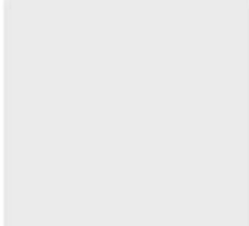
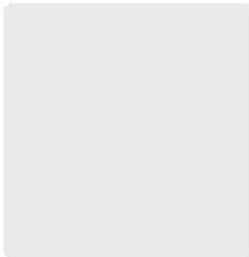




Larsen & Toubro Infotech Ltd.

Building relationships globally



LT-FAST Test Automation Framework

By

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Abstract

LT-FAST is Larsen & Toubro Infotech's Functional Test Automation framework created using Keyword Driven approach. The framework is Automation tool agnostic. The Framework can be used for testing systems independent of the platform. As of now LT-FAST has been used for Web based, Client Server (Microsoft) and Mainframe systems and implemented on Automation tools like WinRunner and Quick Test Professional.

The LT-FAST framework can be used for functional testing of Web based, Client Server or Mainframe systems. It has a rich library of 56 keywords that cover almost all common actions performed on most commonly used standard components. The framework has a facility to build custom reports for test execution; provided the Automation tool supports database connectivity. The framework is easy to use with a minimal training.. Framework use requires a one time activity of setup and configuration.

The document describes the need of framework, its structure and its benefits.

About Larsen & Toubro Infotech

Larsen & Toubro Infotech (L&T Infotech) is a fast growing IT services and consulting company with mature offshore capability. L&T Infotech has a rapidly growing team of over 7200 consultants.. L&T Infotech has achieved some of the highest global industry accreditations including **SEI CMM Level 5**, **ISO 9001:2000**, **PCMM Level 5** and **BS 7799** that allow us to ensure processes which deliver consistent, repeatable on-time and on-budget results, with the highest standards in information security.



We take pride in our IT services and relationship excellence attained by servicing several 'demanding' Fortune 100 companies with dedicated off-shore development centers in India.

L&T Infotech is a 100% unlisted subsidiary of Larsen & Toubro Limited (L&T), a **USD 4.5 Billion** technology focused conglomerate and a **Forbes 2000 company**.

Need of Framework

Test Automation is adopted in many projects with the objective of reduction in testing cycle times, reduction in efforts and resources and in turn attaining more focus on testing the critical and complex areas of application that need to be tested manually. Although Test Automation implemented without any framework tries to address the above points it introduces its own set of problems. Some of these are illustrated below:

- "It worked when I recorded it!"
This is a common problem across most of the Test Automation projects where the "Capture and Replay" method is used for automation. Scripts work perfectly when they are created while recording the test cases and stop working after a while with the same objects or after a few minor modifications to the application
- Skills required by the testers to use the tool
Since the scripts have to be changed frequently with the changes in the application, the testers necessarily have to know the scripting language and a level competency is required to support such changes
- Reusability
Without frameworks it becomes difficult to apply any automation methodologies like keywords or functional decomposition. This reduces the chances of having any reusable scripts and leads to bulky scripts making it difficult to manage. This increases the script maintainability
- Standardization
Automation engineers working on different automation projects tend to have their own set of the design, structuring, coding standards of scripts.

The Framework

Framework Elements

The LT-FAST framework suggests use of simple tools like Excel, Access/SQL for its implementation. The framework consists of following:

IES – Initialization and Environment settings: This file can be a flat file supported by the Test Automation Tool (TAT) containing information required regarding the application environment. It is suggested to also hold the details of framework elements like test cases, test case database, and report database.

KDT – Keyword Driven Test case: This can be a file supported by the TAT to contain the sequence of Keywords for each test case to be executed by the TAT.

Test Data – The Test case data can be stored external or internal to the TAT or in both as suited best for the Test case. The LT-FAST supports Test case data in KDT or being fetched from an external source like flat files or databases as supported by the TAT.

Function Library – The Function library consists of library of routines for execution of Keywords as well as library for some common routines. It also has routines written for recording the test execution results apart from what TAT can provide. The Function libraries can be extended to include any application specific routines/Keywords. The enhancements and additional Keywords are approved by LT-FAST committee.

Keyword Processor – This script reads the KDT and executes the Keywords using the routines in function library. The Data Parameter provides the facility to fetch data either from the external data source or from within the KDT.

Main Script – The Main Script would interact with IES, KDT, Keyword Processor, Reports and is the main controller of the Test case execution. It also provides a User interface to select Test cases to be executed.

Reports – As the framework supports tracking custom test execution by capturing the test execution results into a Test Results tracking database numerous custom reports can be built using reporting tools.

Framework Functioning

The Figure 1 below shows the LT-FAST framework Block Diagram. The functioning of the framework is described below. The document describes the functioning of the **standard** LT-FAST framework.

