:** KMG examines the test results to pinpoint defects identified in the script and modify the test scripts and then re-run the test script, if required.

The application was in the maintenance phase and agile development model was followed and a new release was made available to testing team after every one month, therefore script creation phase was repeated after every one month to create the automation scripts of new enhancements.

1.4.2 KMG AUTOMATION APPROACH FOR TEST EXECUTION
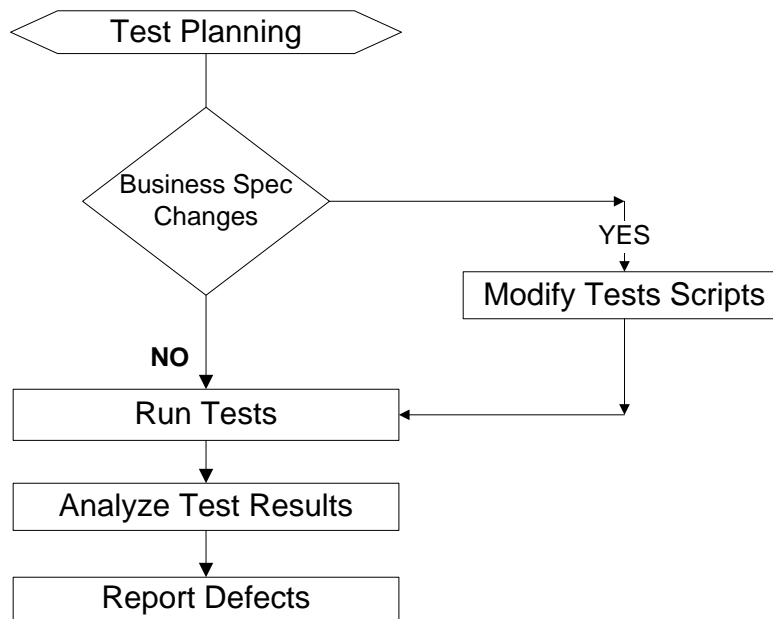
1. **Test Planning:** Prior to executing the test scripts, a detailed test execution plan is created which highlights the number of test scripts to be executed in that Test execution cycle for a particular test environment.

2. **Modifying Tests:** Modification in the automation tests scripts, if required, is done in order to incorporate the changes in the business specifications of the application.

3. **Running Tests:** As the test scripts and spreadsheet are ready, KMG reviews and update the data to be tested with regard to the spreadsheet and run the test.

   KMG executes all tests identified for that particular test execution cycle for any number of sets of data.

4. **Analyzing Test Results:** KMG examines the test results to pinpoint defects in the application that are identified by the automation scripts.

5. **Reporting Defects:** KMG raises the defects in the "Defect Management Tool" as it encounters failures in the application when analyzing test results.

Test execution phase was repeated every month when a new release was made available to testing team to perform the regression testing on functionality of all previous releases.

1.5 DURATION OF AUTOMATION PROJECT

The customer is using automation solution of QTP for last 4 years.

2 CASE STUDY ON UTP

KMG has successfully automated the application for one of the esteemed client by using **UTP**. KMG's automation experts were involved in Automation planning, creating scripts, executing scripts and report generation.

2.1 ABOUT UTP

Unified TestPro (UTP) is a web based, collaborative test automation tool. UTP can be accessed by teams that are geographically distributed. UTP server is hosted centrally and various web clients who could be Test Designers, Test Automation engineers, and Test Executors can access and work synchronously from different locations on the same test automation suite.

UTP follows Keyword Driven Approach that simplifies Test creation and maintenance. It allows scripting of Test Cases using a set of Keywords provided as a part of framework. This approach saves time and money in Test Design, Test Automation, and Test Management. The amount of code needed to create Test Automation is significantly reduced, easing the burden of future maintenance. UTP supports Technologies like Windows, Java, Web applications, Dot Net, Eclipse, and Activex etc.

