

Keyword Driven Framework In Qtp With Complete Source Code

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The world of automated software testing is constantly evolving, and one technique that significantly improves efficiency and maintainability is the keyword-driven framework. This article dives deep into creating a keyword-driven framework in QuickTest Professional (QTP), now known as UFT (Unified Functional Testing), providing you with a complete source code example and a comprehensive understanding of its implementation. We'll explore the benefits, practical usage, and potential challenges, equipping you with the knowledge to build and leverage this powerful testing approach. This framework allows for efficient test automation by separating test scripts from test data, a concept we'll explore in detail, covering topics like **data-driven testing**, **excel integration**, and **function libraries**.

Introduction to Keyword-Driven Frameworks in UFT

A keyword-driven framework in UFT streamlines the testing process by employing keywords to represent specific actions within your application under test (AUT). Instead of writing complex VBScript code for each test case, you define a set of keywords that correspond to these actions (e.g., "Login," "Click Button," "Verify Text"). Test cases are then created by simply sequencing these keywords along with the necessary data. This approach promotes reusability, simplifies maintenance, and allows business users with limited coding experience to participate in test case design. This makes it a crucial element of successful **test automation strategies**.

Benefits of a Keyword Driven Framework in UFT

Using a keyword-driven approach offers several significant advantages:

- **Increased Reusability:** Keywords encapsulate actions, making them reusable across multiple test cases. This drastically reduces code duplication and development time.
- **Improved Maintainability:** Changes to the AUT require minimal modifications to the test cases. You primarily update the keyword definitions rather than rewriting extensive scripts.
- **Enhanced Collaboration:** The keyword-based approach allows business analysts and testers to easily collaborate on test case design, as they don't need advanced programming skills.
- **Reduced Test Script Complexity:** Test scripts become simpler and more readable, leading to easier debugging and troubleshooting.
- **Better Data Management:** Separating test data from the scripts allows for efficient management and manipulation of test input values. We'll see how this works with **excel data-driven testing** below.

Implementing a Keyword-Driven Framework in UFT: A Complete Example

Let's build a simple keyword-driven framework in UFT. We'll use an Excel spreadsheet to store our test data and keywords, and a function library to handle the actual actions.

1. Excel Sheet (TestData.xls):

Keyword	Object	Value
OpenBrowser	Browser	"www.google.com"
TypeText	SearchBox	"Keyword Driven Framework"
ClickButton	SearchButton	

| VerifyText | ResultPage | "Keyword Driven Framework" |

| CloseBrowser | Browser | |

2. UFT Function Library (KeywordLibrary.vbs):

```
`` `vbscript
```

```
Function OpenBrowser(browserName, url)
```

```
Set browser = Browser("name:=" & browserName).Create()
```

```
browser.Navigate url
```

```
End Function
```

```
Function TypeText(objectName, text)
```

```
Set obj = Description.Create()
```

```
obj("name").Value = objectName
```

```
Set obj = Window("title:=.*").ChildObjects(obj)
```

```
obj.SetFocus
```

```
obj.Type text
```

```
End Function
```

```
Function ClickButton(objectName)
```

```
Set obj = Description.Create()
```

```
obj("name").Value = objectName  
Set obj = Window("title=.*").ChildObjects(obj)  
obj.Click  
End Function  
  
Function VerifyText(objectName, expectedText)  
Set obj = Description.Create()  
obj("name").Value = objectName  
Set obj = Window("title=.*").ChildObjects(obj)  
If InStr(obj.GetROProperty("text"), expectedText) > 0 Then  
Reporter.ReportEvent micPass, "Verification Passed", "Text '" & expectedText & "' found."  
Else  
Reporter.ReportEvent micFail, "Verification Failed", "Text '" & expectedText & "' not found."  
End If  
End Function  
  
Function CloseBrowser(browserName)  
Set browser = Browser("name=" & browserName).Object  
browser.Close
```

End Function

...

