



**Automated Function Testing  
powered by Pactera**

**MARS Technical White Paper**

**Pactera Technology International Ltd.**

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# 1. Introduction

## 1.1. Project Background

At present, automated test tool on the market, most product are based on data-driven scripts for testing. The testers need have stronger development script ability, even though the product are known as very easy script, Such as VBScript, JavaScript script language have higher requirement, When the tested system change, alter and calls the test script spend a lot of time, greatly reduce the efficiency of automatic test preparation work, raise the difficulty of the test, at the same time, develop the cost of the test.

To reduce the work strength for the testers, develop the success rate of the test case, execution rate, and generate test reports rate, perform no script automatic testing, reduce the cost of the automatic testing, raise the efficiency of the automatic test. In our past experience from client test service, and analyze the advantages and disadvantages of the various automated test products on the market. We development MARS automatic test software are based on automatic test trend market, it is used in the software system's function test and regression test.

## 1.2. Automatic Function Testing Introduction

Automated Function Testing is the use of automated test software to perform functional testing for the tested product, according to test plan and test process. In the early test, according to the test analysis and design process to generate the test instructions, to make engine to perform the relevant operation and verify, verify the tested system whether meet needs, or make clear the difference between the expected result and the actual result. In test have finished, though automatic testing software to analyze and evaluate possible problem for the test program, fault trace to ensure that the tested system is suitable for requirements. In the entire process, automation replaces manual operation, guarantees quality and reduces human-cost.

## **2. Technology Feature**

### **2.1. Applicability**

MARS choose and construct a serious of the highly flexible extensible technology framework. it based on Java & .Net language development , use E4 plugin development technology , guarantee the extensibility of the software. according to the different customers personalized needs to customize development become possible, and provide guarantee for a varies of product integration platform in future.

Manual regression test need abundant human, raise human-cost, if manual regression test for save cost, reduce test, raise the unknown error risk, this addition ,the demand side and service side don' t want to see. in reality work may arise problem, use this software can perfect solve, MARS can achieve the high efficiency of the automatic test regression ,compare test results, more lower test cost, prevent from modify the new errors in program.

### **2.2. Automatic Function Test**

Automatic function test is core of this software. the function test is a black box test for the functional requirements of the tested object system; as the beginning of the users maybe exist the functional requirements , according to the system design and development 's requirements to perform test analysis, test design, automatic test running, draw the visual the business process after analysis. Draws the business flow chart, can be automatic create the test cases, no script in entire process. according to the test case to test for the function. Obtain the tested software 's errors and defect tracking report, and feedback to the developers to help them quickly identify problems , modify errors, and improve software quality.

## 2.3. Automatic Regression Test

Software development are customer-oriented, at the same time, customer' s requirements are constantly changing, When modify the software' s error, usually lead to the new error. according to incomplete statistics in industry, A mistake is likely to be introduced for every three errors. Even though modify a little part of code in program, it has unknown error risk. The way to prevent from unknown error risk is regression test.

Usually manual regression test requires a lot of human-cost. So the increasing cost is a big problem to the test team. But in order to save costs test team always reduce test in actual process. So this increases the risk of unknown bugs. This is not an optimal situation. Using MARS will solve this problem. Execute the test cases automatically for regression testing. Reduce the team cost, and reduce the risk of unknown error in the software program.

## 2.4 .Project Feature Introduction

### 1. The core of engine

- This software as an automatic test software, using the combination of independent and mainstream as the core of this software.

### 2. No script operation in entire process

- No script visible edit test case in entire process, the testers don' t need script programming experience, save the human cost, reduce the tester' s working strength.

### 3. Visual draw the test case

- In reality, the test cases are written ,according to the different business requirements, but for have edited test cases can not to visually understand the business process, after the abundant test cases accumulated, according to the different business requirements, draw a varies of the test cases, it can classify for the test cases. Selected have existed test cases, it can highlight the test case 's business process.

### 4. Page elements discern function

- Testers don't need understand coding technology, via the software's discern elements function to discern page elements property, for the special tested system, it also can be through image picker to obtain elements in page.

## **5. Verify**

- Because this software's test includes a number of verify, so as an automatic testing software ,it is necessary for has a perfect verify function, this software can accurate verify a varies of control and content in the page, for example, control whether visible verification, availability verification, null verification, database data value verification and so on, it can be verify and multiple verify.

## **6. Standard function calls**

- This software encapsulating a series of standard functions , it is used in testing process for the testers, include the processing of string , date, and so on.

## **7. Parametric**

- This software provides parameterized function of different effect area, after the test case parameterization, ,the users can still alter manually to achieve the edit parameter work.

## **8. Customized**

- This software provides unionization development interface "MARS API Gateway" , according to user 's individual requirements to develop the test action of the customized development.

## **9. Product design aim in future**

- We plan to develop shared test based on Cloud , at the same time , we will actively create the design and development of MARS-Manager' s management module to perform from management to implementation in the whole control.

