

# 自动化测试解决方案

方案撰写：许玉波

版本： **V2.0**

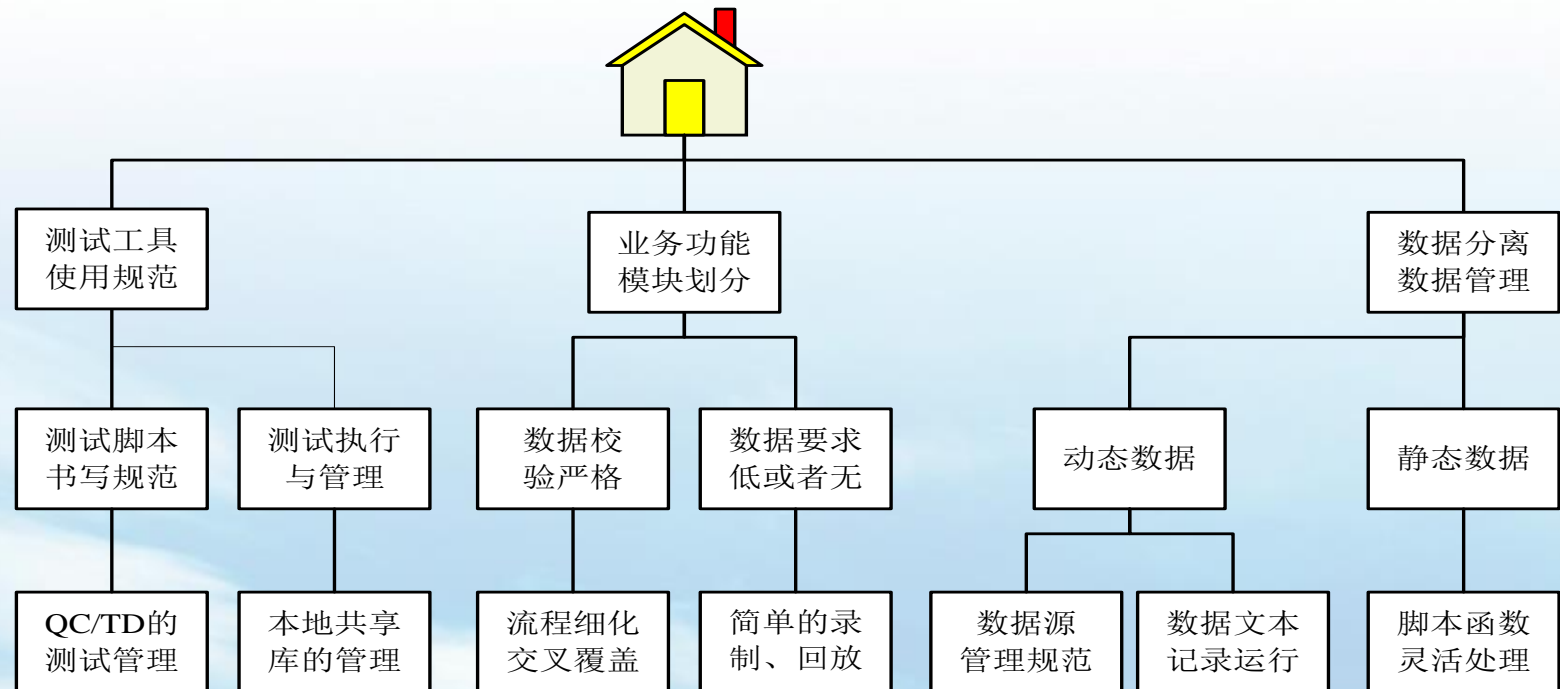
撰写时间： **20130621**

# 自动化测试框架

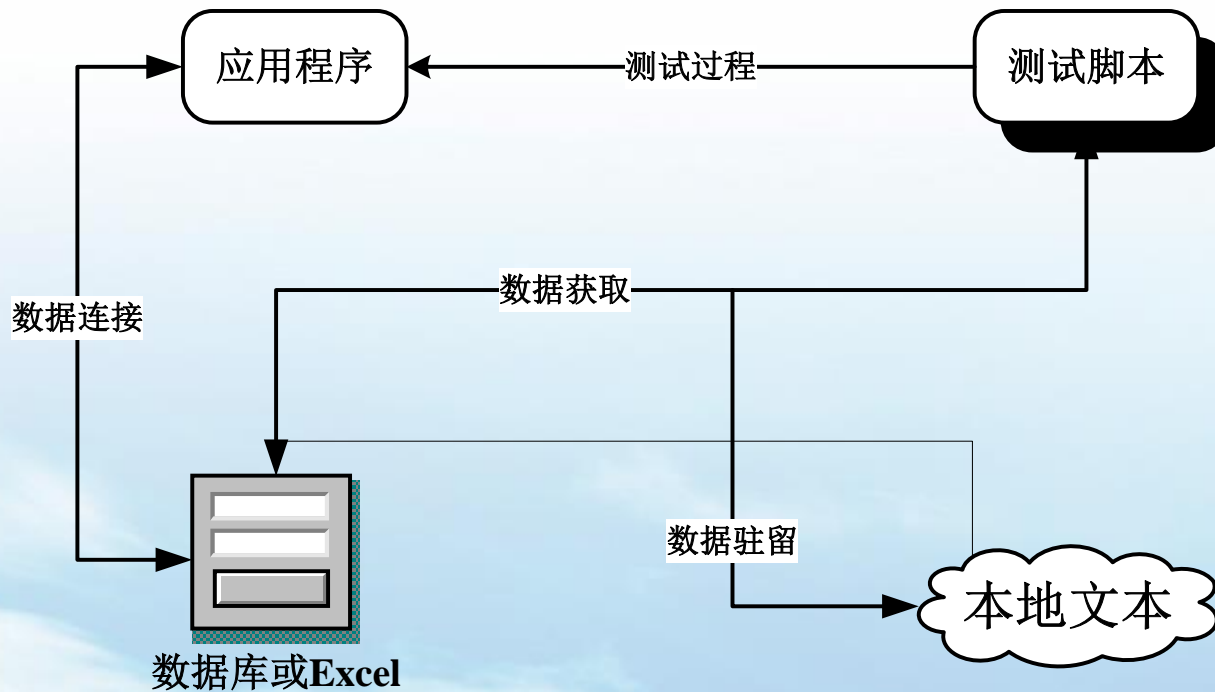
- 1: 测试工具: QTP + HP\_QC(ALM11)
- 2: 脚本生成原理: 模块化脚本, 做到脚本可重用, 用以维护, 投入产出比高
- 3: 数据脚本分离:
- 4: 框架级公共函数库;
- 5: 项目级公共函数;
- 6: 批量运行脚本;

# 自动化测试框架

- 测试工具使用规范、业务功能模块分解、测试数据分离与管理



# 测试数据使用流程



# 目录

1. 测试设计

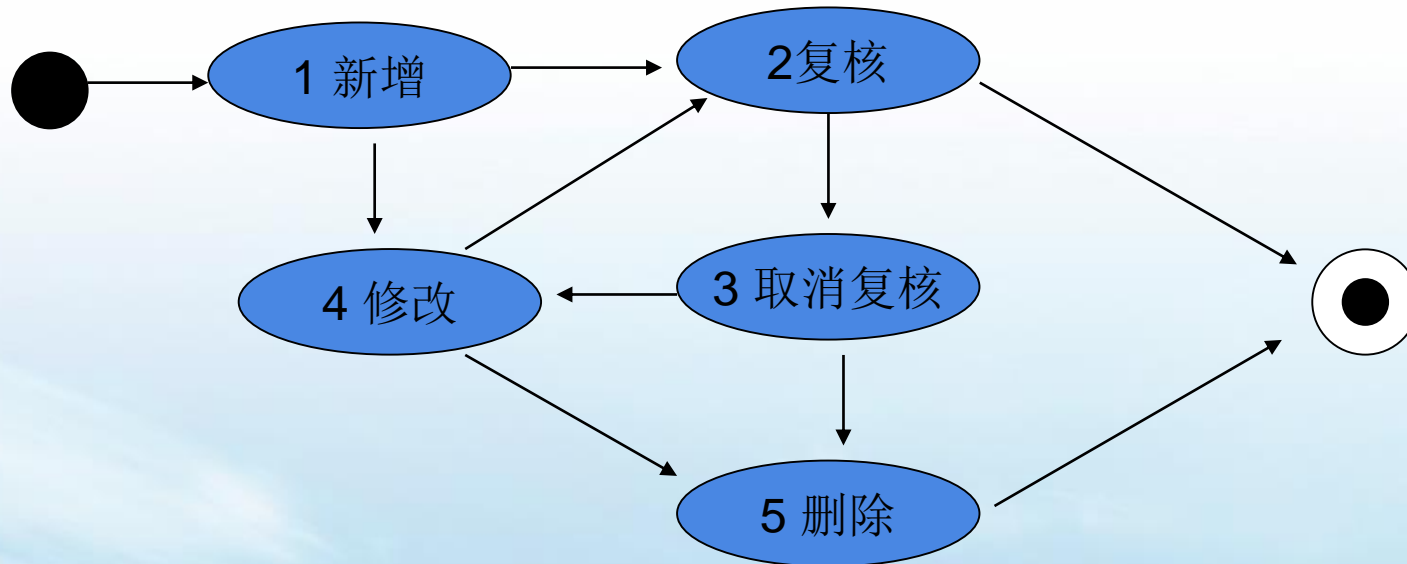
2. 测试实现

3. 测试执行

# 测试设计——设计测试用例

现在要针对系统业务（银行付款）业务设计一个测试用例，进行功能的覆盖

## 1： 划分业务功能、画出业务流程图



# 测试设计——设计测试用例

## 2:确定业务数据

准备测试数据

## 3:在QC中录入测试用例

访问QC服务器，如：<http://....>



# 测试设计——在QC中录入测试用例

在“Test Plan”新建一个文件夹，用来存放测试脚本

HP Quality Center 10.00 - Windows Internet Explorer provided by QVC, Inc.

http://vpwf1093:8080/qcbin/start\_a.htm

File Edit View Favorites Tools Help

Quality Center Domain: QC\_QVC, Project: ECommerce, User: 00915314 Logout

Tests Edit View Favorites Analysis

Management Requirements Test Plan Test Resources Test Lab Defects Dashboard

Details Design Steps Test Script Test Parameters Attachments Req Coverage Linked Defects Dependencies History

Step Name	Description	Expected
Step 1	Pre-requisite: 1. Non-styled product number, with stock. 2. Existing good customer and a valid pin 3. No existing valid Credit Cards on account	All the pre-requisites are met before continuing.
Call <Nav_001_HomePage>	Call <Nav_001_HomePage> with the following parameters: browser=?_qvc_website=QA Lab	
Call <Search_ValidProductOrGroupItem_InStock>	Call <Search_ValidProductOrGroupItem_InStock> with the following parameters: product_num=J81050	
Call <AddToCart-Regular>	Call <AddToCart-Regular>	
Call <CartMaint-Speedbuy>	Call <CartMaint-Speedbuy>	
Call <CartMaint-Speedbuy-Signin>	Call <CartMaint-Speedbuy-Signin> with the following parameters: membershipnumber or email=36960923, membership=1111, see the submit_order_pg=?_ship_to=default	
Step 7	Test case expected results.	Order is placed - Check in Order History and verify the status is "Check".

