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Analysis of Planning Implementation Software Testing using the Equivalence Partitions testing method

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Abstract - *This study aims to make an analysis of planning the implementation of e-Hospital information technology testing: Presentation of Location Information and Scheduling of Hospital Doctors in the City of Bandung. It aims to analyze the extent of the suitability of the application of Black Box testing in minimizing the risk of failure of a system when implemented. Make an analysis of planning the implementation of e-Hospital information technology testing, the method used is black box testing as a method of testing the implementation of e-Hospital information technology, which is related to providing location information and scheduling of doctors at hospitals in Bandung, as for the steps, between others: Determination of Test Cases for Software Testing, Initialization of Standards for Input and Output Grade Partitions, Testing of the Equivalence Partitions Method Testing, Value of the Effectiveness Level of the Equivalence Partitions Method. The findings of this study can provide an analysis of the appropriateness of the method used in the process of testing the implementation of information technology in the form of e-Hospital, which can provide convenience for the general public in the city of Bandung or for migrants or tourists who are on vacation in the city of Bandung in obtaining information on the existence hospital location and scheduling in the city of Bandung. Further observations are needed in the future to provide information related to the use of software testing methods that can have an impact in the form of minimizing the risk of failure of a system when implemented. This research is expected to be able to provide a reference in carrying out the software testing process, especially the use of testing methods, in essence providing a guarantee and minimizing the risk of failure of an application when it is implemented.*

Keywords - *Information Technologi, Software Testing, Black Box Testing, Equivalence Partitions Method, e-Hospital.*

I. INTRODUCTION

Information technology is currently experiencing rapid development, almost in all fields of industry have implemented information technology, as well as application development in making it easy for users to get information according to their needs, one of which is related to the presentation of location information and scheduling of doctors at home sick in the city of Bandung. implementation of information technology, one of which is the application of applications in terms of managing data into information and managing information into knowledge, not without obstacles, obstacles that often occur in general, applications that are implemented in the industry do not all go according to needs, this happens the process of testing software has not optimized or even skipped.

as the solution to problems is one of them by applying to the software testing process or application to be implemented in the industry or company. testing is the process of finding fault with each software item, recording the results, evaluating every aspect of each component of the system and evaluating all facilities of the software developed [1]. testing is a stage in the software development process that should be done and cannot be skipped because it is part of the stages in software development, then after testing how we can carry out an analysis of the testing process especially the use of the method used.

as well as the e-Hospital application, is one of the web-based applications that can provide convenience to users in obtaining information related to the location and scheduling of hospital doctors in the city of Bandung. before implementation this application should be tested in advance in the form of verification and validation of the application. this is done in an effort to evaluate whether the application is developed in accordance with the phases of the

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requirements set at the beginning of the development and whether the applications produced are in accordance with the requirements that have been set.

thus the testing process is a stage that must be done in every software development process, it is done in order to produce quality applications and minimize the risk of system failure when it will be implemented.

II. LITERATURE REVIEW

1. The Literature Application

Application is a program command that is found in a computer. Which if executed by the user will provide a number of functions while displaying the information desired by the user [3].

2. Black Box Testing

Black Box Testing is a complementary approach to the White Box technique, because black box testing is expected to be able to uncover a wider range of errors than the White Box technique. Black Box Testing focused on testing the software functional requirements, to obtain a series of input conditions corresponding to the functional requirements of a program [5].

The use of the Black Box testing method consists of three, namely [1], [2], [5]:

a. Graph-based testing.

b. Equivalence Partitioning (Equivalence Partition).

c. Boundary Value Analysis.

3. Equivalence Partitioning (Partisi Equivalence)

Equivalence partitioning is a method that divides the input domains of a program into data classes, determining test cases by revealing error classes, so that it will reduce the total number of test cases. If a link weight has a transitivity, symmetrical, and reflexive pattern then there will be an equivalence class. The equivalence class represents a set of valid and invalid conditions for input conditions.

Specifically, an input condition can be a numeric price, a price range, a series of related prices, or a Boolean condition [1].

Determination of Equivalence Classes [1], [2], [5]:

a. If the input conditions determine a range, then an equivalent class invalid and two invalid specified.

b. If an input condition requires a special price, then one valid equivalence class and invalid two are specified.

c. If a condition determines the members of a set, then one class A valid equivalent or two invalids is specified.

d. If an input condition is boolean, then one class is valid and one the others are determined.