3. UFT Test Script (TestScript.mts):

```
`` `vbscript
```

```
'Set the path to your Excel file.
```

```
Set objExcel = CreateObject("Excel.Application")
```

```
Set objWorkbook = objExcel.Workbooks.Open("C:\TestData.xls")
```

```
Set objSheet = objWorkbook.Worksheets(1)
```

```
'Loop through each row in the Excel sheet
```

```
For i = 2 To objSheet.UsedRange.Rows.Count
```

```
keyword = objSheet.Cells(i, 1).Value
```

```
object = objSheet.Cells(i, 2).Value
```

```
value = objSheet.Cells(i, 3).Value
```

```
'Call the appropriate function based on the keyword
```

```
Select Case keyword
```

```
Case "OpenBrowser"
```

```
Call OpenBrowser(object, value)
```

```
Case "TypeText"  
Call TypeText(object, value)  
Case "ClickButton"  
Call ClickButton(object)  
Case "VerifyText"  
Call VerifyText(object, value)  
Case "CloseBrowser"  
Call CloseBrowser(object)  
End Select  
Next  
objWorkbook.Close  
objExcel.Quit  
````
```

This example demonstrates a basic implementation. In a real-world scenario, you'd have a more extensive function library and a robust mechanism for error handling and reporting. This example also showcases **excel integration** and its role in a keyword driven framework.

## Usage and Implementation Strategies

Successful implementation of a keyword-driven framework requires careful planning and execution. Key steps include:

- **Keyword Identification:** Define a comprehensive set of keywords that covers all the required actions in your AUT.
- **Function Library Development:** Create well-structured and reusable functions for each keyword.
- **Data Management:** Establish a clear system for organizing and managing test data, often using Excel or a database. This will be a core part of your **data-driven testing** strategy.
- **Test Case Design:** Create test cases by simply sequencing keywords and input data.
- **Execution and Reporting:** Implement a mechanism for executing test cases and generating comprehensive reports.

## Conclusion

The keyword-driven framework in UFT offers a highly efficient and maintainable approach to automated software testing. By separating test logic from test data and using reusable keywords, this framework significantly reduces development time, enhances collaboration, and improves overall test quality. While the initial setup requires careful planning, the long-term benefits far outweigh the initial investment. Remember to focus on choosing meaningful keywords and building a well-structured function library to truly reap the rewards of this powerful testing methodology.

## FAQ

### Q1: What are the limitations of a keyword-driven framework?

A1: While highly beneficial, keyword-driven frameworks have limitations. For very complex scenarios with intricate logic, they can become less efficient than a data-driven or hybrid approach. Furthermore, extensive keyword creation and maintenance can be challenging for large-scale projects. Proper planning and a modular design are key to mitigating these challenges.

### Q2: How does a keyword-driven framework differ from a data-driven framework?

A2: A keyword-driven framework focuses on actions (keywords) that are executed based on data provided (often from an external source like Excel), while a data-driven framework primarily focuses on iterating through test data to execute the same set of actions repeatedly. They are not mutually exclusive and can be combined effectively in a hybrid approach, further enhancing testing efficiency.

**Q3: Can I use a database instead of Excel for test data?**

A3: Absolutely! Using a database like SQL Server or MySQL offers several advantages, particularly for larger projects with extensive test data. You'd need to adjust your script to interact with the database instead of Excel, but this provides more robust data management capabilities.

**Q4: How do I handle errors and exceptions in a keyword-driven framework?**

A4: Robust error handling is crucial. Your functions should include try-catch blocks to gracefully handle exceptions. You should also implement detailed logging and reporting mechanisms to record error details and aid in debugging. The UFT reporting features are excellent for this purpose.

**Q5: What are some best practices for designing keywords?**

A5: Use clear, concise, and descriptive names. Keep keywords self-contained and avoid dependencies on other keywords wherever possible. Aim for modularity – break down complex actions into smaller, more manageable keywords. Follow consistent naming conventions throughout your framework.

**Q6: How can I integrate this with continuous integration/continuous deployment (CI/CD) pipelines?**

A6: You can integrate your keyword-driven framework with CI/CD pipelines by automating the execution of your test scripts using tools like Jenkins or Azure DevOps. The results can then be integrated into your CI/CD pipeline to trigger appropriate actions based on test success or failure.

**Q7: What is the role of object repository in this framework?**

A7: While not explicitly shown in the simplified example, a well-maintained object repository remains essential. The object repository stores information about the objects in your application under test. This allows for improved maintainability and

reduces the risk of test script breakage when UI elements change slightly. You should reference objects from the repository within your keyword functions.

**Q8: Is this approach suitable for all types of testing?**

A8: Keyword-driven frameworks are particularly well-suited for functional testing and regression testing. They can be adapted for other types of testing, but the effectiveness may vary depending on the specific testing approach and the complexity of the application. They are less often directly used for performance or security testing, for example, though the underlying principles of modularity and reusability can still be applied.

## **Keyword Driven Framework in QTP with Complete Source Code: A Comprehensive Guide**

Automating verification procedures is critical in today's fast-paced software creation landscape. Hand testing is inefficient and susceptible to mistakes, while automation presents significant advantages in terms of speed, precision, and re-application. One robust approach to software test automation is the Keyword Driven Framework (KDF), and this article will delve into its execution using QuickTest Professional (QTP), now known as UFT (Unified Functional Testing), providing a complete source code example.

The Keyword Driven Framework in QTP structures test cases around keywords, which represent specific actions or procedures within the application in question. These keywords are held in a centralized repository, usually an Excel spreadsheet or a database, alongside related data, such as parameters and anticipated outcomes. The framework then retrieves these keywords and data, executing the corresponding QTP scripts to robotize the validation procedure.

This approach offers several key benefits:

- **Increased Reusability:** Keywords can be reused across multiple test cases, minimizing redundancy and upkeep.
- **Improved Maintainability:** Modifications to the test scripts are isolated, making it simpler to update and preserve the framework.
- **Enhanced Collaboration:** The separation of test creation from test scripting enables for better collaboration between testers and developers.

- **Easier Understanding:** The keyword-driven technique makes it less difficult for non-programmers to comprehend and change test cases.

Let's explore a tangible example. Imagine validating a login capability. The keywords might include: "OpenBrowser", "TypeText", "ClickButton", "VerifyText". The data sheet would contain information such as the location of the website , the user ID, the secret , and the expected confirmation .

The QTP script would then read this data, execute the appropriate keywords, and verify the actual results against the target outputs.

### **Complete Source Code Example (Illustrative):**

This example uses VBScript within QTP. Remember that this is a simplified illustration and a full-fledged framework requires more elaborate error handling, logging, and reporting mechanisms.