Total Steps: 7 Server Time: 1/13/2012 1:14 AM

HP Quality Center 10.00

Start HP Quality Center... Qcmit005 - Remote... MbrMaint\_Addr\_Add... Thank you - Window... QuickTest Profession... ShipMethod\_UKnon... E:\Documents and S... 1:14 AM



# 目录

1. 测试设计
2. 测试实现
3. 测试执行

# 测试实现

测试实现，需要的内容

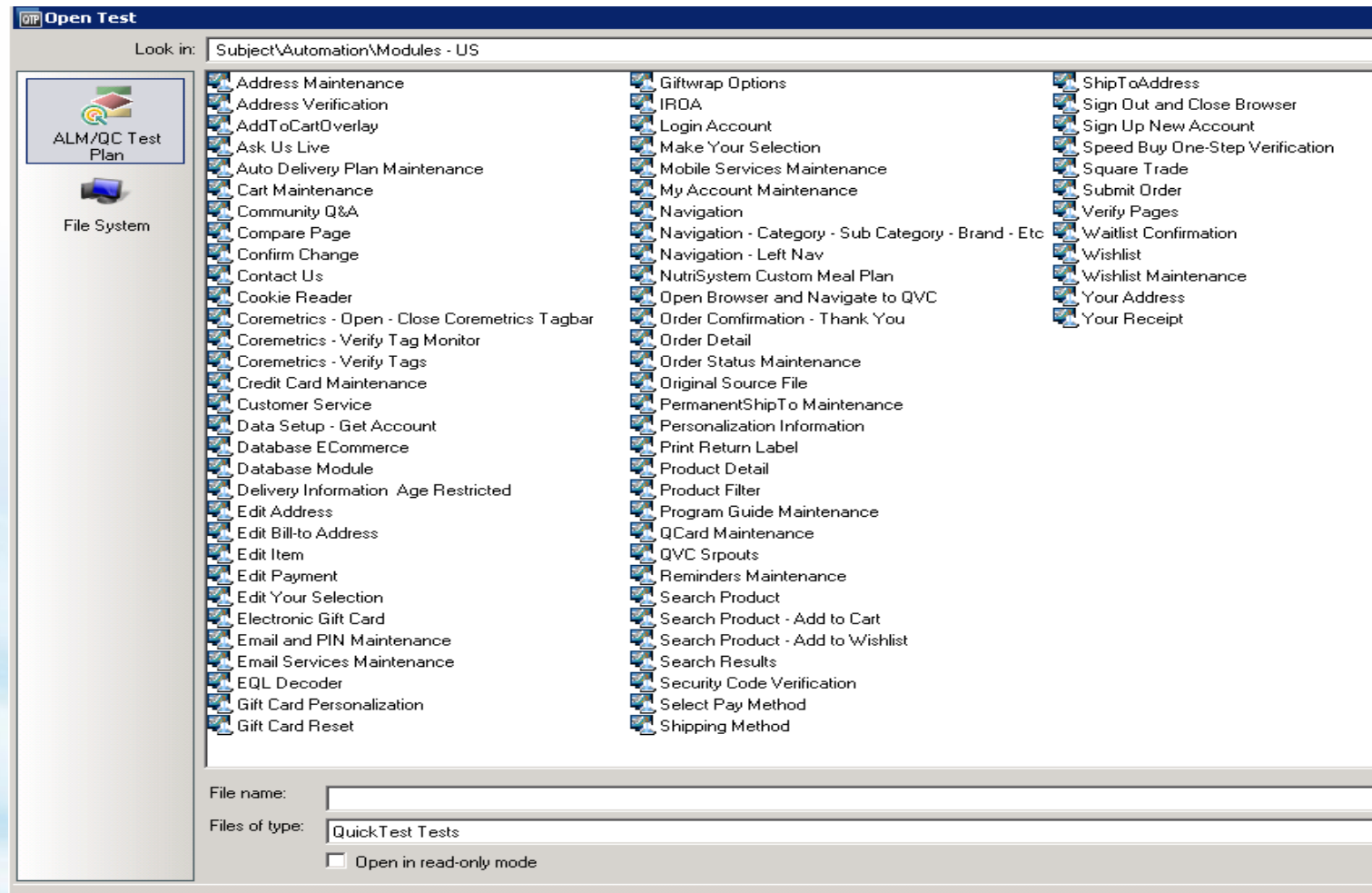
1: 测试用例的实现（**testCase Action**的实现）

2: 基础业务功能的实现（**reusable Action**的实现）

3: 公共**Function**准备

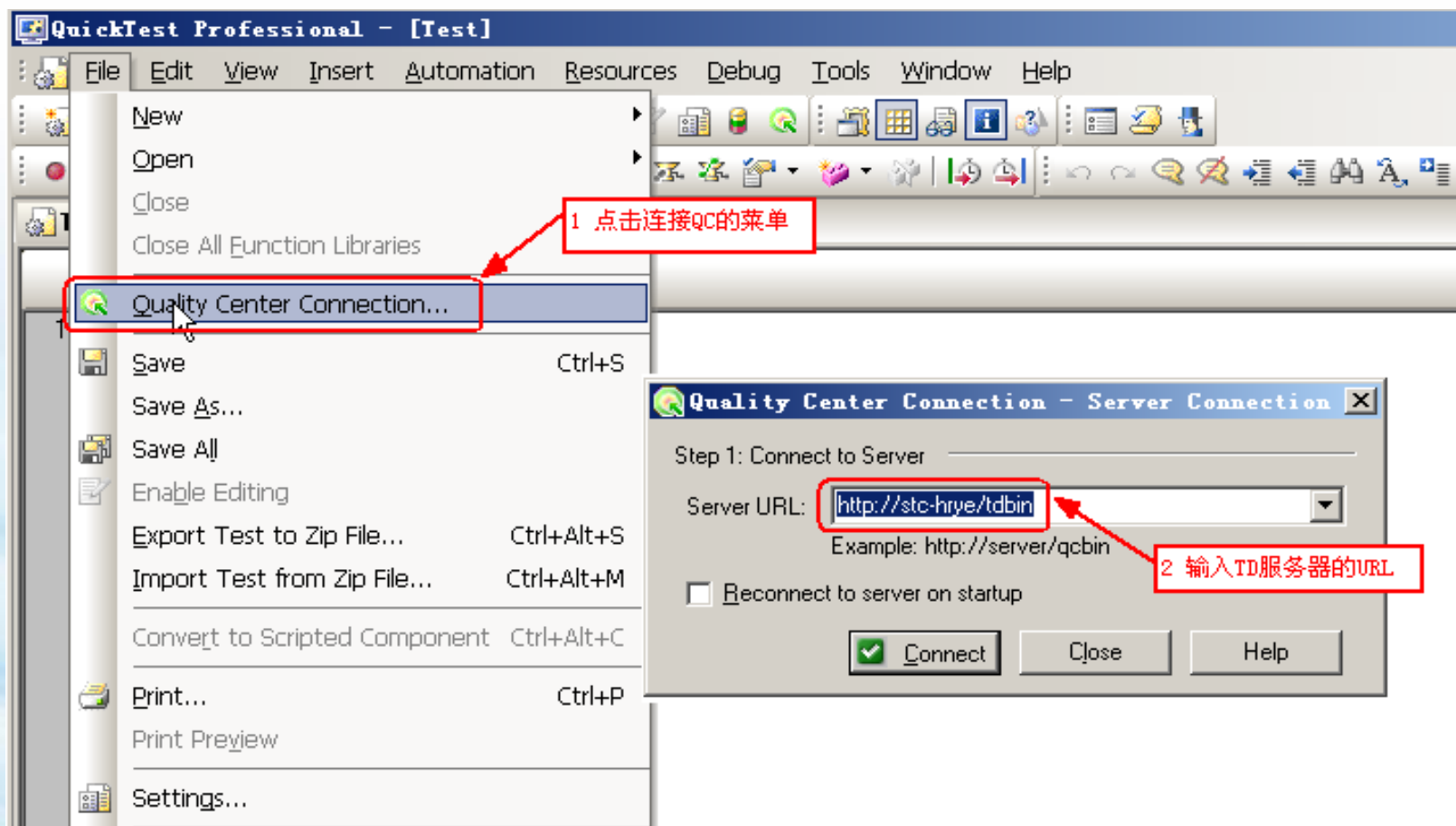
其中，**testCase Action**只调用**reusable Action**，每个业务功能如何实现，都放在了**Services Action**中。