2.2 CUSTOMER/APPLICATION DETAILS

The customer is a retail/restaurant group. Following are the modules of the application developed for the customer:

- **POS**: Point of sales system will provide the sales system to Restaurant/Non Restaurant establishments. It will allow the POS user to handle the order of the customers (Walk in, Delivery and online), manage inventory and manage reservations.
- **Food to Eat**: Food to Eat user can search a Restaurant by Name, Location, Dish Name, Price Range, Cuisine etc., and place online delivery orders and make payment from this module. User also has the option to view Dish & Restaurant profile, Restaurant menu, past delivery orders, Add to favourites list and review & enter comments.
- **Seek a Table**: Seek a Table user can search a Restaurant and make online reservation using this module. Ser can search a restaurant on the basis of location of the restaurant, special events hosted, cuisine etc. and then make reservation.

2.3 BUSINESS PROBLEM

Challenge

The Customer did not have any prior experience in the Testing automation. The main challenges thrown by the application were unique in terms of custom controls on the application. KMG therefore provided a demo on the existing application by automating few test scenarios and that demo helped the customer get an idea on how the business would get benefit after automating the application. Solution provided by KMG helped manual testing team concentrate on testing the new features by taking the complete load of regression testing on test automation suite.

2.4 TOOL SELECTION

KMG Automation team studied the client's application and functional specification and then presented two automation tools - QTP and UTP. These two tools were further compared in terms of compatibility against the product under test. The client's application was completely web based developed on .Net technology with no requirement of mainframe testing. After comparison it was found that both tools were equally good for automating the web application but from license cost perspective, UTP was much cheaper than QTP and therefore KMG recommended using UTP.

2.5 KMG AUTOMATION APPROACH

KMG provided the automation testing solution in 2 phases; Creation and Verification of test scripts and Execution of test scripts:

2.5.1 KMG AUTOMATION APPROACH FOR SCRIPT CREATION
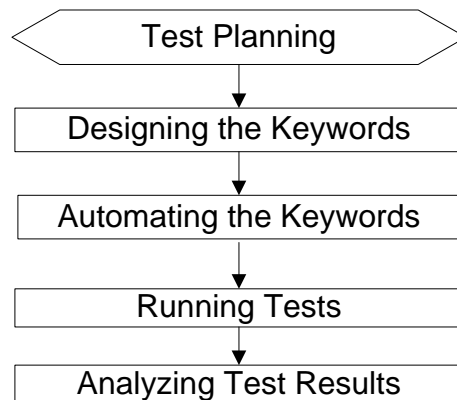
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        Designing the Keywords
                 │
                 ▼
        Automating the Keywords
                 │
                 ▼
           Running Tests
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        Analyzing Test Results
```

1. **Test Planning:** KMG describes the test in detail prior to automation. It includes the exact steps to be followed, data to be input, and all items to be verified by the test. Test planning includes following activities:

    - Setting up Automation Test Plan and Strategy and estimating the time, effort and capacity needed for Automation
    - Senior Automation Experts start working on designing the keywords and automating the keywords through Interface driver.
    - Also started ramping up core team members on Automation tool and application. This immensely helps in scaling up the activity for Test Automation once framework is ready.
    - It is expected that questions, data issues, and application issues will be encountered and need to be addressed.
    - This phase in the automation approach is intended to clarify the test cases to be automated, familiarize the automation team with the application, and get potentially blocking issues to automation raised up and addressed as early in the project as possible.

2. **Designing the Keywords:** Keywords are the basic, reusable building blocks for test design. Keywords define actions that drive or get information from application objects. Keywords are defined with an action-descriptive name (e.g. Login, Enter Reservation, or Validate Reservation) and argument descriptions (e.g.

Username, Password). Each Keyword (for GUI applications) is associated with one or more GUI windows. Each Keyword argument is associated with a window object. Reuse of keywords ensures rapid test development and easy maintenance.

Keywords are created by Test Designers for use within Keyword Test Cases or on-demand as needed when the Keyword Test Case is implemented. Keyword argument values are selected to serve the purpose of the test case. The values are text and can be an explicit argument value or an expression.

Test Cases are designed as a sequence of Keywords with arguments and values. Once implemented and executed, a Keyword Test Case will validate that the Application produces the expected result following input of the specific conditions designed into the test case.
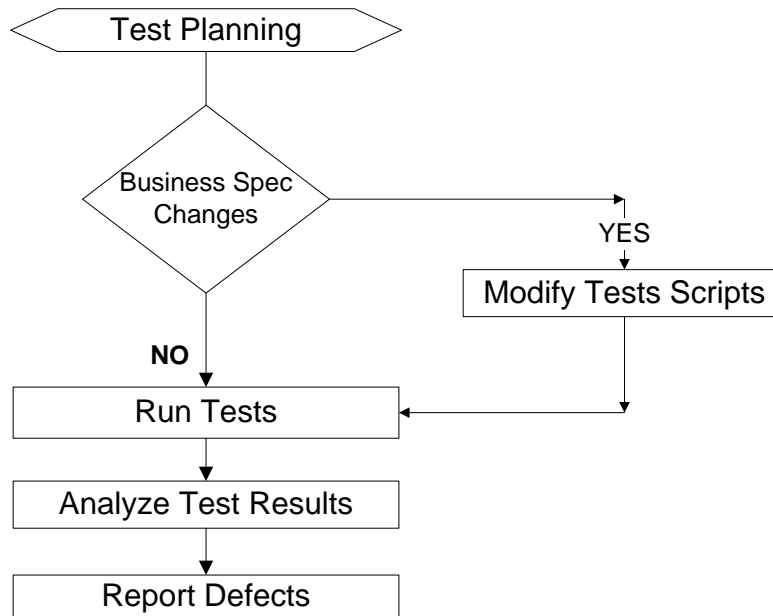
Keywords
Keywords are the basic, reusable building blocks for Test Design. Keywords define actions that drive or get information from Application Under Test (AUT). Reuse of keywords ensures rapid test development and easy maintenance.

3. **Automating the Keywords**: Automating the keywords involves the process of mapping the GUI objects with the keywords arguments. The automation engineer captures the AUT in GUI files, which is then mapped to the keywords. Mapping is a step required to identify application windows and the objects on them. The Automation engineer uses the GUI Mapper which is available with the interface driver to capture the AUT window. The interface driver also provides facility to the Automation Engineer to add code to any keyword if required.

4. **Running Tests:** KMG run a test to check the behaviour of application and ensure one successful execution. While running, Automation Tool connects to the application and performs each step in the test as per the test case. After the successful execution, Automation test script shall be added to automation test pack.

5. **Analyzing Test Results:** KMG examines the test results to pinpoint defects identified in the script and modify the test scripts and then re-run the test script, if required.

The application was initially in the development phase and spiral development model was followed. During that phase, new release was made available to testing team after every one and half months. So, automation script creation phase was repeated after every one and half months to automate the manual test cases. During maintenance phase, automation script creation phase was repeated after every fifteen days to create the automation scripts of new enhancements.

2.5.2   KMG AUTOMATION APPROACH FOR TEST EXECUTION

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1. **Test Planning:** Prior to executing the test scripts, a detailed test execution plan is created which highlights the number of test scripts to be executed in that Test execution cycle for a particular test environment.

2. **Modifying Tests:** Modification in the automation tests scripts, if required, is done in order to incorporate the changes in the business specifications of the application.

3. **Running Tests:** As the test scripts and test cases are ready, KMG will review and update the data to be tested with regard to the test cases and run the test.

   KMG executes all tests identified for that particular test execution cycle for any number of sets of data.

4. **Analyzing Test Results:** KMG examines the test results to pinpoint defects in the application that are identified by the automation scripts.

5. **Reporting Defects:** KMG raises the defects in the "Defect Management Tool" as it encounters failures in the application when analyzing test results.

Test execution phase was repeated after every one and half months during development phase and after every fifteen days during maintenance phase to perform the regression testing through automated test scripts on functionality of all previous releases.

2.6 DURATION OF AUTOMATION PROJECT

The customer is using automation solution of UTP for last 1.5 years.