# 3. System Feature and Require

## 3.1. System Require

### 1. Hardware - Workstation、 Agent

- Hard Disk: Above 80G
- CPU: Above Intel i3-2120
- Memory: Above 4G

### 2. Hardware - Controller

- Hard Disk: Above 80G
- CPU: Above Intel i5-3470
- Memory: Above 8G

### 3. Software

- Operating System: XP、 Windows 7、 Windows 8、 Windows 8.1、 Windows 10
- JDK version: Above jdk7.0
- .Net Framework Environment : 4.0
- Database: MySql 5.0
- Browser: IE8/IE9/IE10/IE11/edge/Chrome/Firefox/
- Mobile device test support : Adroid, iOS System

## 3.2. System feature

This software requires a little higher computer memory, others function requirements are not high, the automatic test of the script execution speed, more than the speed of manual execution.

## 3.3. Reliability and Usability

This software has a stronger processing ability for itself error, in other words, When its appear error, it has a perfect processing mechanism, it can show the location and the reason in console area, it can continue to use normally. This software has a strong self-checking function, for create the test cases, it can be the regularity of the check, if editing test case have error, it shows specific positioning

errors and location in the prompt error message window. The testers can quickly modify the errors .

In run the test process, If an error occurs, the program can skip this test case, continue to perform others test cases , even though others test cases is abnormal, correctly test case can execute.

After the software 's version upgrade, for the previous test case, it still can be continue to use, strong compatibility of downward.

### **3.4. International Support**

The software interface supports Chinese/English/Japanese. Test result report also supports Chinese/English/Japanese, according to the language require, MARS provides customizing language.

## **4. System Basic Function**

### **4.1. Create and Record Test Case**

Testers can use the new function to create 【Test project-Test module-Test Scenarios-Test Case】 , this structure classification can the testers to better manage test cases , structure is clear , for every level, we provide extended function , such as modify the name, generate the test data, and running all the test cases below the level and so on.

### **4.2. Edit Test Case**

For have existed test case, we can add ,modify the wanted operation elements, and concrete operation, because of no script in entire process, the testers don' t need consider the script problem, directly edit test cases.

### **4.3. Edit Run Config**

According to the business requirements, the scattered test scenarios and test cases are set up to meet the running configuration of the requirements, reduce reduplicate work , improve the reusability of the test scenarios and the test cases.

### **4.4. Test Case Execution**

This software provides the run config function of the test case execution ,It is convenient for users to perform individual test cases, or test group, according to the test requirements. Testers can directly according to the test automatic development cases related to the system object module test, scenarios test or project test, according to the test plan and test plan custom all kinds of test level combination of the test suite, it can also the purpose of the corresponding test.

### **4.5. Test Result Report**

The end of test case execution can generate a variety of test results reports for users to analyze, track problems and improve test quality. The test report supports the Chinese / English / Japanese languages. The test report can also be customized to meet the customer's personalized requirements for the form and content of the test results report.

## **5. The feature of the software**

### **5.1. Raise the Productivity of Test Case**

The traditional way to create a test case manually of time cost is this software the cost of 3-10 times, traditional manual create test cases need the certain of cost, how to reduce the cost of actual test work to establish the cost of test case, is the beginning of the software design is considered the key.

The advantage of this software is : first, automatic identification of page element function . For elements that can' t be imported, it can be imported their images.

After the import is complete, it can automatic adapt to all kinds of situation. Second, visual draw test case, make testers see what their get.

Flexible use the copy function. It' s convenient to achieve the similar test action, test case ,test scenario , test module , test data , quickly create the similar test action, test case ,test scenario , test module , test data . at the same time, the parametric function of test data are greatly simplify the workload about the different types of the test data preparation.

## **5.2. User requirement**

User needs to understand HTML , but it need not to program experience ,and need not programming languages, such as VBScript、 JavaScript , this software can still be used for testing.

## **5.3. Maintain the Test Property**

Test case have finished, as the tested system' s modify and update, it need to maintain the test case library, so existing cases maintenance is particularly important.

Because the software is no script in entire process, maintain the test cases is very convenient, you just need to edit in the software. For edit the test case , this software provides function, such as: copy, paste, delete move up , move down and so on.

## **5.4. Edit Data Case**

Usually use the test case' s data, depend on EXCEL to run , test action and test data cost a lot of work for the tester , for this problem, the beginning of the software has been considered ,create and edit the test case data in the software ,via the edit EXCEL ,import the edit data editor . and for a case , create multiple the test data, more targeted , avoid switch between the test software and data file ,reduce the workload by test cases.

## 5.5. Test Property Reuse

Test property : test case, test data , it is connected to the tested system' s version. With the upgrade of the application system version, test case also subsequently upgrade, the effect of regression test to maximize, for the test tools to ensure the test assets reusable, you need to ensure the compatibility of test cases. As the development mode and development technology is progressing, MARS is constantly changing, even though MARS function is constantly strengthening, MARS support backward compatibility ,makes the users test cases and test resources can be reuse.

## 5.6. MARS Extensibility

Use MARS run the test for some special cases. at the same time, improve the automatic test rate in the entire testing process , the software provides unionization development interface "MARS API Gateway" , if standard test function can' t satisfy custom wants, user can use "MARS API Gateway" to execute custom function development

# 6. Supports

MARS website provides the project 's Installation Guide and MARS Usage Manual ,according to the software' s version.

We have a strong team Technology, solve the problem in actual applicate, quickly return (within 2 hours) and provides a solution(within 48 hours).

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