# Services Action



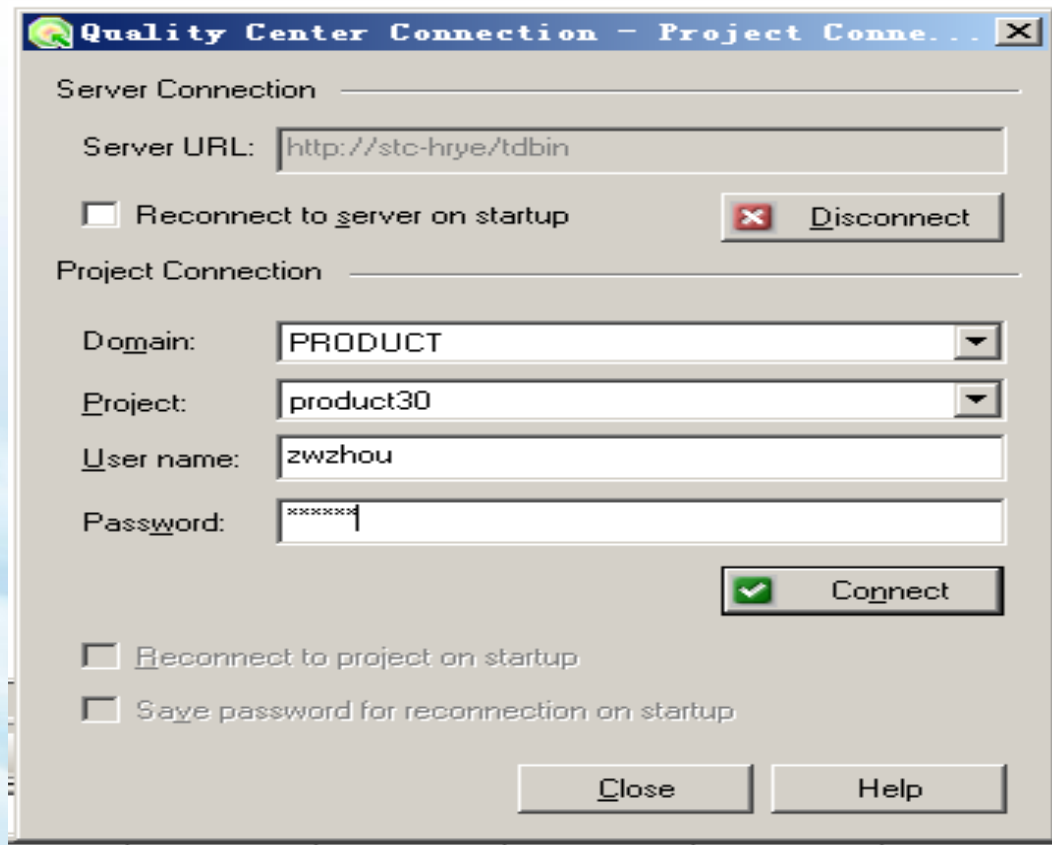
# 测试实现—实现testCase Action

## 1：使用QTP连接QC

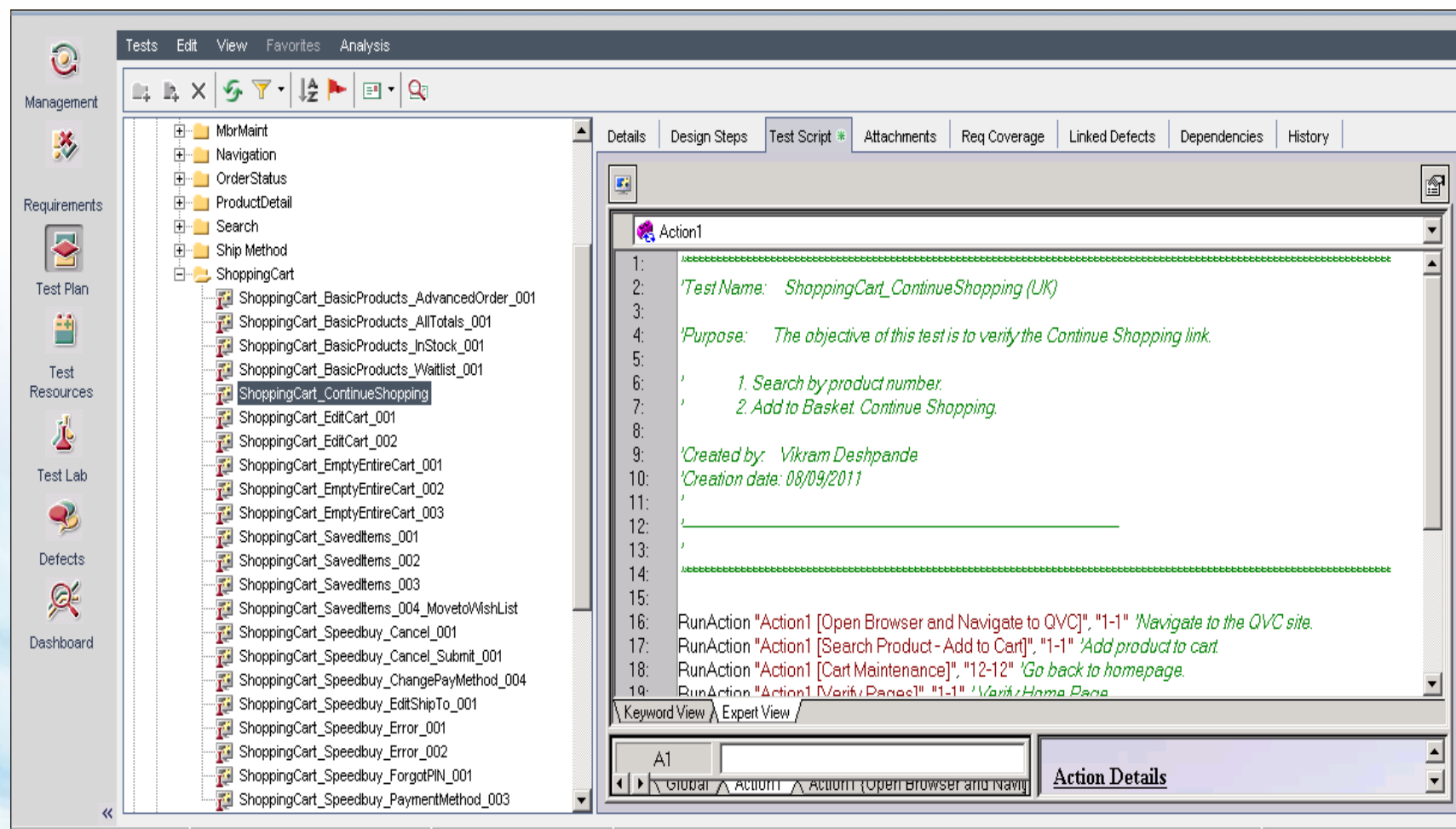


## 测试实现—实现testCase Action

- 2: 输入QC服务器的信息，并连接。
- 3: 打开要编辑的基础业务功能的脚本。

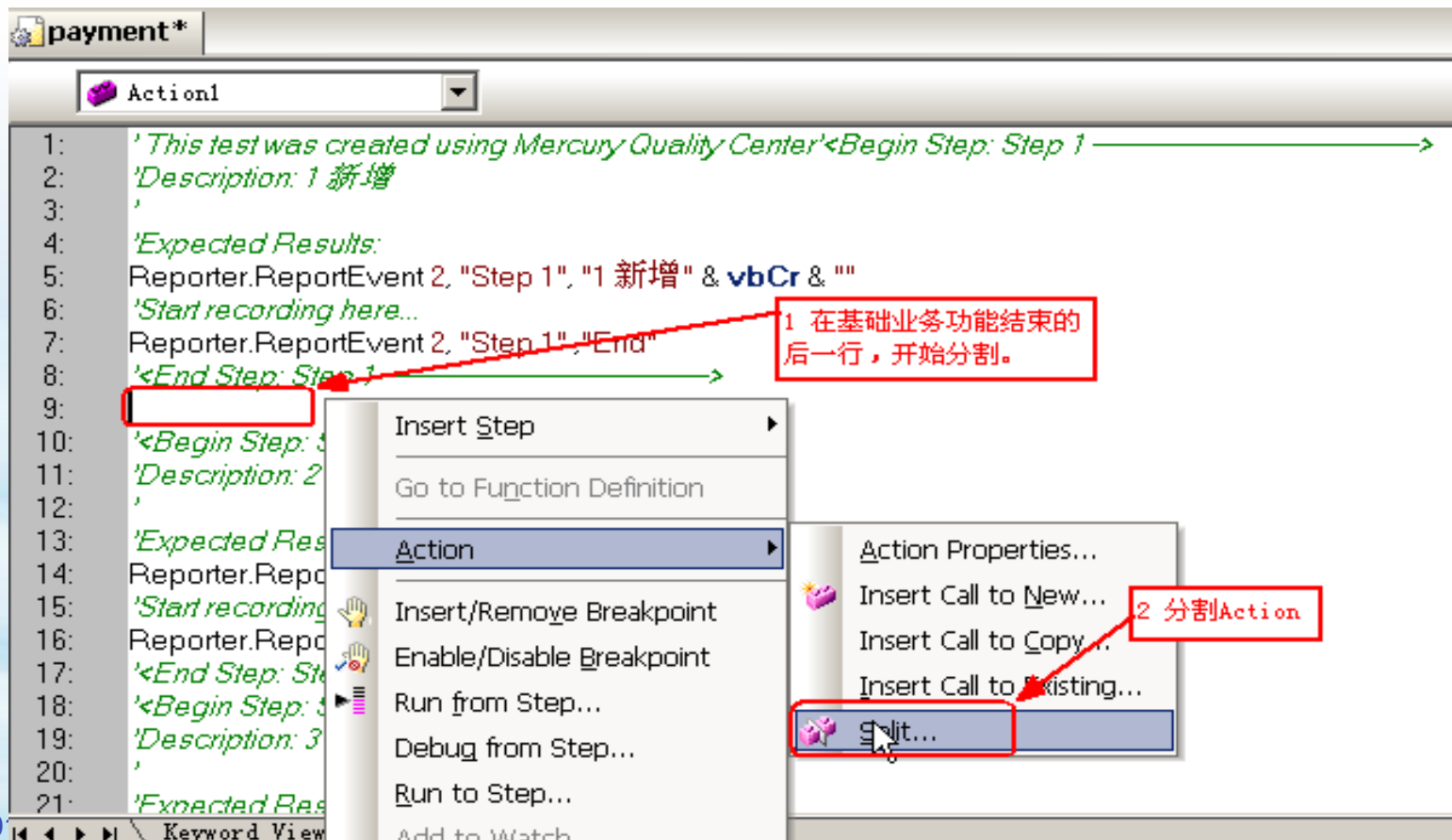


# 测试实现—testCase Action



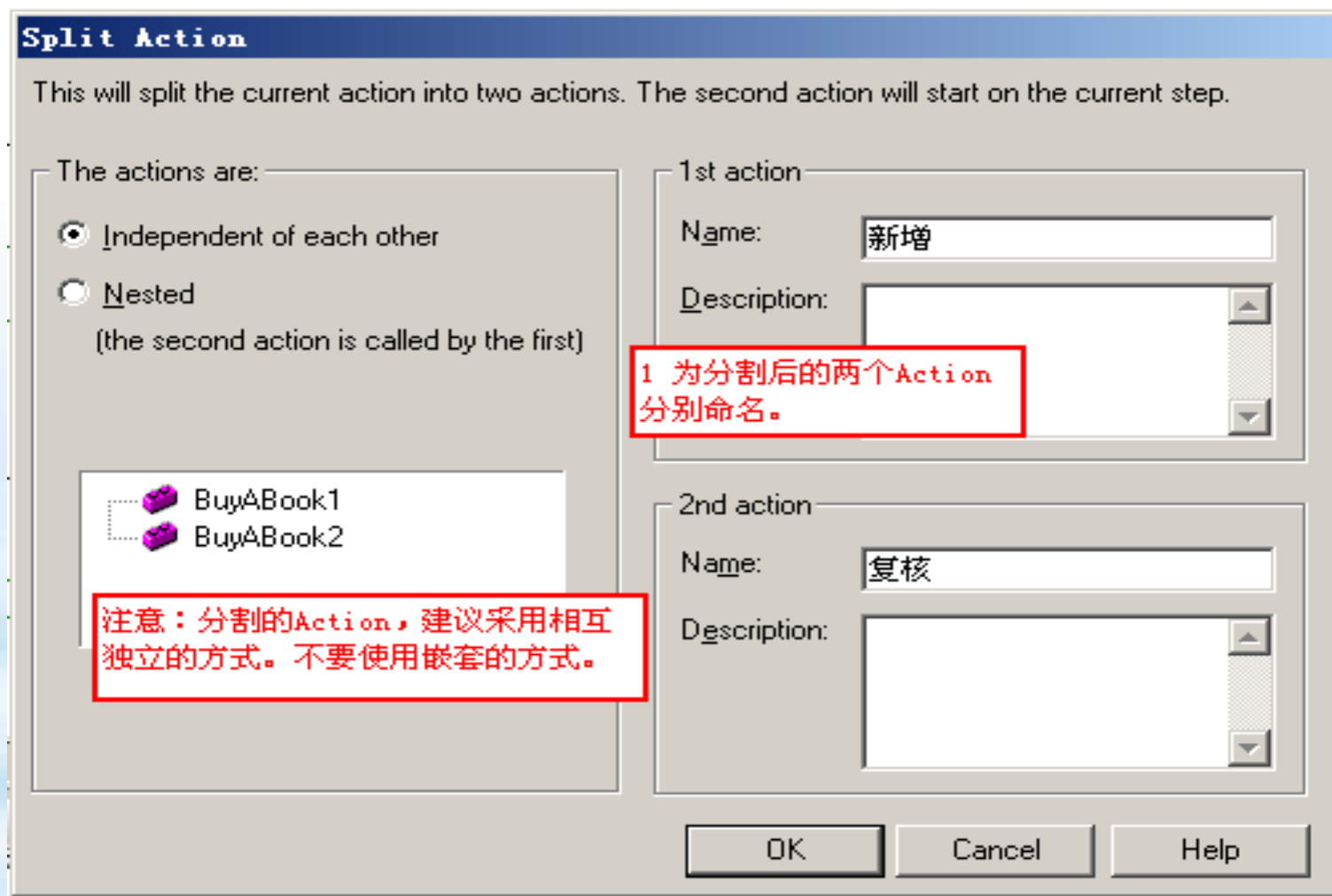
# 测试实现—实现testCase Action

- 4: 按照脚本的说明信息，将基础的业务功能脚本分割成多个 reusable 的 Action。注意：分割了的 Action，不能再合并。



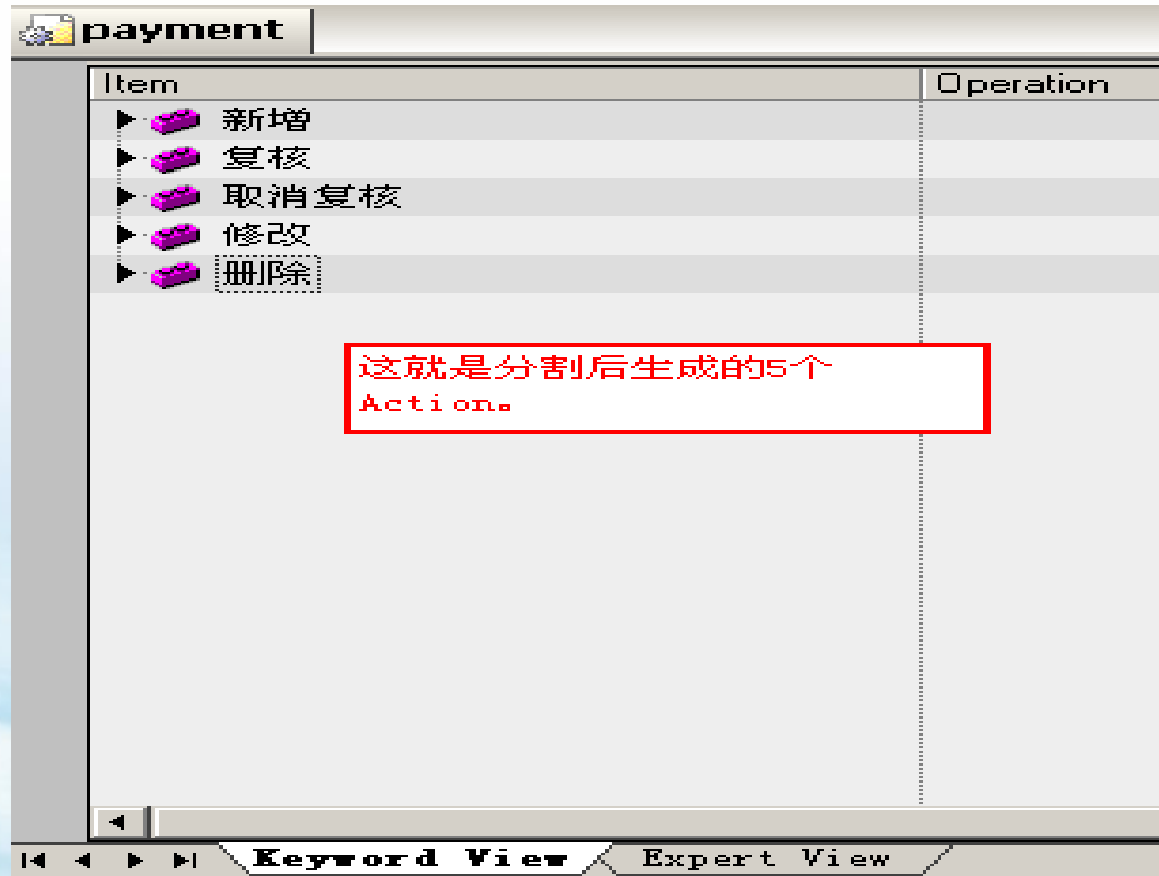


# 测试实现—实现testCase Action



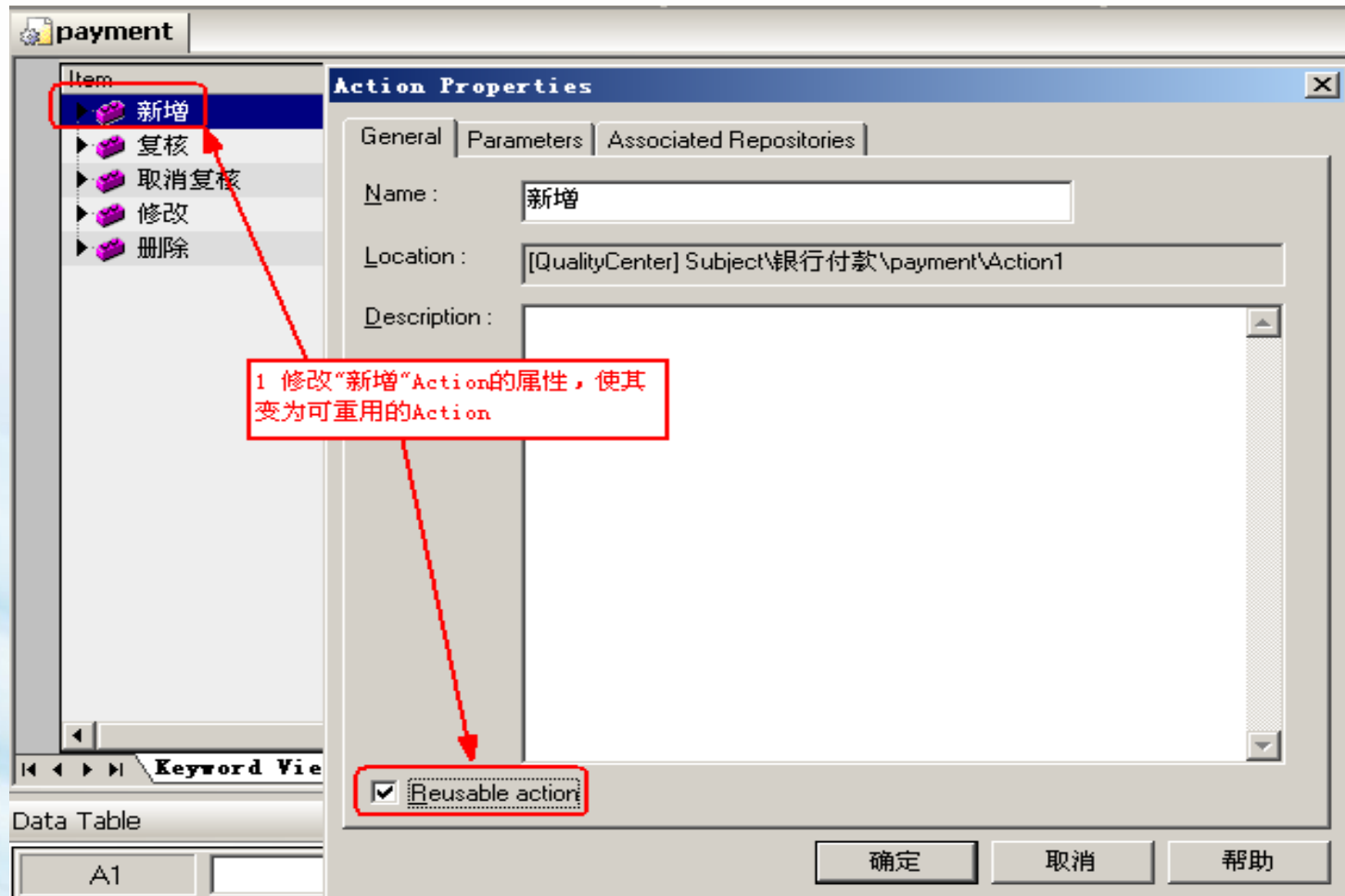
# 测试实现—实现testCase Action

依次，将所有的Action分割完成。