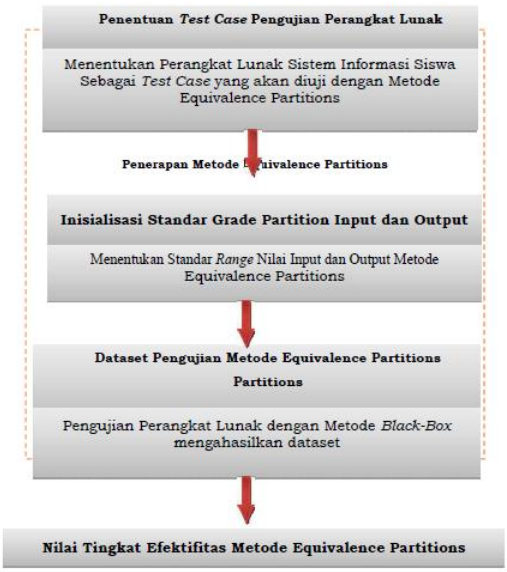

Fig. 1. The stages of software testing models

III. METHOD

1. Test Case Perangkat Lunak

at this stage of the test case, modules explain what will be done the testing process, as for the module to be tested include:

Test Case :1

Test Case Name: Login

Description: Interface that functions as an account for the user

Pre-Condition: Enter your username and password

No	Action	Expected System Respon	Result
Basic Paths	Users enter a username and password	1. Validate your username and password 2. Displays the Admin page	Passed Passed

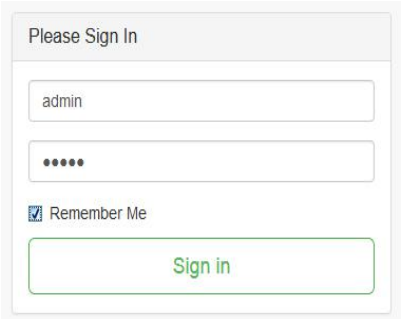

Fig. 2. Login Interface

Test Case : 2

Test Case Name: Main Menu

Description: This page is a page that contains the GIS map the distribution of Bandung city hospital, the Hospital Information Facility and Physician established schedule

Pre-Condition: select the location and schedule of doctors at a hospital in Bandung

No	Action	Expected System Respon	Result
Basic Paths	1. Select Type Hospital	1. Displays Hospital Type	Passed
	2. Select the nearest hospital location	2. Displays Hospital Location	Passed
	3. Select Hospital Doctor Schedule	3. Displays the Hospital Doctor's Schedule	Passed

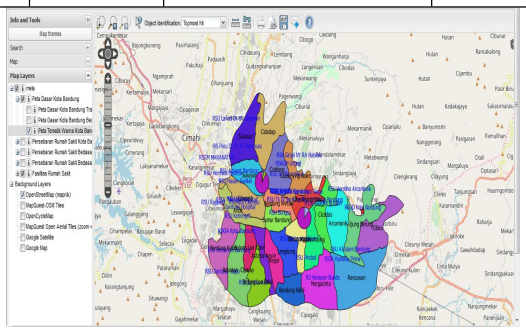

Fig. 2. Main Menu Interface

Test Case :3

Test Case Name: Manage Data Hospitals

Description: Interface used to manage and manipulate data in hospital

Pre-Condition: Input data Hospital information

No	Action	Expected System Respon	Result
Basic Paths	1. Select the Hospital Data menu 2. Select add, edit or delete Hospital data	1. Displays the Hospital data page 2. Displays form added, edit or delete Hospital data	Passed Passed

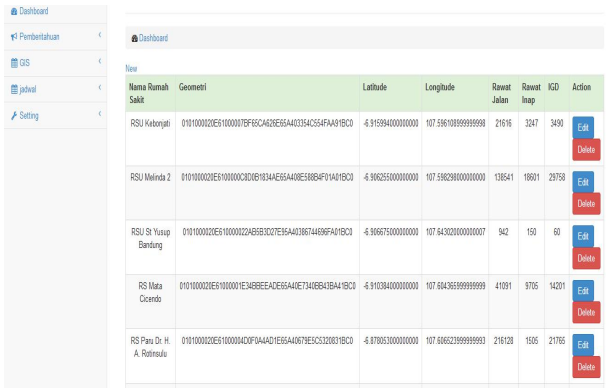

Fig. 3 Manage Data Hospitals Interface

Test Case :4

Test Case Name: Manage Physician Practice Schedule

Description: Interface that manages data Doctors Hospital practice schedule which aims to present the most relevant information Doctors Hospital practice schedule.

Pre-Condition: Input Data Doctor practice schedule

No	Action	Expected System Respon	Result
Basic Paths	1. Select the Manage Physician Practice Schedule Data menu 2. Select add, edit or delete Physician Practice	1. Displays Physician Practice Schedule Data menu data page 2. Displays form added, edit or delete Physician	Passed Passed

	Schedule Data menu	Practice Schedule Data menu	

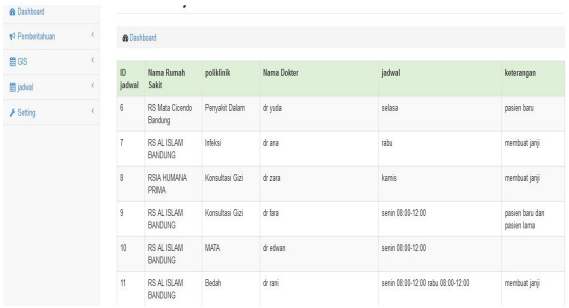

Fig. 4 Manage Data Hospitals Interface

Test Case: 5

Test Case Name: Manage Data User

Description: Interface used to manage and manipulate data in User

Pre-Condition: Input Data User Information

No	Action	Expected System Respon	Result
Basic Paths	1. Select the User Data menu **2.** Select add, edit or delete User Data Menu	1. Displays the Manage Data User page **2.** Displays form added, edit or delete Manage Data User	Passed Passed