```
````vbscript

' Read data from Excel sheet (replace "testData.xls" with your file)

Set objExcel = CreateObject("Excel.Application")

Set objWorkbook = objExcel.Workbooks.Open("testData.xls")

Set objWorksheet = objWorkbook.Worksheets(1)

' Loop through each test case

For i = 2 To objWorksheet.UsedRange.Rows.Count

keyword = objWorksheet.Cells(i, 1).Value

value1 = objWorksheet.Cells(i, 2).Value
```

```
value2 = objWorksheet.Cells(i, 3).Value

Select Case keyword

Case "OpenBrowser"

Browser("title=.*").Page("title=.*").WebEdit("name=username").Set value1

Case "TypeText"

Browser("title=.*").Page("title=.*").WebEdit("name=password").Set value2

Case "ClickButton"

Browser("title=.*").Page("title=.*").WebButton("text=Login").Click

Case "VerifyText"

' Add your verification logic here

End Select

Next

objWorkbook.Close

objExcel.Quit

Set objWorksheet = Nothing

Set objWorkbook = Nothing

Set objExcel = Nothing
```

...

This code snippet demonstrates the fundamental idea of reading keywords and data from an Excel sheet and then using them to drive the QTP script's execution. A strong framework would require more advanced error handling, logging, and reporting capabilities, but this example provides a foundation for creating a complete Keyword Driven Framework in QTP. Remember to install the necessary components and adapt the code to suit your unique system and validation requirements .

Conclusion:

The Keyword Driven Framework in QTP provides a structured and manageable technique to automate software validation . By separating test design from scripting , it boosts collaboration , re-application, and sustainability. While this article provides a simplified example, implementing a full-fledged KDF requires careful planning, design, and attention to detail. The rewards, however, are substantial in terms of productivity and quality of the verification cycle.

Frequently Asked Questions (FAQs):

1. Q: What are the drawbacks of a Keyword Driven Framework?

A: While KDFs offer many benefits, they can become intricate to control for sizable endeavors. Careful planning and creation are essential to avert unnecessary intricacy .

2. Q: Can I use other stores besides Excel?

A: Absolutely . Databases such as SQL Server are frequently used as alternative data sources for a Keyword Driven Framework.

3. Q: What code languages can I use with QTP?

A: QTP (UFT) primarily uses VBScript, but it also supports other languages through add-ins .

4. Q: How do I handle mistakes in my Keyword Driven Framework?

A: Robust error handling is essential . Implement error-handling blocks in your QTP scripts to gracefully deal with errors and record them appropriately. This enables problem-solving and locating the root cause of errors.

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