# 测试实现—实现testCase Action

## 5: 修改基础业务功能Action的属性，使其可重用

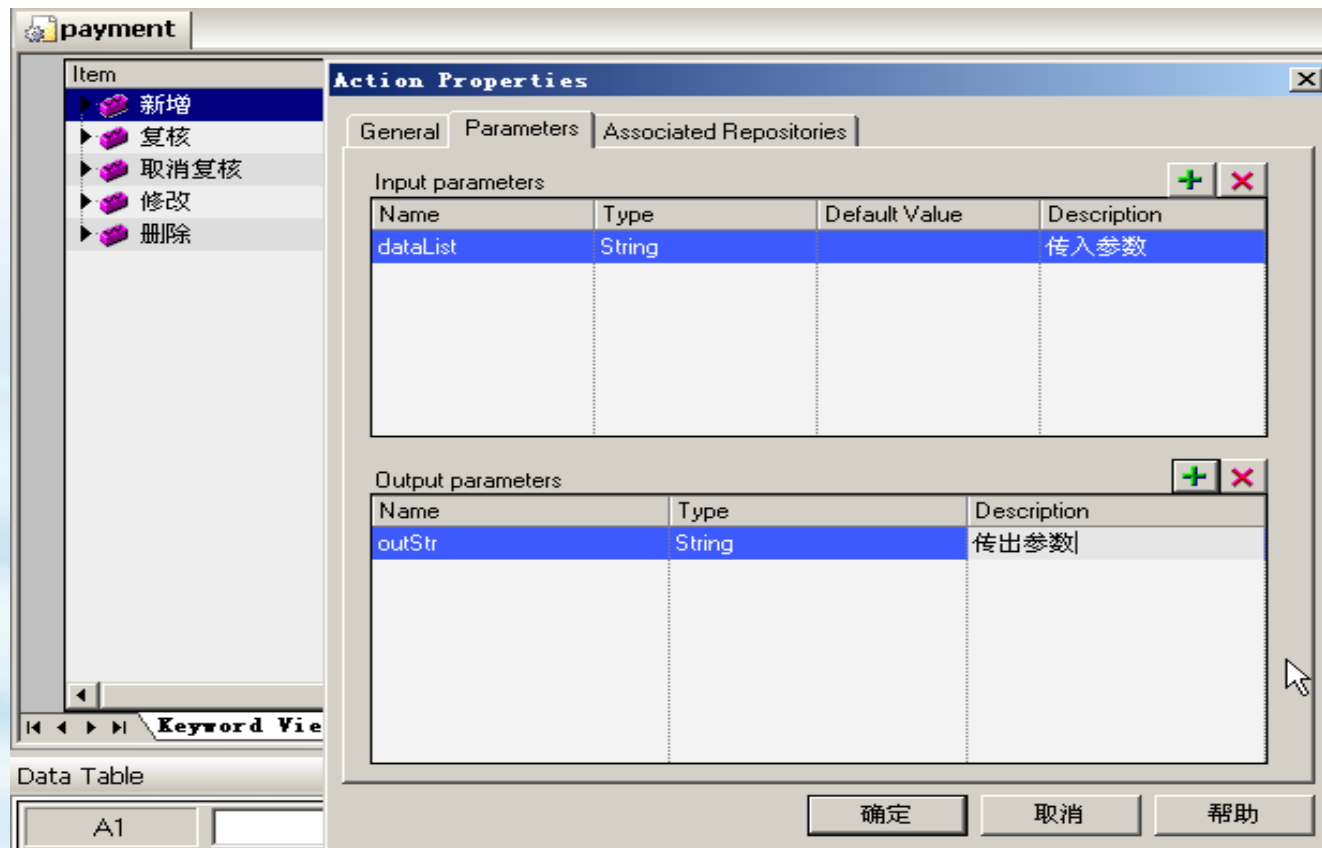


# 测试实现—实现testCase Action

6: 修改Action的传入、传出参数。

传入传出参数的数据类型建议只使用String型，且各只有1个。

传入的参数，是将数组转成字符串传入的，需要经过解析后才能使用。



# 测试实现—实现testCase Action

7 基础的业务功能的Action暂时就完成了,现在开始编写testCase。

The screenshot displays the HP Quality Center interface for a test case named 'CheckOut\_Basic\_001'. The main editor shows the test case details and a list of actions. Below the editor, a 'Data' table is visible, showing the first row of data for the test case.

