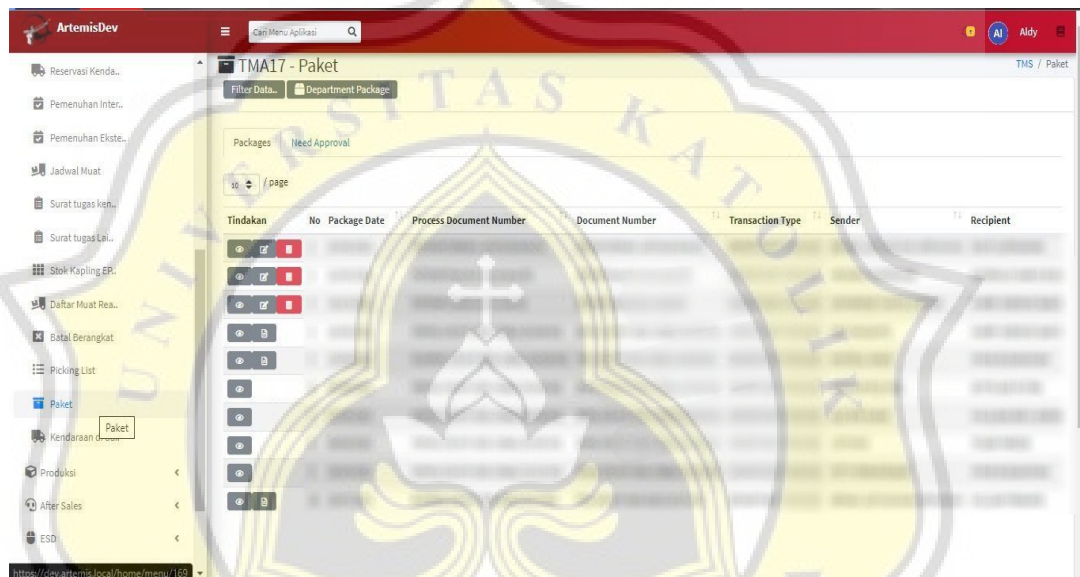


## CHAPTER 5

### IMPLEMENTATION AND RESULTS

#### 5.1. Implementation



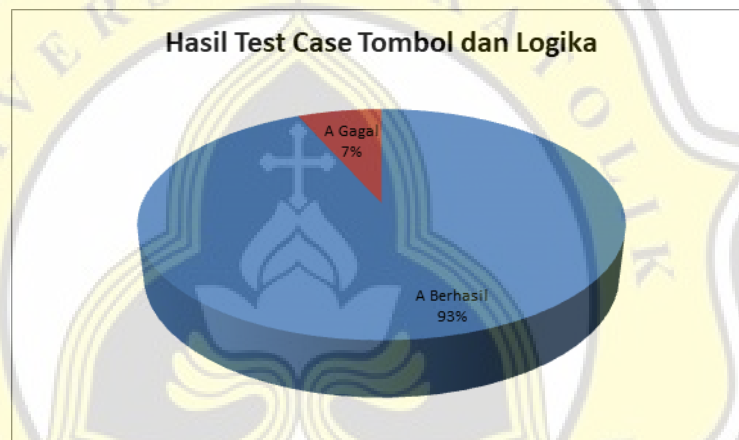
*Figure 5.1 UI of System*

The picture above is the UI of the system being tested using the Black Box Testing method with the Equivalence Partitioning technique. Black box testing is carried out to test the functionality of the system carried out on the buttons on the system to be tested to determine the function of these buttons and also to test some of the logic functions that are run on the system to be able to adapt to the concepts that have been created. Testing using the Equivalence Partitioning technique is also carried out to assist in system testing, namely by making a test case that contains a list of tests that will be carried out so that they can be carried out properly and in accordance with the order in the concept. This test focuses on the Package Menu and on the Department Packages section. This test is carried out 5 times to ensure that the

system functions are not wrong or missed. By repeating the test 5 times, it can be ascertained that the results obtained must be precise and accurate.

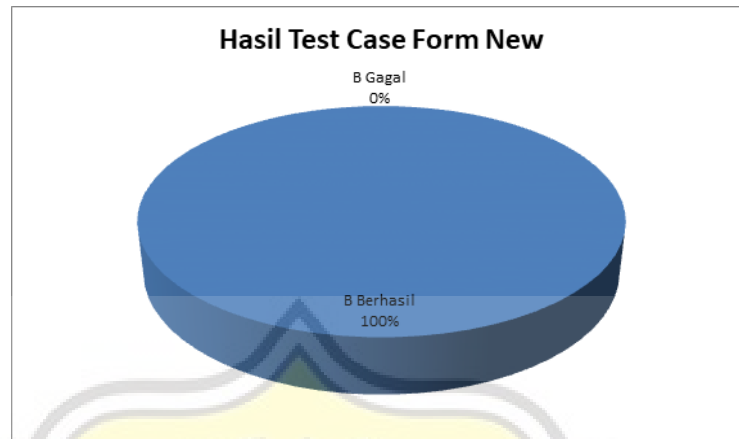
## 5.2. Results

After testing using the Black Box Testing method with the Equivalence Partitioning technique on a set of test cases that have been made, the following results are obtained:



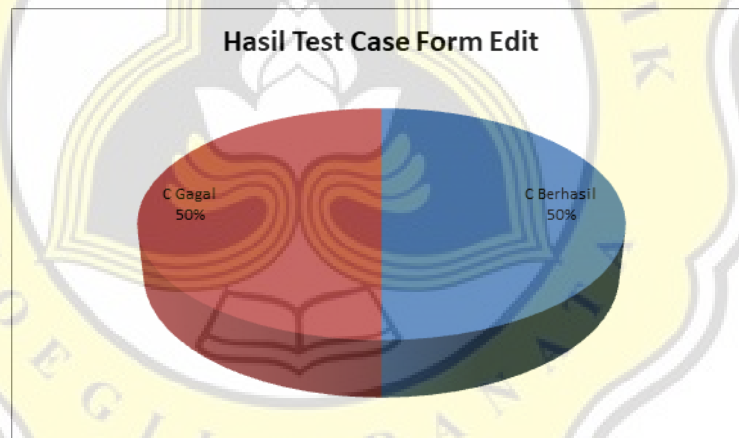
*Figure 5.2 Result Test Case Part A*

In the test case test part A there are 30 test cases and the successful test results are 93%. Testing part A contains all the key functions and logic that exist in the system and testing is done using the Equivalence Partitioning technique.



*Figure 5.3 Result Test Case Part B*

In the Test Form New part B there are 18 test cases and the test results are 100% successful. This part B test contains all the functions on the New Form.



*Figure 5.4 Result Test Case Part C*

There are some missing data which not shown at the form edit as the data on the sender is empty, which must be filled in and matched when adding a new one. Therefore in test case test part c found success rate 50% because only has 2 test case in form edit.

### 5.3. Benchmark and Comparison

The benchmark used in this test so that it can be used as the basis for the truth of a test being carried out is the concept being tested. The concept becomes a benchmark because it becomes a reference in a system that is made. In this concept there are several examples that the author takes as follows:

Action :  
1 **Data Filter**  
Saat click filter, maka muncul input filter data

Package Date	<input type="text"/>	to	<input type="text"/>
Process Document Number	<input type="text"/>	to	<input type="text"/>
Document Number	<input type="text"/>	to	<input type="text"/>
Expedition Type	<input type="text"/>	to	<input type="text"/>
Delivery Type	<input type="text"/>	to	<input type="text"/>
Package Category	<input type="text"/>	to	<input type="text"/>
Recipient	<input type="text"/>	to	<input type="text"/>
Status	ALL <input type="checkbox"/>		

**Search**

*Figure 5.5 Data Filter Function on Concept*

Validasi :

1 Jika field mandatory tidak diisi, maka muncul error message

Delivery Time \*   
Please fill out this field

*Figure 5.6 Validation Logic on Concept*

Action :

a. **Back**

Kembali ke main display program

b. **Save**

Validasi data sama seperti saat input New data

Jika tidak ada error program, maka update data di tabel packages

Selesai update data, maka muncul message berhasil diedit

**Data has been successfully edited**

refresh data tabel

*Figure 5.7 Save Logic on Concept*

Comparison is used to compare the methods before and after using the Black Box Testing method with the Equivalence Partitioning technique. The comparison used is the result of a trial from the author who still uses the manual method and also only records if there are program or function errors, while the Black Box Testing method with the Equivalence Partitioning technique is carried out by making a test case that contains the concept of the system to be tested. So that it can be found a significant difference where before using the Black Box Testing method with the Equivalence Partitioning technique it is arguably less specific because there are no records of success for correct program functions and only notes for programs that still have errors. Here are the test results from the author before using the Black Box Testing Method with the Equivalence Partitioning technique.



**Figure 5.8** Sample Test Results Before Using Black Box Testing Method With Equivalence Partitioning Technique

The picture above is the result of testing by manual method where manual testing is less specific because it does not record all the concepts to be tested, only records when there are errors. The notes on the manual test are intended to be given to the ESD team so that the ESD team can revise and match the concept. Therefore, the test results using this manual method will later be used to compare the test results using the Black Box Testing method with the Equivalence Partitioning technique.

No	Deskripsi Pengujian	Hasil yang diharapkan	Hasil Pengujian
A 01	Saat klik tombol Filter Data, maka akan muncul input Filter Data	Muncul Input Filter Data	Filter Data tidak muncul
A 02	Saat klik tombol Need Approval, maka akan bergeser ke table Need Approval	Berganti ke table Need Approval dari yang sebelumnya table Packages	Berganti ke table Need Approval dari yang sebelumnya table Packages

*Figure 5.9 Sample Test Results After Using Black Box Testing Method With Equivalence Partitioning Technique*

The picture above is the result of testing using the Black Box Testing method with the Equivalence Partitioning technique using a test case that contains all the functions in the Package Program. Testing is carried out based on the existing concept, namely what is tested, how the results are based on the concept, and the results of the tests that have been carried out. The test results show that the test is carried out according to the concept and records all functions and logic that are running, whether they are true or false.

