Application of the Internship Process and Testing using the Blackbox Method

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Abstract: Internships that are still done manually require a relatively long time so that it is not uncommon to get complaints from anyone. So that the data processing process must adapt to the times, namely through internet technology so that data processing can be done anywhere and anytime. Therefore, based on the existing background, the problem is formulated, how do application developers for the Internship process and testing using the black box method so that the application can help the process of implementing the Internship through the media website to support the independent and independent campus program studying in the electrical engineering department at the Manado State Polytechnic. The purpose of this study is to produce an Apprenticeship process application that has been tested using the black box method so that the application is expected to assist the Internship implementation process. The method used to develop the application system is a waterfall with details of analyzing the system on an existing or ongoing apprenticeship system - Designing new systems and software - Implementing and testing system units - System integration and testing - Operation and maintenance. The Black box method is used to perform testing by dividing the research into 2 sections on the login function with 4 scenarios and the menu function with 10 scenarios. The result is that the application for the internship process was successfully made according to the initial design and the testing was successful according to a pre-determined scenario. The performance test results from 22 respondents on average 62.3% agree and 26.6% answered strongly agree. This shows that the user can still use this visualization model well.

1 INTRODUCTION

In 2020, Permendikbut No. 3 of 2020 was issued, the Minister of Education and Culture issued a policy of Merdeka Belajar – Kampus Merdeka which is a framework to prepare students to become strong scholars, relevant to the needs of the times and ready to become leaders with a high national spirit. Students are given the opportunity to enrich and improve their competencies in the real world according to their passions and ideals. The purpose of this government program, of course, requires close interaction between universities and the world of work. Universities must know the current needs of the company so that they can prepare students to enter the world of work.

Article 15 paragraph 1 describes the forms of learning activities that can be carried out inside and outside the study program. There are 8 forms of learning activities, one of which is internships or field work practices carried out outside the study program outside the campus.

In supporting the government's program of Merdeka Learning – Merdeka Campus, Manado State Polytechnic seeks to prepare students to be able to prepare themselves to enter the world of work with the Internship program. Obstacles in the form of administrative that must be carried out in internship activities are not small and administrative activities that have not been computerized result in a lot of time for their services.

The administrative process which is still done manually takes a relatively long time so it is not uncommon to get complaints from students.

The data processing process must adapt to the times, namely through internet technology so that data processing can be done anywhere and anytime. Moreover, it is related to the current era of the Covid 19 Pandemic which allows the public to reduce mass gatherings that involve many people. So that the manual administration process must be reduced.

Therefore, based on the existing background, the problem is formulated, How is the application of the integrated Internship process in the electrical engineering department at the Manado State Polytechnic and testing using the blackbox method so that the application can help the Internship implementation process through the media website to support the independent campus program and independent learning.

The purpose of this study is to develop an integrated application for the internship process in the electrical engineering department at the Manado State Polytechnic and testing using the blackbox method so that the application can assist the process of implementing the Internship through the media website to support the independent campus program and independent learning.

2 RESEARCH METODOLOGY

The research method that will be used to build an integrated Apprenticeship process in the electrical engineering department at the Manado State Polytechnic is as follows:

Methods of field study (observation study) and literature study (library study). This method is used for problem identification.

The application development of the internship process requires procedures to identify problems, design systems using data flow diagrams and use cases.

Waterfall method, this method is needed to build a model of the system that will be generated in the computer-based information system section, because based on this method it will be a reference for building a system based on analysis of system requirements, functions, data flows, databases.

The system development method uses the Waterfall method which consists of - System analysis on existing or ongoing apprenticeship and final project systems - New system and software design - System unit implementation and testing - System integration and testing - Operation and maintenance.

Functional testing uses the black box method to see the results when the system is run whether the system can send data from the user, whether the server responds and displays information.

System Design, several analytical tools are needed to assist in conducting the analysis in this research.

The activities planned for this research are:
• Procurement of research related literature
• System analysis

• System planning
• Implementation
• Program Testing.

Research Instruments, this research requires several instruments to support analysis and research: Information system modeling components as follows. Hardware consists of Laptop/PC, peripherals (printer) and network. Software is a collection of commands/functions written with certain rules to instruct the computer to carry out certain tasks. Software can be classified into Operating Systems (Windows 7/8 and 10), Utilities (Anti Virus, Speed Disk), and Languages (3 GL and 4 GL).