**Test Case Details:**

- Test Name:** CheckOut\_Basic\_001(US)
- Purpose:** The objective of this test case is to verify the create order process with the following criteria:
  - 1. Verify Basic CheckOut
  - 2. Find by product number, add product to cart.
  - 3. Default ship method.
  - 4. Pay method using PayPal.
- This test needs to be ...**
- Created by:** JackXu
- Creation date:** 06/04/2013

**Actions:**

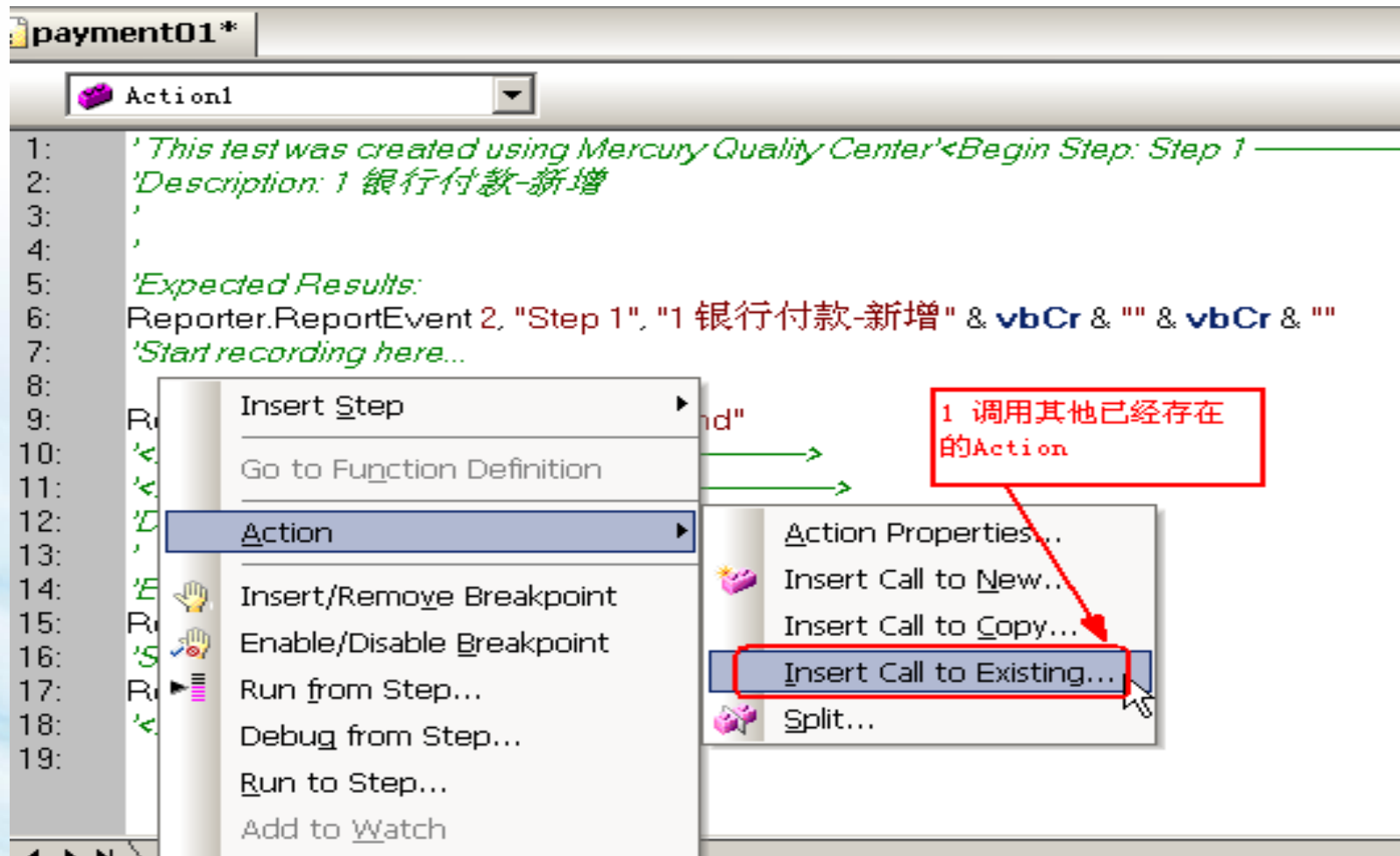
- RunAction "Action1 [Open Browser and Navigate to FP]", oneIteration, "LoginRegular" 'open browser and navigate to [www](#)
- RunAction "Action1 [Search Product]", oneIteration, "SearchByProductNumValid" 'Search by product num
- RunAction "Action1 [Product Filter]", oneIteration, "NavigateProductDesc" 'Navigate to Product Detail by click on the
- RunAction "Action1 [Product Detail]", oneIteration, "AddToCart" 'Add to cart - generic
- RunAction "Action1 [Cart Maintenance]", oneIteration, "CheckOutRegular" 'Checkout
- RunAction "Action1 [Login Account]", oneIteration, "LoginByEmail" 'Call this row to login with email
- RunAction "Action1 [ShipToAddress]", oneIteration, "UseCurrent" 'ship to current address
- RunAction "Action1 [Shipping Method]", oneIteration, "Default" 'Click continue button
- RunAction "Action1 [Select Pay Method]", oneIteration, "PayByPaypal" 'Click PayByPaypal
- RunAction "Action1 [Pay with PayPal Account]", oneIteration, "PayByPaypalLogin" 'Login with Paypal account
- RunAction "Action1 [Your Receipt]", oneIteration, "Immediate payment" 'Click Immediate payment button
- RunAction "Action1 [Order Complete]", oneIteration, "NavigateToHomePage" 'NavigateToHomePage
- RunAction "Action1 [Sign Out and Close Browser]", oneIteration, "LogoutCloseBrowser" 'logout and close browser

**Data Table:**

Notes	Action	Type
1 click on continue button to select the default	Default	Default

# 测试实现—实现testCase Action

8 切换到Expert View，调用“可重用”的Action



## 测试实现—实现testCase

**说明：insert call to copy... 与 insert call to Exists...**

假设要在ActionA中调用ActionB

**call** 是获得ActionB的引用，只是引用，如果原本的ActionB的内容发生了变化，那么ActionA中的内容也跟着变化，且不能在ActionA中对ActionB修改。

**copy** 是把ActionB的脚本复制到ActionA中，得到ActionB的一个copy，修改ActionB\_copy不对ActionB造成影响，修改ActionB也不对ActionB\_copy造成影响。

有点像C语言中的传指针和传值的意思。

另外，还可以去看编写的脚本，一个没有分割Action的脚本，默认会生成Action0和Action1两个Action，其中Action0中一般只有一句话：

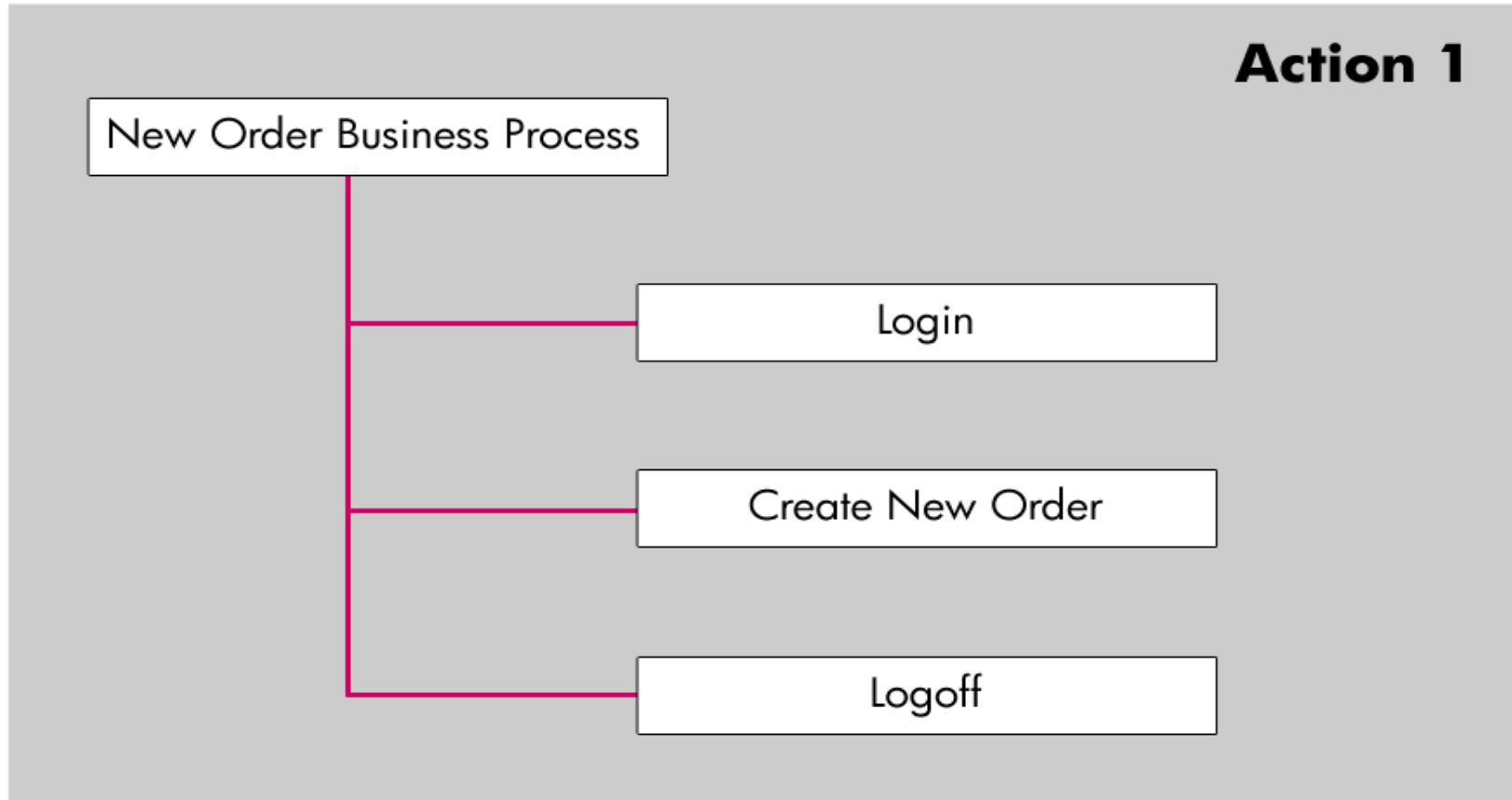
**RunAction Action1, oneliteration**

当运行脚本时，实际上，只是运行了Action0，其他的Action都是被Action0调用的。copy过来的Action，如果没有使用RunAction的方法来调用，应该是不会被运行的，因为没有被Action0直接或间接调用。



