

Boundary Value Analysis and Decision Table Testing Methods in Software Testing

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ABSTRACT

Product quality is very important in the software development industry. The quality of the resulting product is strongly influenced by software testing before a software is deployed to customers. If a software has passed the test, it will be able to minimized the occurrence of obstacles when the software is used or operated. There are many software testing methods that can be used, from the black type to box testing and types of white box testing. in this study, a method of the black box testing type is used, namely boundary value analysis and decision table testing. The sample form being tested is part of the software used for the management of pension funds for a pension fund management institution employee. The sample form being tested is the periodic pension benefit claim submission form. then the test is carried out using the boundary value method analysis and decision table testing. Based on the business process rules of entry and form validation, a test scenario and data are created to be used for testing. After going through the testing process, the results showed that there were still things that needed to be improved on the sample form.

Keywords: testing, software, boundary, value, software

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INTRODUCTION

Making a software refers to a requirement that has been defined and agreed in advance. Software testing is needed to verify and validate that the software that has been built is in accordance with these needs. If the client is satisfied with the software made by a software company, usually they will tell their relationship. Then this will open up opportunities and potential for new clients who will use the software that was built. There are many methods that can be used to perform software testing. The Boundary Value Analysis method is a method of detecting errors by limiting the input to a certain limit, a value above or below a Boundary. The Decision Table Testing method uses a combination of several conditions to make decisions

In this study, the Boundary Value Analysis (BVA) and Decision Table Testing methods were used to test software for validating different inputs but complementing each other's form functions. In this study, a study was conducted in a software company that makes software based on specific client needs. This company makes software for insurance company operations, for company financial management, and for pension fund management company operations. From the several types of software made, in this study a sample of software used for managing a company's pension funds was taken. Then from the software a sample of the Periodic Pension Benefit Claim Form is taken. The main purpose of software testing is actually simple, namely to ensure that the resulting software meets the previously determined requirements. When the requirements of a system have been compiled, there should already be a test plan. In addition, a testing process requires an end goal that can be assessed so that the tester can stop testing when these goals are achieved

METHOD

In this study, the object of research is the software used for the management of employee pension funds. This study aims to see the application of software testing methods, so that no testing is carried out for all existing forms. One of the forms that will be tested is selected using the Boundary Value

The form chosen to be tested is the Periodic Pension Benefit Claim Submission form. This form is quite important because it is used to calculate the amount of periodic pension benefits. The results of this calculation will be used as the basis for paying pension benefits.

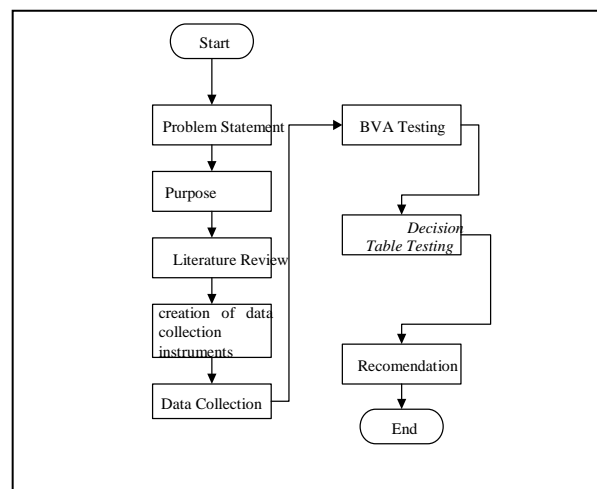


Figure 1. Research Stages

RESULTS AND DISCUSSION

Data Collection

Interviews were conducted with Business Analysts to find out the business process of Submission of Periodic Benefit Pension Claims. Based on the results of the interview, a form tester can be made.

1) Business Process for Submission of Periodic Pension Benefit Claims

When a participant submits a periodic pension benefit claim, the accumulated pension fund has been calculated automatically by another system. From the results of these calculations, participants can choose the Term Annuity and Reserve Portion, which will determine the periodic pension benefits received every month.

2) Rules of Input and Submit Form

Based on the appearance of the form in Fig. 4 there are several inputs. Some inputs are validated based on the allowable value range and some are validated based on mandatory or not. Input that is validated based on the range of allowable values will be tested using the method

Rule 1: PTKP, Term Annuity, and Reserve Portion all three are not filled, an error message appears

Rule 2: PTKP is not filled, Term Annuity and Reserve Portion are filled, an error message appears

Rule 3: PTKP and Term Annuity are not filled, Reserve Portion is filled, error message appears

Rule 4: PTKP and Reserve Portion are not filled, Term Annuity is filled, error message appears

Rule 5: PTKP is filled in, Term Annuity and Reserve Portion are not filled, an error message appears

Rule 6: PTKP and Reserve Portion, Term Annuity is not filled, error message appears

Rule 7 : PTKP and Term Annuity are filled, Reserve Portion is not filled, error message appears

Rule 8 : PTKP, Term Annuity, and Reserve Portion are filled in by the three, display the calculation results of pension benefits.

Test Results with BVA Method

(Boundary Value Analysis)

1) Test Result for Due Date Input

In the Due Date input there is no maximum limit, so there is only a minimum limit, namely the system date. In this study, the system date was set to September 1, 2019. The test results are shown in Table V.

R1 Rule Test Results

Table 1. R1 Rule Test Results

Data	Expected Result	Result	Conclusion
30/08/2019	Error	Error	Pass
01/09/2019	Error	Error	Pass

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02/09/2019	Sukses	Sukses	Pass
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Test Result for Account Number Input

In the Account No input there is a minimum limit of 8 letters and a maximum limit of 15 letters. The test results are shown in the table below.

Table 2. R1 Rule Test Results

R2 Rule Test Results

8 letters	Success	Success	Pass
9 letters	Success	Success	Pass
11 letters	Success	Success	Pass
14 letters	Success	Success	Pass
15 letters	Success	Success	Pass
16 letters	Error	Success	Failed

For rule R2, Account No limit, input validation still fails.

Account Owner Input Test Results

In the Account Owner input there is a minimum limit of 3 letters and a maximum limit of 100 letters. The test results are shown in table below

R3 Rule Test Results

Table 3. R1 Rule Test Results

Data	Expected Result	Result	Conclusion
2 letters	Error	Success	Failed
3 letters	Success	Success	Pass
4 letters	Success	Success	Pass
50 letters	Success	Success	Pass

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99 letters	Success	Success	Pass
100 letters	Success	Success	Pass
101 letters	Success	Success	Pass

For the R3 rule, the Account Owner constraint, input validation still fails.

Recommendation

Further research is conducted to use other methods or to test another form that has a different business process. Thus, the software created has truly met the needs of business processes. Software testing using Boundary Value Analysis and Decision Table Testing methods can be used to test whether the software made is in accordance with the needs of business processes. For those who have not passed the test, it is necessary to make improvements so that they are in accordance with the provisions of the business process.

CONCLUSION

By using the Decision Table Testing method, software testing can be carried out to validate the behavior of the system in displaying output based on the combination of given inputs. The sample form tested in this study has complied with the applicable business process requirements. Software testing using the Boundary Value Analysis method can test whether the input value entered into the system is within the range of limits allowed by the business process. In the sample form tested in this study, there are still bugs that need to be fixed. Further research can be done to test the software using different methods, or test other forms that have different business processes.

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