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Automated Web User Interface Testing Technique Based on JAVA SCRIPT and XML

Kyung-Hwan Kim, Jong-Won Lee, Hoe-Kyung Jung*

* Department of Computer Engineering, Paichai University, Doma2-Dong, SeoGu, Daejeon, Korea
E-mail: shwan10@naver.com, starjwon@naver.com, hkjung@pcu.ac.kr

Abstract

Lately an overly complicated and increasing number of web applications have been developed. However, in order to conduct the test for web apps user interface, the developer or person in charge of test is required to input test data into the screen for a long time according to the composition of web user interface. Automation of test data input through the use of JAVA SCRIPT and XML during the execution of test can make developer and person in charge of test conduct web user interface test very fast and precisely.

This paper proposes to input data automatically by using XML setting in regard to various data in the web user interface. It is shown that the automatic input of data can shorten the time consumed in the test by using the web application user interface test.

Key Words: Web test, User interface Test, XML, Web Apps

1. Introduction

Web application is developed by dividing the process into user screen and business logic and business logic is developed by utilizing various frame work. And user screen is recently developed by using HTML5, JavaScript and etc and application is developed by connecting user screen and business logic[1]

But developers take a lot of time to conduct unit test of web application. For the most of the time they input data into user screen and transmit the data and at the same time carry out the business logic test. However, input of data into user screen is very simple but test takes a lot of time. Most of the developers conduct the test through inputting and transmitting data with numbers or English letters randomly. And the test is carried out by testing the related user screen and business logic or inputting data or items. If there is no error in the review of the result, the user screen and business logic are usually considered as no problem. [2-4]

The reason why a developer conduct a test like this is that as data input into user screen is time consuming, a test is carried out by inputting data randomly. This method needs to verify many contents such as validation, input length, format, type and others by entering various input value into data input contents. And, in case of input of abnormal data and creation of data, the process of data exception cannot be verified. To solve this problem, in a large organization, the person in exclusive charge of quality control is usually conducting a test and
test is carried out based on test scenario defined in advance. The feedback of error occurring here will be given to a developer and based on this data, a developer corrects the error and then a test is conducted by being sent to the tester exclusive in the organization of quality control. The repeated test like this is time consuming and requires a lot of resources. [5-6]

This paper proposes the method of the function of user interface automatic input by using JavaScript application to offer the function to automatically process input of data in the part of the data input in web application. It provides the method to process the test of web application easily and fast to not only developer and the person in charge of quality control and so web application test will be processed promptly according to the paper.

This paper compares and analyzes the method for developer to enter data in person to see if the developer processes unit test fast by applying directly user interface developed by developer and utilizing it in creating and entering data in order to prove the method of proposed test.

2. Web user interface test

To automate web user interface test, test data needs to create and enter test data in web user interface. To create and enter data through the method to define SML as random data creation, data type, length, format and others, create data based on meta data, create type defined in XML, length, format and abnormal data for the abnormal test, create test data by reading text saved in existing database. Data is created and entered into web user interface. Figure 1. Shows phased test data creation.

Figure 1. Create data of phased web user interface test

This paper shows the method to enable the automatic input of the data in the related field by finding the characteristics of input tag required to enter data based on the characteristics of
type of input tag of HTML5 and creating test data fit to the characteristics of type. The characteristics of hidden, button, submit, image, and reset in input tag of HTML5 are not required to enter data and developer or tester can use it by clicking button.

If user calls test function of JavaScript in regard to the data creation of the test like Picture 2 of sequence diagram, data is created according to the method of test data creation by verifying parameter of test function.

Test data is created with various objects and methods and final data can be modified by user and data’s conformance test is conducted regarding all test data entered.

![Sequence diagram of test data creation](image)

Figure 2. Sequence diagram of test data creation

3. Implement web user interface test

Web user interface test is implemented like Figure 3 by using JavaScript and HTML5. By using angularJS code in JavaScript, ‘Hong’ character in the test type of nameTxt equivalent to input tag of DOM is entered in angularJS code as source code. Test tester created automatically like this way can enter data into input screen coincident with the name equivalent of ID of input tag.

```html
<DOCTYPE html>
<html>
<head>
<meta charset="UTF-8">
<title>test</title>
<script src="vendor/jquery/jquery.min.js"></script>
<script type="text/javascript">
$(document).ready(function () {
    $('#nameTxt').attr('value', 'User01');
});
</script>
</head>
<body>
<input id="nameTxt" type="text">
</body>
</html>
```

Figure 3. JavaScript and HTML5 source code

3.1 Screen to implement the automation of web user interface

The name of DOM object equivalent of the user input part of HTML tag is designated and
in the XML code of the Figure 5, Figure 6, the part consistent with the name is found and test data is created and data is entered in the input screen of the related ID.

![HTML code of test data creation](image)

![Test data XML code](image)

The correction of XML file enables the creation of various test data in order for a developer to create XML file change the value of test data for test data creation. Like this way, developer and tester can create test data of related user interface and test web user interface test as soon as possible in a various ways like this.

4. Performance analysis

Test screen using performance analysis selects about 5 screens in web application for work and lets 3 developers enter general test data and process with the use of web user interface automation S/W. With this way, test is conducted by measuring time from the start of data input till transmit button is pressed.

In the same screen test 10 times tests will be conducted and developer can select the way to enter data very fast.

To enter manual test data by developer 1, developer 2, and developer 3 shown in Picture 8 shows the individual difference and as the contents to be entered is increasing, data input will take a lot of time. In case of using web user interface automation, test data is created in less than 1 second after being created in the system. Regarding automation creation method, 10 input items or 30 input items takes time developer cannot feel and if a lot of test data is entered, time difference is expected to be occurred.
Figure 8. Time required for developer test according to the number of input items and input method

Performance test of data input by using web user interface automation is not easy to measuring the time of creating and entering test data to web user interface but the speed developer is feeling is thought of taking less than 1 second. The test is repeated a few times by using web user interface automation and it is confirmed that the automation method is reducing require time more than the manual test data input.

Through this it takes less time to take a test and developer can focus on the development of business logic, improve the quality of application and can develop more web user interface.

5. Conclusion

In order to take an effective web application test, research on the way to create test data in user interface is needed. To do this, this paper proposes the method to create test data in application by utilizing XML and defining data type, length and format.

This paper proposes the environment and method to enable the test of web application by developer's or tester's using web user interface test automation method, supporting test data creation in the test procedure, utilizing the method to enter test data automatically, and entering test data automatically.

It is considered to enable the creation of test data which can express more various information by fragmenting more and the method of test data created shown in this paper, accumulating sample data of test data and utilizing test data creation.

This paper designs and implements test platform by defining JavaScript and XML to proven proposed method and compares and analyzes the time to conduct test data input by applying application test by developer.

It decreases the time to enter data by 70% in web user interface by utilizing web user interface test automation method proposed in this paper. In addition, it is considered to reduce more time and cost in debugging of web application by processing the test with various test method.

The application limited to web user interface test is implemented but various applications
can be utilized and if test data creation method is applied, this method is expected to be applied in various application test filed.

This work was supported by the research grant of Pai Chai University in 2016.

References


*Corresponding author: Hoe-Kyung Jung, Ph.D.
Department of Computer Engineering,
Paichai University,
Doma2-Dong, SeoGu, DaeJeon, Korea
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<th>Authors</th>
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