# 测试实现—实现testCase Action

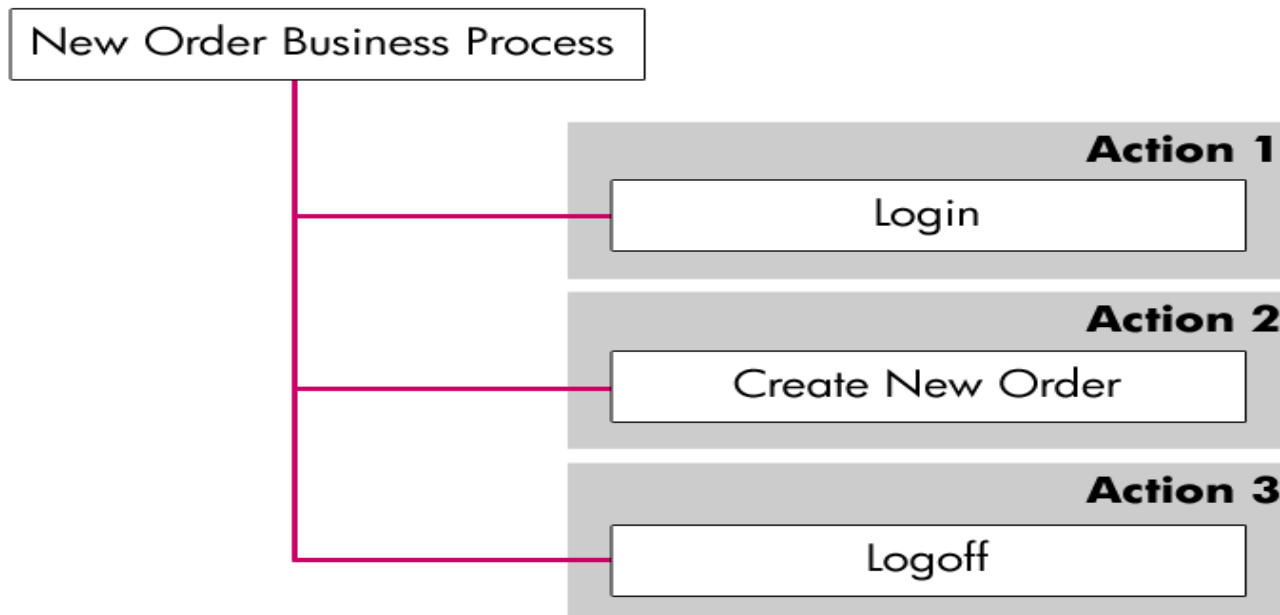
## Single Action Test



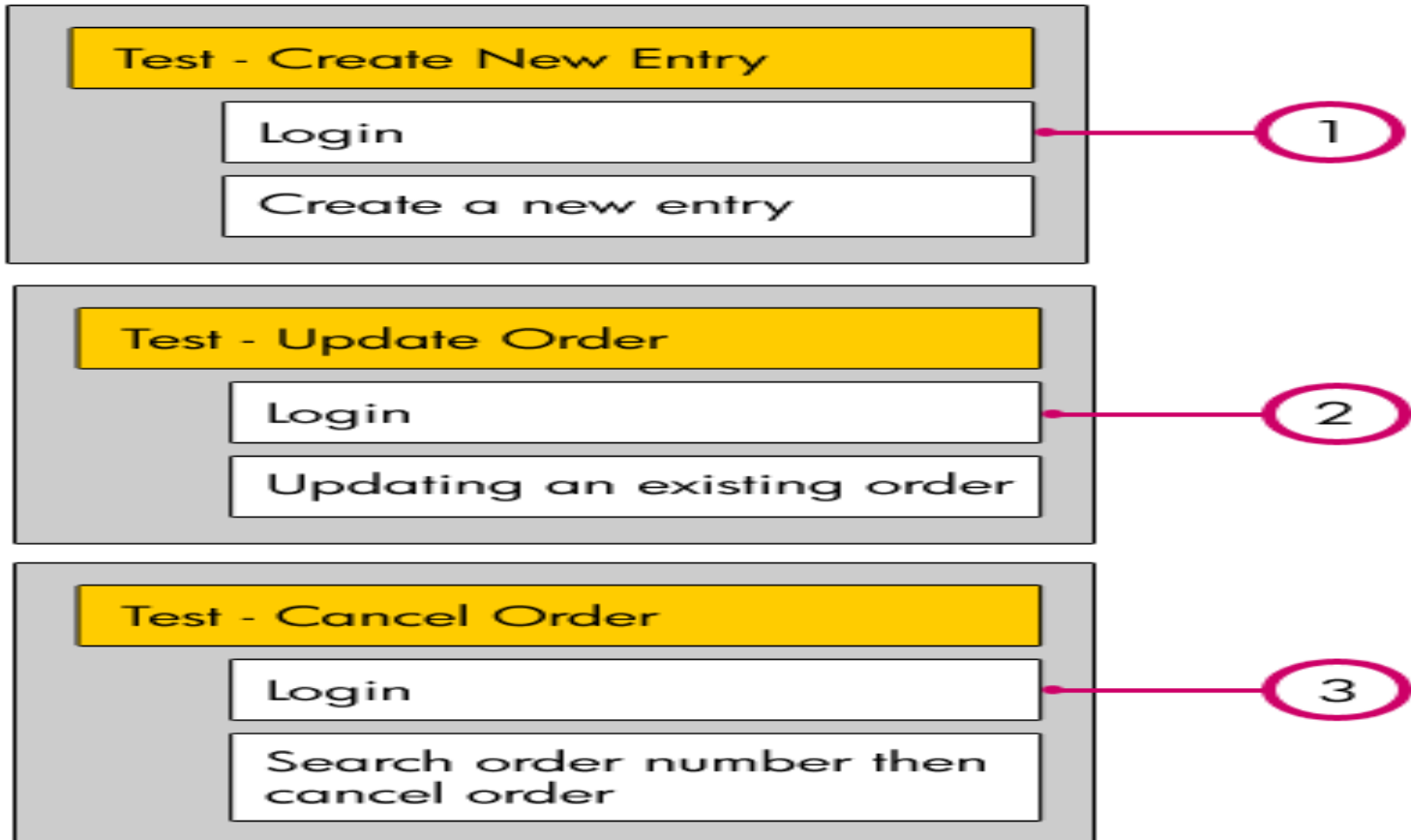
# Creating Reusable Action

## A Test with Multiple Actions

### Multiple Action Test



## One Action Used Many Times

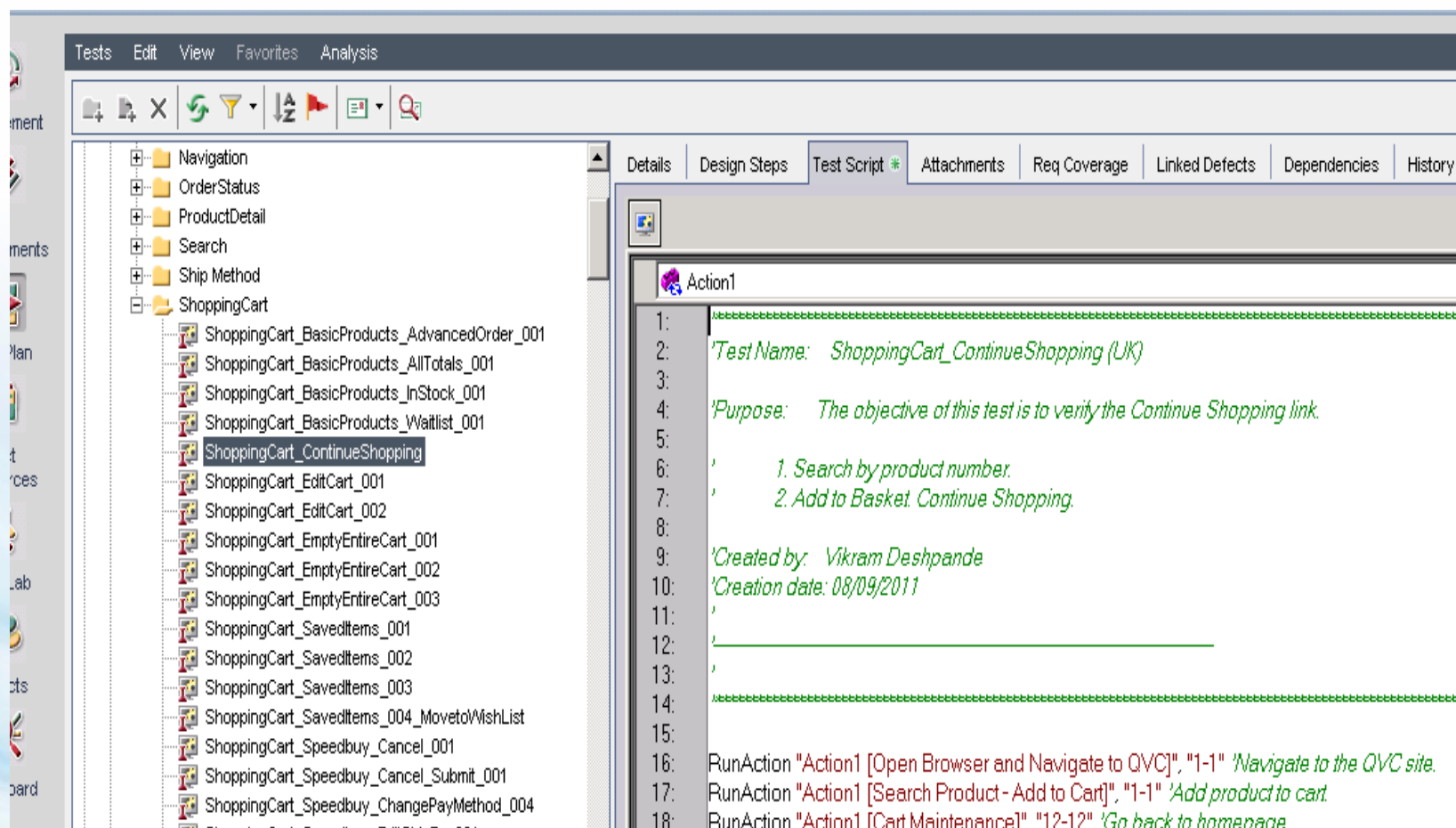


## Test Flow List

The screenshot displays a software interface for creating reusable actions. On the left, the 'Solution Explorer' pane shows a project named 'Solution Untitled' containing a folder 'CheckOut\_Basic\_001'. Inside this folder, there is an 'Action1' folder, which contains a 'Local' folder and an 'External Actions' folder. The 'External Actions' folder lists 14 actions, each preceded by a red icon and a plus sign. These actions are: Action1 [Cart Maintenance], Action1 [Login Account], Action1 [Open Browser and Navigate to FP], Action1 [Order Complete], Action1 [Pay with PayPal Account], Action1 [Product Detail], Action1 [Product Filter], Action1 [Search Product], Action1 [Select Pay Method], Action1 [Shipping Method], Action1 [ShipToAddress], Action1 [Sign Out and Close Browser], and Action1 [Your Receipt]. Below the 'External Actions' folder is a 'Function Libraries' folder. The main area of the interface shows a detailed view of the 'Action1' folder. It includes a toolbar with icons for zooming, a search bar, and a 'Show parameters:' dropdown set to 'Links only'. The central pane displays a vertical sequence of 14 actions, each in a blue box with a red icon and a plus sign. The actions are: Action1 [Open Browser and Navigate to FP], Action1 [Search Product], Action1 [Product Filter], Action1 [Product Detail], Action1 [Cart Maintenance], Action1 [Login Account], Action1 [ShipToAddress], Action1 [Shipping Method], Action1 [Select Pay Method], and Action1 [Pay with PayPal Account]. The bottom of the interface features a 'Solution Explorer' tab, a 'Toolbox' tab, and a 'Data' tab.