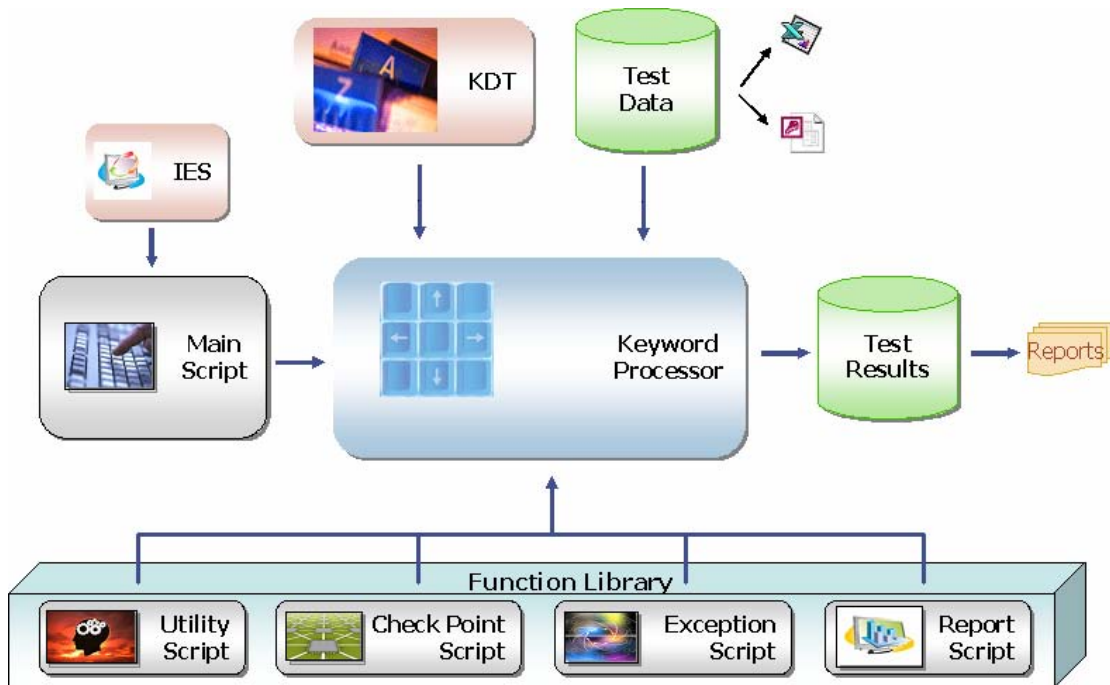


Figure 1

The Main Script is the first script to be run by the user. The Main Script performs the function of reading the IES file. The IES file would contain the User Input in terms of which Test cases are to be executed on which application/environment. Alternatively if the TAT allows user dialogs then the user can enter the necessary information using these dialogs. This lets the Main Script set the necessary application environment as per user choice and also set paths to the Test cases, Test Data, Reports. After all the initialization the Main Script reads the KDT and sequences all the Keywords to be executed. The control is then passed on to the Keyword Processor that interacts with the Function Library to execute the Keywords and also tracks the Test case execution. The Test case data is fetched from the Test Case Database or the KDT or any external source as specified. On error or completion the control goes back to the Main Script and the routine of reporting tracks the Test case execution result to the Test Results Reporting database. The next Test case can now be executed with the same routine of reading the Keywords and executing them. This will continue till the last Test case gets executed.

Benefits of the Framework

Some key benefits of using this framework are listed below:

- Moderate technical competency required for the use – The framework in itself is very easy to use and does not require special automation skills unless there is a need for modifications or enhancements
- Reusability– The framework with its existing set of scripts and keywords can be used for automating any set of applications
- Ease of Use - The only task involved in test automation is to –
 - 1) Learn the objects of the application in the tool
 - 2) Write the set of keywords in a spreadsheet just the way one writes test steps in manual test cases
 - 3) Create the required test data
- Low maintenance cost – The only cost involved is when there is any change in the framework or requires a new Keyword
- Rapid Automation Suite Development – The framework is ready to use and has minimal efforts required in terms of setting up the automation bed. Thus one can quickly come up with an automation solution for any application that has been identified for automation
- Custom Reporting – Apart from the report generated by the test automation tool the framework supports custom reporting based on the parameters defined during the requirements stage of automation. This helps the QA analysts to quickly know the behavior of the application after an execution which is easy to read and understand from the application perspective
- Tool independent – The framework can be used with various Test Automation tools, giving the freedom to the organization to choose any tool
- Customization - The framework can be customized for application specific needs
- How does this tool help in standardization – we have mentioned this as a need for the framework

Glossary

Some of the short terms used in this document are mentioned below.

Sr.No	Term	Full Form
1	LT-FAST	L&T Infotech's Framework for Automated Software Testing
2	TAT	Test Automation Tool
3	IES	Initialization and Environment Settings
4	KDT	Keyword Driven Test case

Author Biography

Deepesh Belani is currently working as the offshore Test Lead for a Software Testing project for an Insurance Intermediary. The project involves manual as well as Automated Software Testing. Deepesh has got overall experience of 4 years in Software Testing. In these 4 years he has worked as an efficient manual tester as well as automation engineer. He has also worked on developing key word driven frameworks, which are automation tool independent. Currently Deepesh owns maintenance and enhancements of the key word driven frameworks at L & T Infotech. He is a member of the Test Automation framework committee in L&T Infotech. He has done his graduation (B.E.) in Computer Technology.

Gaurav Oberoi is currently working as Automation Engineer for a Software Testing project of an Insurance Intermediary. Gaurav has got overall experience of more than 3 years in Software Testing. In these years he has worked extensively on manual as well as automation testing projects. He has also worked on developing key word driven frameworks, which are automation tool independent. Gaurav has thorough knowledge of Test Automation frameworks developed by L & T Infotech and he has implemented the test automation framework for functional testing in a number of projects. He has done his graduation (B.E.) in Instrumentation Technology.

Dharmit Shah is currently working as Automation Engineer for a Software Testing project of an Insurance Intermediary. Dharmit has got more than 2 years of experience in Software Testing Arena. In these 2 years, he has worked on manual as well as Automation Testing of web-based applications. Currently Dharmit is working on Automation of XML comparison testing using LT-FAST framework. He has given major contributions in developing Key Word driven Test Automation Framework. He has done his graduation (B.E.) in Computer Technology.