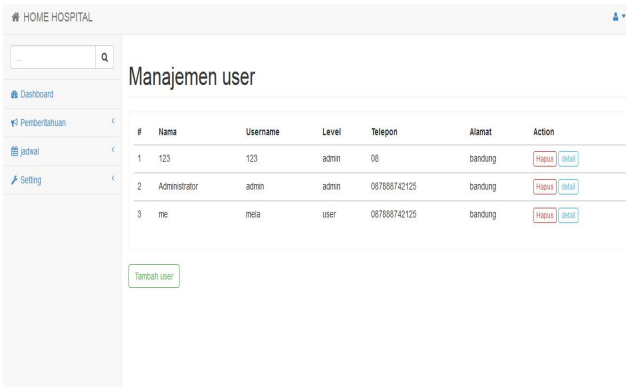

Fig. 5 Manage Data User

2. Score Grade Partition Software Testing

Table 2: Score Grade Partition Software Testing

No	Form Name	Description of Error in the Function	Number Of Error	Score Error
1	Login	Interface that functions as an account for the user	0	0
2	Main Menu	This page is a page that contains the GIS map the distribution of Bandung city hospital, the Hospital Information Facility and Physician established schedule	0	0
3	Manage Data Hospitals	Interface used to manage and manipulate data in hospital	1	10
4	Manage Physician Practice Schedule	Interface that manages data Doctors Hospital practice schedule which aims to present the most relevant information Doctors Hospital practice schedule	1	10
5	Manage Data User	Interface used to manage and manipulate data in User	0	0

3. Repair software error finding.

In this table are described related to the findings of errors in the software will be implemented, as for the proposed improvements to be proposed are:

Table 3: Repair Software

Error in the Function	Description	Solutions
Manage Data Hospitals	If an error occurs on Functions, Data Structures, Interface, initialization and Performance.	a. Software Upgrade, if the latest version has been created. b. Configuration

		Input, output process data in accordance with the requirements
Manage Physician Practice Schedule	If an error occurs on Functions, Data Structures, Interface, initialization and Performance.	a. Software Upgrade, if the latest version has been created. b. Configuration Input, output process data in accordance with the requirements

FINDING AND DISCUSSION

E-Hospital Software that has the purpose of making it easy for users to present information related to the location and schedule of doctor's practices at hospitals in the city of Bandung, but before the software will be implemented the planning process of testing the software is done, this is done in order to find as many errors as possible in order to produce quality software and minimize the failure of implementing the software, during the testing process there are findings on several modules that are not in accordance with system planning or software development, this can cause a "cost center" which results in suboptimal software development that results in inefficient and ineffective system development, these findings can be described in the table below:

Table 1: Sample 1

Criteria	Category	Number Of Error	Percentage
Login Form	Passed	0	100% (Valid)
Main Menu	Passed	0	100% (Valid)
Manage Data Hospitals Form	Failed	2	Invalid
Manage Physician Practice Schedule	Failed	2	Invalid

In planning the testing process of software, basically a tester can use a variety of available testing methods, of course, tailored to the needs of a tester and the software that is built.

in this condition the tester uses the Black Box Testing method in planning software testing, as a consideration the tester uses Black Box testing as the method used for various reasons, including:

1. In terms of large code segments considered efficient.
2. Testing is done based on specifications, does not require up to code access.
3. There is a separation between User Perspective and Developer.
4. Can judge the extent of the consistency of a software.
5. Software specifications can be determined at the beginning.

These points are the reason the tester uses the Black Box Testing method, the software built has code that can be categorized as a complex, so if using the White Box Testing method requires a relatively long time, testing with the Black Box Testing method is chosen, testing can be used based on pre-determined software specifications, so they don't need access to the software code.

thus in the process of selecting test methods, the Black Box Testing method is very suitable for the conditions of the software being built.

V. CONCLUTION

Based on the description that has been explained in the previous section, it can be concluded that it is related to the E-Hospital software testing process, which has the function of providing convenience for users and at the same time presenting information related to the location and schedule of doctors at hospitals in Bandung, among others :

1. In the software testing process with the Black Box testing (equavalence partitioning) method referred to, there are findings of the test results, in the form of functional errors in the hospital data management form and errors in the functional form of the doctor's schedule data management.
2. The results of this finding, the tester proposes to have an improvement on the errors in question, it aims to optimize the performance of the software.
3. Software testing using the black box testing method can provide documentation of test results containing information on the suitability of the software being tested with the specified specifications.

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