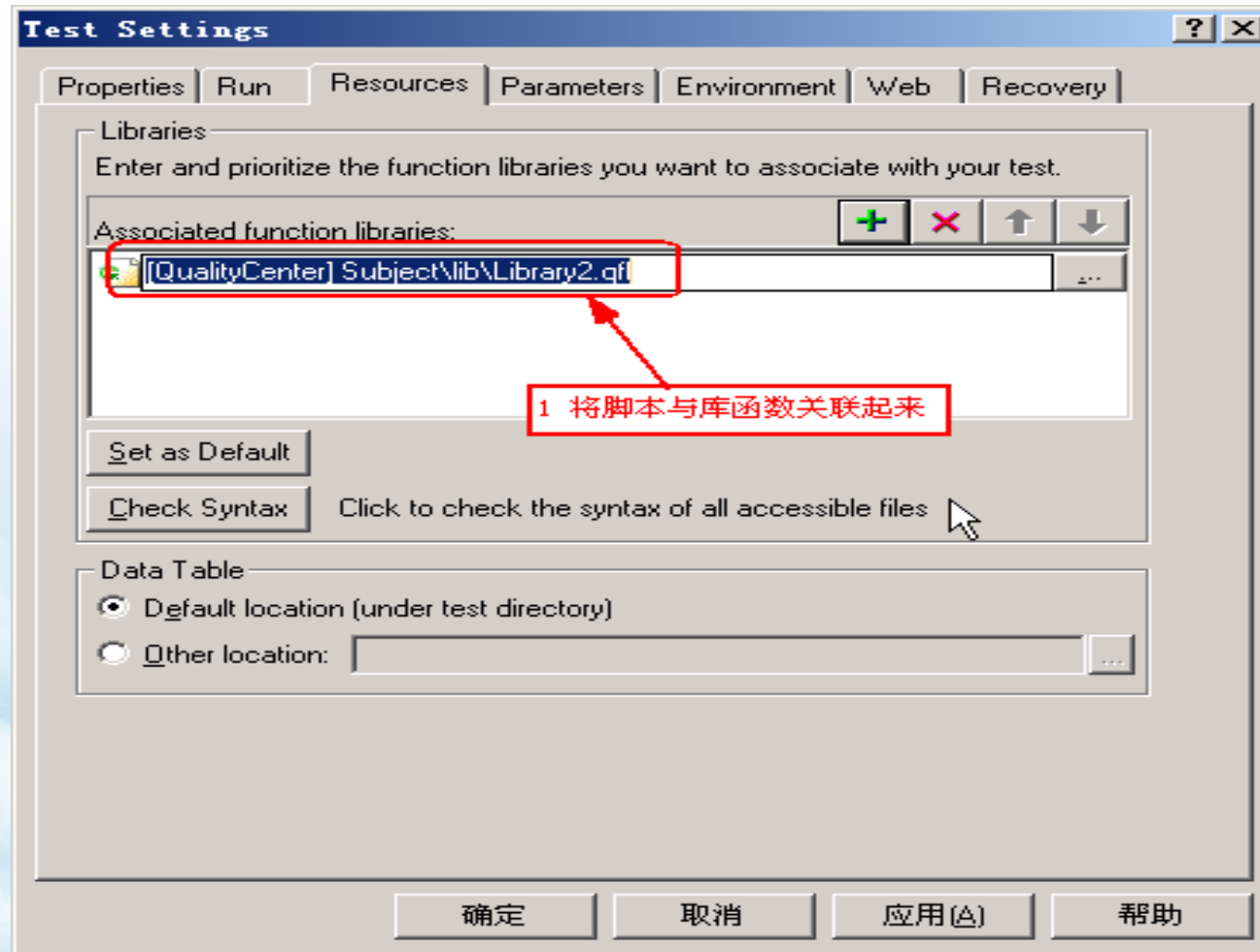
# 测试实现—实现testCase Action

另存到QC服务器上



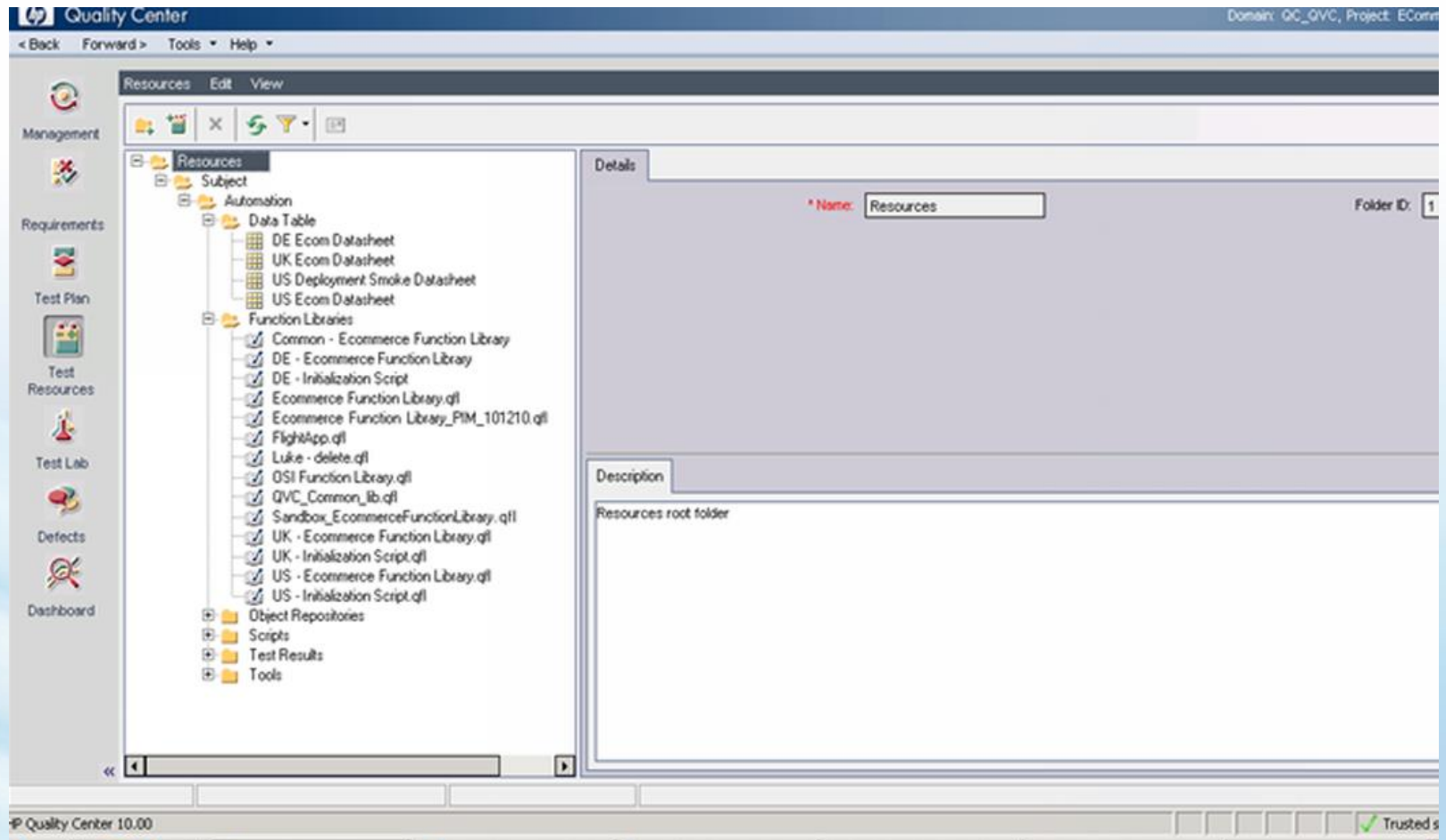
# 测试实现—实现testCase

点击 **File – Setting**，打开设置页面，将脚本与库函数关联起来



# 测试实现—Data 和 Functions

## 自动化测试框架中的Data和Functions部分





# 测试实现—Data

## 测试数据准备

Resources Edit View

Resources Subject Automation Data Table DE Ecom Datasheet UK Ecom Datasheet US Deployment Smoke US Ecom Datasheet Function Libraries Object Repositories Scripts Test Results Tools

Details Resource Viewer Dependencies History

Upload File... Download...

File name: UK Ecom Datasheet.xls

QA: Sheet

	TestName	_special_note	CustomerNum	PIN	Email	ProductNum	ProductDesc	ProductColor	ProductSize	Pro
1	CheckOut_Basic...	valid account wit...	50326740	2712		589523				
2	CheckOut_Emplo...	Employee, valid r...	16846931	2639		589523				
3	CheckOut_ShipT...	valid account wit...	50326740	2712		831326		LATTE	BCB	
4	CheckOut_Signl...	new account, val...				589523				
5	CheckOut_Spee...	valid account wit...	50326740	2712		589523				
6	MbrMaint_Addr_...	valid account	50326740	2712						
7	MbrMaint_CC_00...	valid account	50326740	2712						
8	MbrMaint_WL_0...	valid account, va...	50326740	2712		589523				
9	CheckOut_Basic...	valid account, va...	50326740	2712		589523				
10	CheckOut_Basic...	valid account, va...	50326740	2712		589523				
11	CheckOut_Basic...	valid account, va...	50326740	2712		589523				
12	CheckOut_Basic...	valid account, 2 ...	55967744	2064		589523				2295

[Quality Center\Resource] Resources\Subject\Automation\Data Table\UK Ecom Datasheet QA: Sheet X

2015/7/31 11:12:20 AM

# 测试实现-重用Model

测试实现，需要实现两部分的内容

- 1: 测试用例的实现（TestCase Action的实现）
- 2: 基础业务功能的实现（Reusable Action的实现）

其中，testCase Action只调用reusable Action，每个业务功能如何实现，都放在了resuable Action中。

# 目录

1. 测试设计

2. 测试实现

3. 测试执行

# 测试执行-在QC中运行测试套件

登陆QC，进入Test Lab，新增一个测试套件(test suit)

The screenshot displays the Quality Center (QC) Test Lab interface. The left sidebar shows the 'Management' tree with 'Test Automation' expanded, listing various regression test sets. The main area shows the 'Execution Grid' for a test plan named 'Test Name'. The grid lists test cases with their status (Failed or Passed) and the responsible tester (00915314). Below the grid, the 'Last Run Result' section shows a table of execution steps and their details.

