# A Framework for Designing the Test Script Automatically

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***Abstract*: Test cases for software testing can be created manually or automatically. We are providing a methodology for creating test data automatically in this study. We put a lot of effort into automating the software testing process so that test cases may output more complicated code with less effort utilising some clever approaches, such natural language processing.**

***Keywords*: Software testing, Natural language Processing (NLP), automated test case. Generating test script**

## 1. INTRODUCTION

Software testing is a task to make sure software systems are of high quality. It is a crucial but pricey step in the lifecycle of software development. Prior to giving the product to the customer, it is used to improve its quality.

"However, software testing is costly. Statistics say that 50% of the total cost of software development is devoted to software testing even if it is more in the case of critical software" [1]. "Automation Software Testing involves different activities like selection of test tools, defining the scope of automation, planning, design, development, execution, and maintenance, etc. Good quality software can be made by using an efficient test method. The problem is how to reduce the software testing work while ensuring good quality software. Some solutions involve software execution automation tools, outsourcing the testing tasks at lower labor rates. Such solutions still depend upon individual skills in the generation of the test cases." [2]

Test execution in automated software testing tools entails manually conducting tests on a computer system. Such methods continue to rely on the tester's programming abilities to create the test script. Instead of manually writing test scripts, we concentrated on the automatic generation of test scripts in this paper.

## 2. MOTIVATION

"Software engineering research puts a large emphasis on automating the software development process that produces large and complex quantities of code with less effort [1]. For software testing, we need to find advanced intelligent support procedures to automate the testing process" [3]. In spite of continuous effort till today automated testing has limited impact in the industry, where the test generation activity remains largely done manually. Automation testing requires expertise in multiple languages and technologies, also it requires manual intervention to create test script, to execute, monitor and maintain automated tests. "What we need is 100% automated testing to reduce the overall cost of software development with high quality" [1]. Most of the times, design and maintenance takes the majority of the time allocated for automation of test scenarios and there is an extra cost for maintenance of the test automation team and training on specific tools being implemented.

Test-case design is one of the stages in automation testing when the human tester creates a set of test cases using written (formal) requirements that are frequently stated in natural language (NL). Numerous strategies have been put out in various literatures to lessen the manual labour involved in converting natural-language requirements into automated test cases utilising NLP, UML, or code.
NLP is The field of computer science and artificial intelligence known as natural language processing (NLP) is concerned with how computers interact with human (natural) languages, particularly how to teach computers to process and evaluate natural language data. The primary goal of using NLP is to create automated test scenarios from test cases. "A number of test data generation techniques such as random test data generator, path oriented test data generator, goal-oriented test data generator, and intelligent test data generator have been automated"[1].

## 3. AUTOMATED TEST SCRIPT GENERATION FRAMEWORK

Our framework is basically designed for keyword-driven testing. In this Framework manually written test cases will be

processed by using intelligent techniques called NLP, in which we identify low- level as well as high-level keywords, implement the keywords as executable, create the test cases, create the driver scripts and execute the automation test scripts. This driver script which we generally create manually will be implemented automatically through this framework.

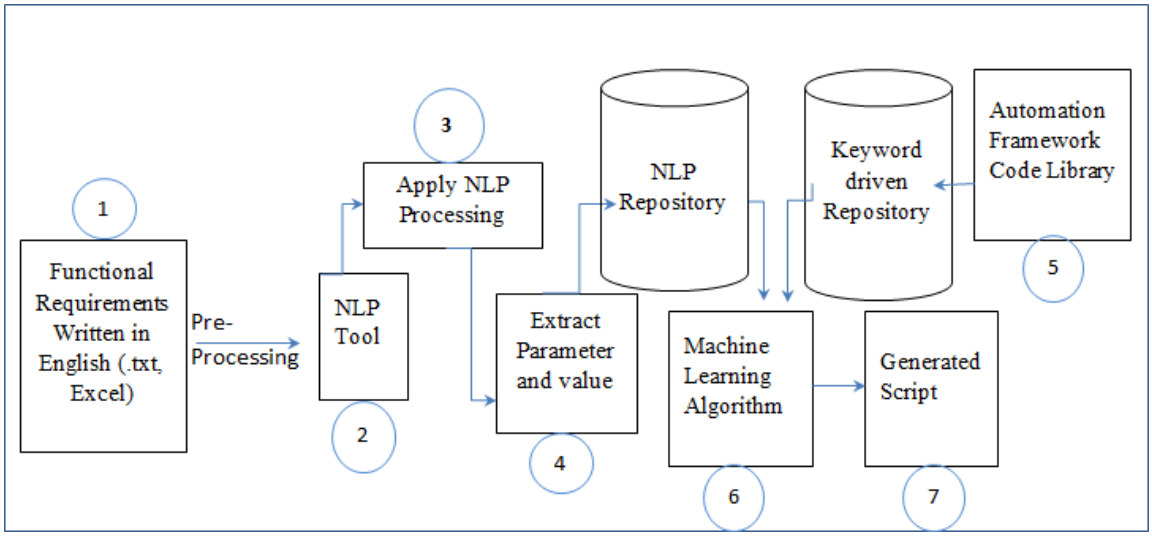


Fig. 1- Automated Test Script Generation Framework

This Automated Test Script Generation Framework follows some set of steps which are as below.

1. In the first step Natural Language parser will parse the functional requirement document, which content a test scenario with attributes expressed in natural language. This document is the input to the system.
2. In step two NLP tool will process the document. The Parser will parse the user test cases/test scenario written in natural language (English).

3 The NLP tool will parse the morphologic, syntactic and semantic approaches requirement of the document [4].

4. Through this parsing, we will extract the object, its value, and the handler. This information is used to match with available test building blocks of testing, and store them into an NLP repository.
5. In this framework, we are having another repository called Keyword Driven Framework Repository that will get data from the automation testing keyword driven framework. This will store the keywords and other parameters into the repository according to our selected keyword driven automation tool. “The idea behind the Keyword Driven approach in automation testing is to separate the coding from the test case & test step. This method helps a non-technical person to understand the automation very well” [6]. In the keyword driven test framework, all the operations and instructions are written in some external file like .CSV file. Example of .csv file is

| **Keyword** | **Locator** | **Locator Value** | **Parameter** |
|---|---|---|---|
| Navigate | | | https://www.flipkart.com/ |
| SendKeys | xpath | xpath [contains(text(), 'Enter your email')] | YOUR USER NAME |
| Click | xpath | [contains(text(),'Next')] | |
| SendKeys | id | Password | YOUR PASS WORD |
| Click | xpath | | Sign in |

Table 1. Example of .CSV file

This type of data will be maintained into keyword driven framework repository.

6. Our framework will get the data from both repositories, first Repository is the repository in which we collected

the parse data i.e. NLP Repository and another is the Keyword Driven Framework Repository, in which collected the data from Keyword Driven Testing Framework. This framework will map the data from both the repositories and it will apply Machine learning techniques.

7. After performing Machine Learning algorithms this framework will generate an automated test script. This will be the output of our framework. And this generated file can be an input for automation testing tools.

## 4. CONCLUSION

This framework is developed for automatic generation of test scripts for automation software testing in keyword driven approach. This will reduce the task of manually writing the test script for automation testing framework. This will reduce test-generation efforts and will save the cost and time. This will also save the time of the tester for learning new programming skills which are required to generate test scripts.

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