Implementing White Box Testing for Evaluating the Inner Logic Code of the Research, Staffs, and Library Information System of Institute of Informatics and Business Darmajaya

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Abstract: Evaluating system was the common steps needed to be done before the system was run online. One of the familiar systems that was usually used was Blackbox Testing or White box Testing. Blackbox testing was used to test the user interface system and Whitebox testing was used to test the inner logic of system. This study used the Whitebox testing to test the inner code of the Research, Staffs, and Library Information System of Institute of Informatics and Business Darmajaya. The test covered 3 steps e.g., creating the flowgraph notation, 2) finding the cyclomatic complexity, and 3) conducting the test case. The result of this study was that the algorithm had 22 nodes and 25 edges. Cyclomatic Complexity formula was created to find 5 cases maximally. These cases were tested so that the system was passed. Therefore, it proved that the system was run and the Whitebox testing was good options for evaluating inner system.

Keywords: white box testing, software testing

1. INTRODUCTION

Testing was the final step to evaluate the system or application performance. Most of testing method was usually applied on the system evaluation was Blackbox Testing and White box Testing. (Anggi Andriyadi et al, 2019, p, 28). These two methods had differences. For instance, the Blackbox testing only evaluated the functions of the outside system without evaluating the inner code of testing. It tested the functions of the system and the user interface to test and check whether there were some miss logic or bugs when the user used the program. (Halimah and Anggi Andriyadi et al, 2019, p, 38) However, the Whitebox only evaluated the inner program of the system. It checked the logical of the system based on the used algorithm. The use of the white box testing method was carried out to (Anggi Andriyadi and Syela Angreani, 2018, p, 48):

- Provide assurance that all independent paths of a module were used at least once
- Use all logical decisions for all conditions true or false
- Execute all loops at the limit value and operational on each condition.
- Use internal data structures to ensure the validity of the decision path.

This study was to test and evaluate the inner code of the system of Research, Staffs, and Library Information System of The Institution of Research, Teaching, and Community Service Center of Institute of Informatics and Business Darmajaya. It tested the functions of the system and the user interface to test and check whether there were some miss logic or bugs because of bad coding. The function of this system was storing the data of IIB Darmajaya's lecturers and researches. Therefore, the Institution of Research, Teaching, and Community Service Center was able to manage the total publication of their research. This paper was a part of full report to The Institution of Research, Teaching, and Community Service Center to update their system for the future. (Dwi Sakethi et al, 2014, p, 27)

2. METHOD

In white box testing, there were 3 steps i.e.:

a. Creating flowgraph notation
b. Creating Cyclomatic complexity
c. Creating test case

The first step to use white box testing was creating the flowgraph notation from the algorithm or flowchart of the system of Institution of Research, Teaching, and Community Service Centre. Moreover, the total of Node and Edge from flowgraph notation was collected. The last steps were creating test case to check the validity of the system. (Dwi Sakethi et al, 2014, p, 28)

3. RESULT

3.1 Flowchart of the system

The flowchart of the system was as follow:

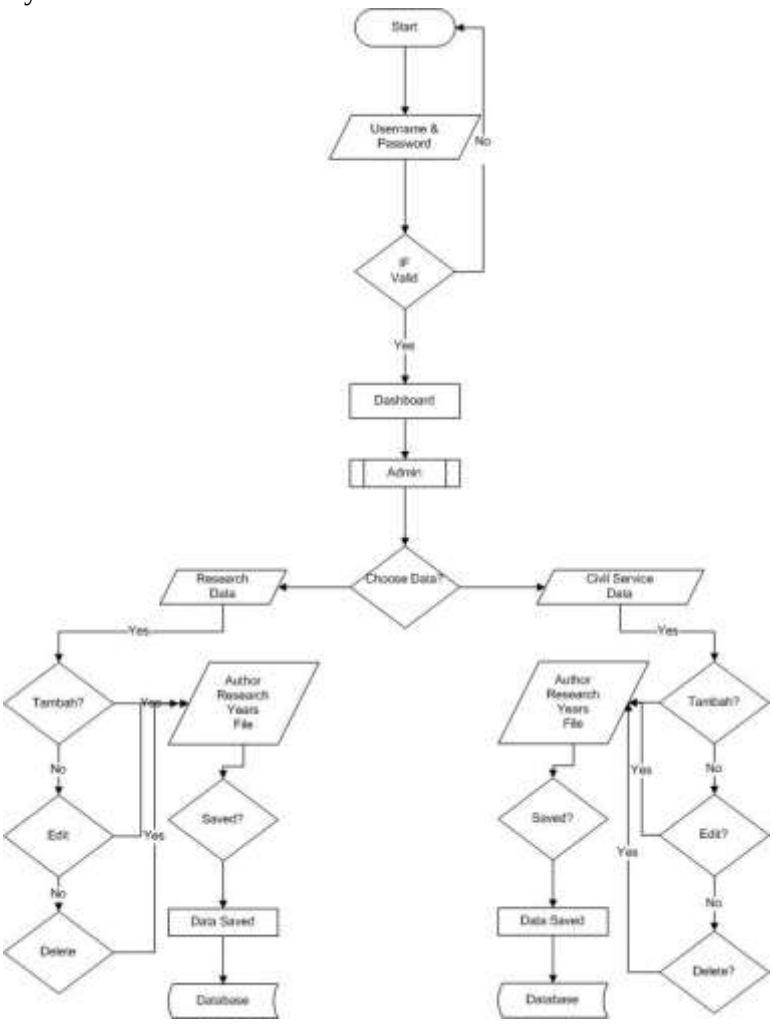

Figure 1. Flowchart of the Program

3.2 Flowgraph Notation

The flowgraph notation was as follow:

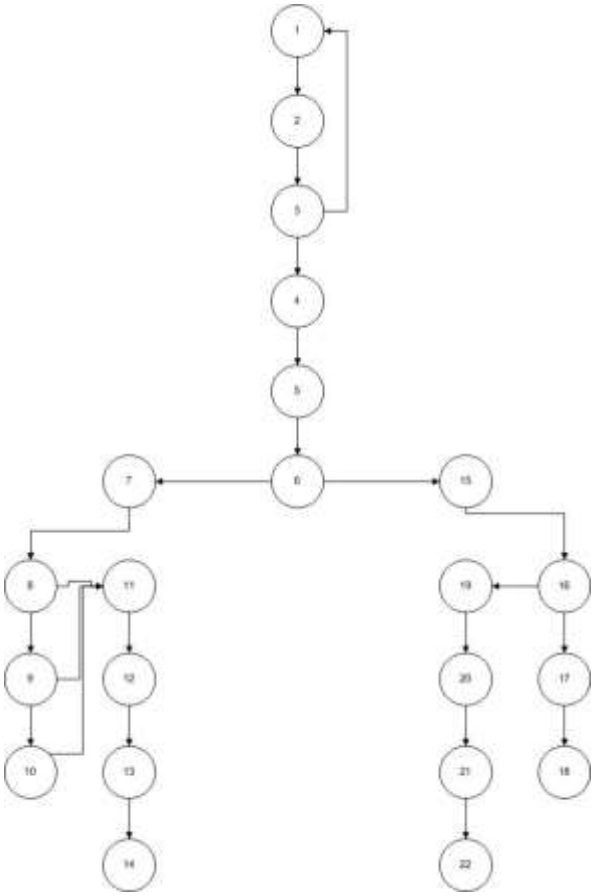

Figure 2. Flowgraph Notation

From the flowgraph notation, there were 25 edges showed from the arrow and there were 22 nodes showed from the process symbol of flow.

3.3 Creating cyclometric Complexity

The formula of Cyclometic Complexity was

$$V(G) = E - N + 2$$
$$= 25 - 22 + 2$$
$$= 5$$

From the formula, the maximum for the case evaluation was 5 cases. Therefore, we evaluated 5 cases to test.

3.3 Creating Test Case

Table 1. Test Case Table

No	Test Sample		Goal Output	Test Result
1	Program Study	Information System	Data was added, saved, stored and showed in Research Menu	Valid
	Semester	Summer		
	School Year	2017		
	File	pdf		
	Menu	Research		

No	Test Sample		Goal Output	Test Result
2	Program Study	Information System	Data was updated, saved, stored and showed in Research Menu	Valid
	Semester	Summer		
	School Year	2017		
	File	pdf		
	Menu	Research		

No	Test Sample		Goal Output	Test Result
3	Program Study	Information System	Data was deleted, removed in Research Menu	Valid
	Semester	Summer		
	School Year	2017		
	File	pdf		
	Menu	Research		

No	Test Sample		Goal Output	Test Result
4	Program Study	Information System	Data is added, saved, stored and showed on Research Menu	Valid
	Semester	Summer		
	School Year	2017		
	File	pdf		
	Menu	Civil Service		

No	Test Sample		Goal Output	Test Result
5	Program Study	Information System	Data was update, saved, stored and showed on Research Menu	Valid
	Semester	Summer		
	School Year	2017		
	File	pdf		
	Menu	Civil Service		

4. CONCLUSION

From the result of this evaluation, the system is passed the white box testing. The flow of the system is consistent with the algorithm that used. However, this system was able to be more digging in the future by testing another algorithm inside the system. Also, this research proves that the white box testing is suitable to evaluate the information system.

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