#### 5.4. Binary Classification

##### a. Test Case Part A

*Table 5.1 Table Matrix Test Case Part A*

		Predicted	
		Positive	Negative
Actual	Positive	140	0
	Negative	10	0

$$\text{Recall} = \frac{TP}{TP+FN} = \frac{140}{140+0} = 1$$

$$\text{Precision} = \frac{TP}{TP+FP} = \frac{140}{140+10} = 0,93$$

$$F1 = 2 \cdot \frac{\text{Precision} \cdot \text{Recall}}{\text{Precision} + \text{Recall}} = \frac{TP}{TP + \frac{1}{2}(FP+FN)}$$

$$2 \cdot \frac{0,93 \cdot 1}{0,93 + 1} = \frac{140}{140 + \frac{1}{2}(10+0)}$$

$$2 \cdot \frac{0,93}{1,93} = \frac{140}{145}$$

$$0,96 = 0,96$$

$$\text{Accuracy} = \frac{TP+TN}{TP+TN+FP+FN} = \frac{140+0}{140+0+10+0} = 0,93$$

In the Test Case Part A test there are 30 test cases where 140 test cases are True Positive (TP), there is no False Negative (FN), and 10 test cases are False Positive (FP), then the result of Recall is 1, and the result of Precision is 0,93. The result of F1 is  $0,96 = 0,96$ .

b. Test Case Part B

**Table 5.2** Table Matrix Test Case Part B

		Predicted	
		Positive	Negative
Actual	Positive	90	0
	Negative	0	0

$$\text{Recall} = \frac{TP}{TP+FN} = \frac{90}{90+0} = 1$$

$$\text{Precision} = \frac{TP}{TP+FP} = \frac{90}{90+0} = 1$$

$$F1 = 2 \cdot \frac{\text{Precision} \cdot \text{Recall}}{\text{Precision} + \text{Recall}} = \frac{TP}{TP + \frac{1}{2}(FP+FN)}$$

$$2. \frac{1.1}{1+1} = \frac{90}{90+\frac{1}{2}(0+0)}$$

$$2. \frac{1}{1} = \frac{90}{90}$$

$$1 = 1$$

$$\text{Accuracy} = \frac{TP+TN}{TP+TN+FP+FN} = \frac{90+0}{90+0+0+0} = 1$$

In the Test Case Part B test there are 18 test cases where 18 test cases are True Positive (TP), there is no False Negative (FN), and there is no False Positive (FP), then the result of Recall is 1, and the result of Precision is 1. The result of F1 is  $1 = 1$ .

c. Test Case Part C

**Table 5.3** Table Matrix Test Case Part C

		Predicted	
		Positive	Negative
Actual	Positive	5	0
	Negative	5	0

$$\text{Recall} = \frac{TP}{TP+FN} = \frac{5}{5+0} = 1$$

$$\text{Precision} = \frac{TP}{TP+FP} = \frac{5}{5+5} = 0,5$$

$$F1 = 2. \frac{\text{Precision} \cdot \text{Recall}}{\text{Precision} + \text{Recall}} = \frac{TP}{TP + \frac{1}{2}(FP+FN)}$$

$$2. \frac{0,5 \cdot 1}{0,5+1} = \frac{5}{5+\frac{1}{2}(5+0)}$$

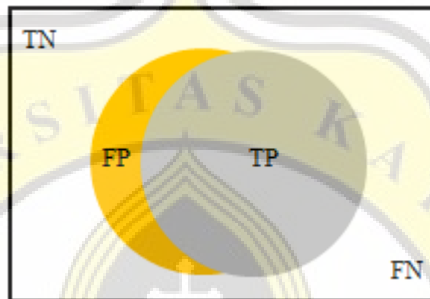
$$2. \frac{0,5}{1,5} = \frac{5}{7,5}$$

$$0,66 = 0,66$$



$$\text{Accuracy} = \frac{TP+TN}{TP+TN+FP+FN} = \frac{5+0}{5+0+5+0} = 0,5$$

In the Test Case Part C test there are 2 test cases where 1 test case is True Positive (TP), there is no False Negative (FN), and 1 test case is False Positive (FP), then the result of Recall is 1, and the result of Precision is 0,5. The result of F1 is  $0,66 = 0,66$ .



*Figure 5.10 Diagram Venn High Recal High Precision*

At this stage, the calculation results from Recall as much as 100% and Precision 81% with True Positive results as much as 235, True Negative 0, False Positive 15, and False Negative 0. These calculations were obtained from testing 3 part test cases. The results obtained indicate that this test is included in High Recall High Precision, High Precision because it prefers the occurrence of True Positives and really does not want the occurrence of False Positives and for High Recalls because it prefers the occurrence of False Positives rather than the occurrence of False Negatives. Then the tendency of this test tends to be Recall because the results obtained from Recall are 100% for the 3 parts that have been tested compared to the results from Precision which get 81%.