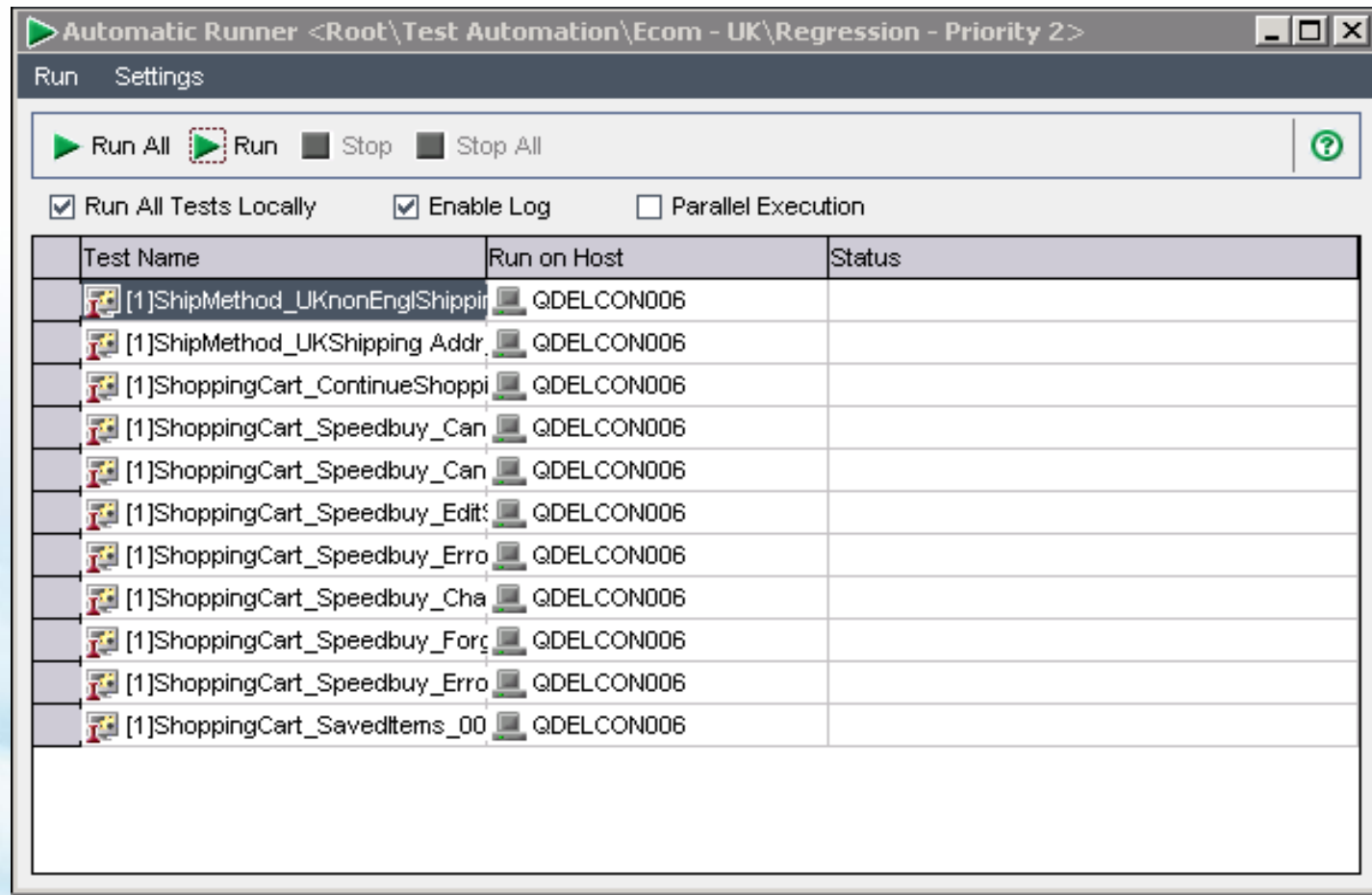
Plan: Test Name	Status	Plan: Change Status	Change Date	Responsible Tester
[1]ShipMethod_UKnonEnglShipping Addr_DedSM50	Failed			00915314
[1]ShipMethod_UKShipping Addr_DedSM50	Passed			00915314
[1]ShoppingCart_ContinueShopping	Passed			00915314
[1]ShoppingCart_Speedbuy_Cancel_001	Passed			00915314
[1]ShoppingCart_Speedbuy_Cancel_Submit_001	Passed			00915314
[1]ShoppingCart_Speedbuy_EditShipTo_001	Passed			00915314
[1]ShoppingCart_Speedbuy_Error_001	Passed			00915314
[1]ShoppingCart_Speedbuy_ChangePayMethod_004	Passed			00915314
[1]ShoppingCart_Speedbuy_ForgotPIN_001	Passed			00915314
[1]ShoppingCart_Speedbuy_Error_002	Passed	Not Changed		00915314
[1]ShoppingCart_SavedItems_001	Passed	Not Changed		00915314

Step Name	Status	Exec Date	Exec Time	Condition	Steps Details
Start Test		1/12/2012	9:03:03 PM		<b>Description:</b> Start Test ShipMethod_UKnonEnglShipping Addr_DedSM50
Output to global sheinfo		1/12/2012	9:03:05 PM		<b>Expected:</b>
Output to global sheinfo		1/12/2012	9:03:05 PM		

Server Time: 1/13/2012 3:41

# 测试执行-在QC中运行测试套件



# 测试跟踪

ShipMethod\_UKShipping Addr\_DedSM50 [Run\_1-12\_21-1-39] - Test Results

File View Tools Help

Test ShipMethod\_UKShipping Addr\_DedSM50 Summary

- Run-Time Data Table
- Output to global sheet
- Output to global sheet
- Output to global sheet
- This test is run in the uk-qa environment by 00915314
- ShipMethod\_UKShipping Addr\_DedSM50 Iteration 1 (Row 1)
  - Action1 Summary
    - Action1 [Open Browser and Navigate to QVC] Summary
    - Action1 [Search Product - Add to Cart] Summary
    - Action1 [Cart Maintenance] Summary
    - Action1 [Login Account] Summary
    - Action1 [ShipToAddress] Summary
    - Action1 [Delivery Method] Summary
    - Action1 [Delivery Method] Summary
    - Action1 [Select Pay Method] Summary
    - Action1 [Submit Order] Summary
    - Action1 [Order Confirmation - Thank You] Summary
    - Action1 [Order Confirmation - Thank You] Summary
    - Action1 [Sign Out and Close Browser] Summary

## ShipMethod\_UKShipping Addr\_DedSM50 Results Summary

**Test:** ShipMethod\_UKShipping Addr\_DedSM50  
**Results name:** Run\_1-12\_21-1-39  
**Time Zone:** Eastern Standard Time  
**Server name:** http://vpwf1093:8080/qcbin  
**Project name:** QC\_QVC.ECommerce  
**Run started:** 1/12/2012 - 21:07:05  
**Run ended:** 1/12/2012 - 21:08:44  
**Test set:** Root\Test Automation\Ecom - UK\Regression - Priority 2  
**Test instance:** 1

Iteration #	Results
1	Passed

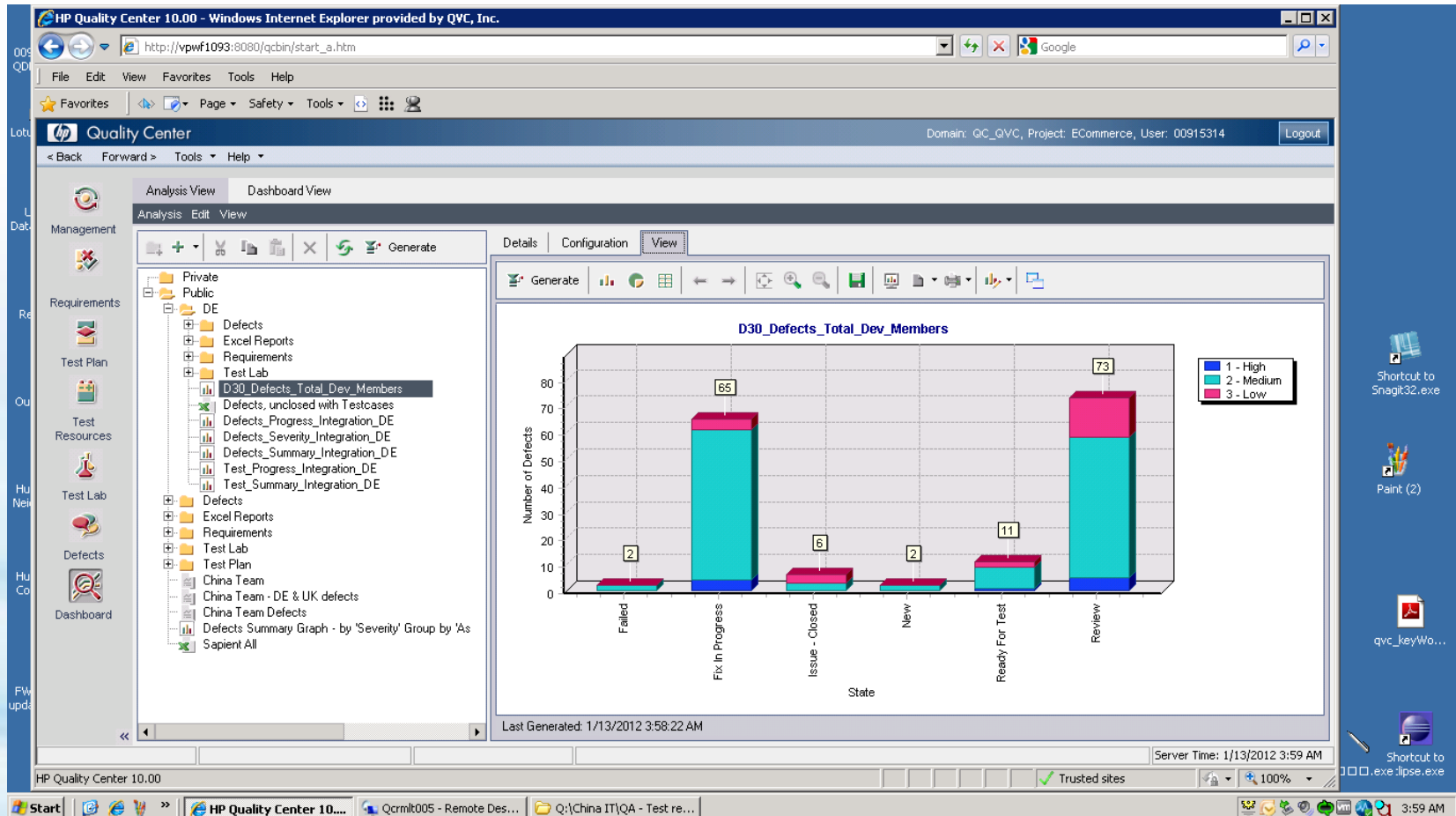
Status	Times
Passed	25
Failed	0
Warnings	0

Result Details Screen Recorder System Monitor

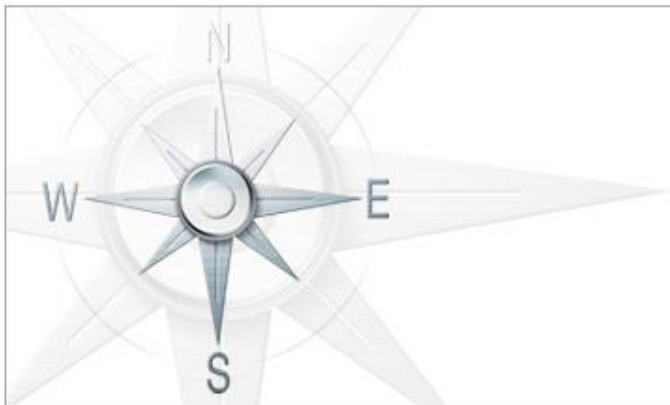
For Help, press F1

Ready Quality Center Server: http://vpwf1093:8080/qcbin Quality Center Project: ECommerce

# 缺陷统计







## 备注

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