2.1 Conceptual Framework

Conceptual Framework is a form of thought framework that can be used as an approach in solving problem. Usually this research Framework uses a scientific approach and demonstrates relationships between variables in the analysis process.
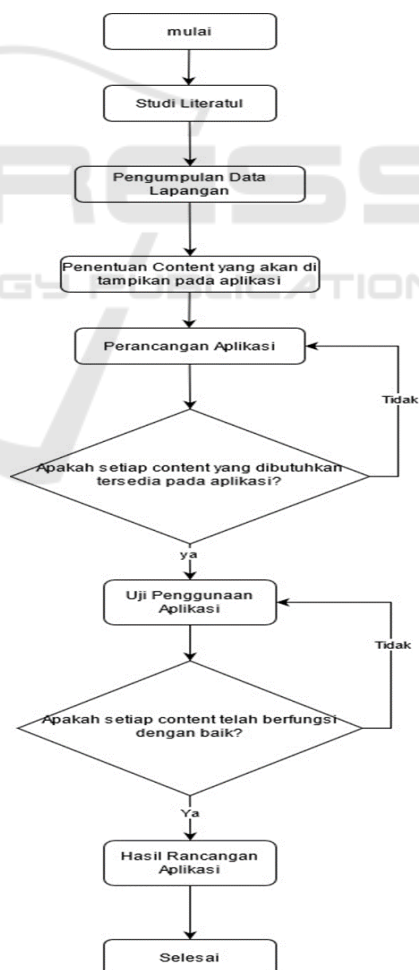

Figure 1: Conceptual Framework.

2.2 System Architecture

The planning of Information services and Monitoring tourism destinations in Southeast Minahasa District was built to facilitate the users in this case tourists, in search of tourist information, especially the stub objects in southeast Minahasa Regency.

Figure 2 is architecture system consisting of three main parts, namely client, application server and database server.
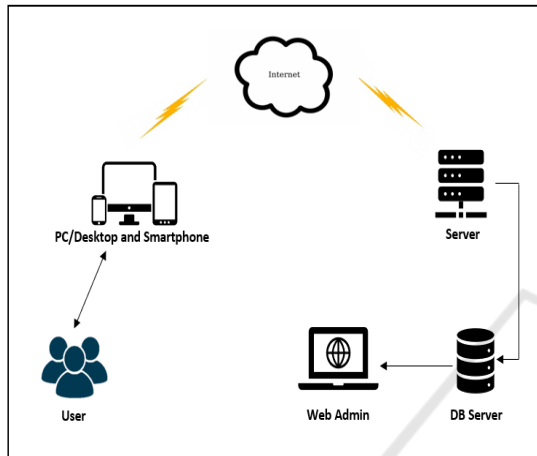

Figure 2: Internship Process Application Architecture.

3 ANALYSIS AND DESIGN

Problem solving technique by dividing it into small components and finally bringing it back together into a complete and integrated system is a good technique because it can clearly describe the system to be designed.

3.1 System Flowchart

Fig. 3, is the result of an analysis of the system requirements that will be developed into an application for the internship process which consists of 4 users, namely students, the company where the internship is located and the academic section or study program from which the internship student originates.

The application system has functions to support the internship process, such as data on internships, daily reports, report forms, student attendance for internships, projects.

Analysis and design are important requirements that can be used at the beginning of system development or when the system is revised with the aim of getting a better system.
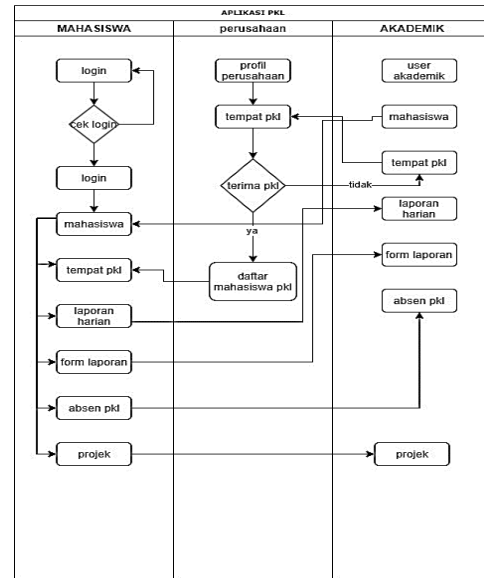

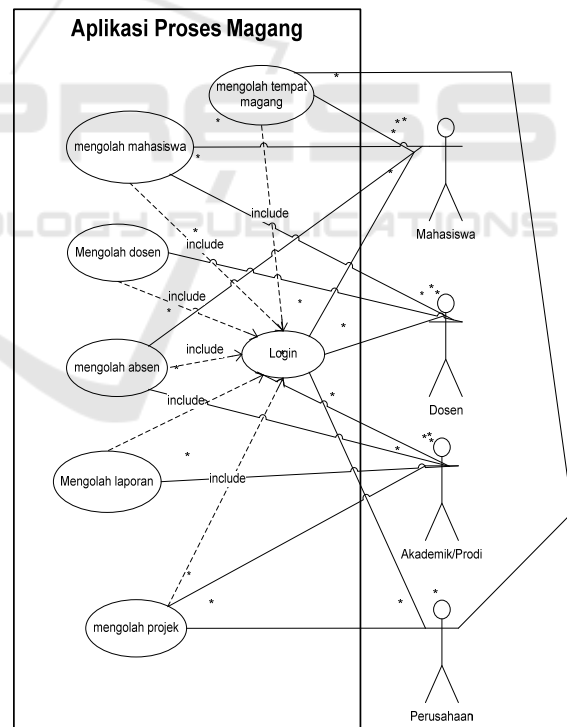Figure 3: System Flowchart.

3.2 Use Case Diagram

Figure 4: Use Case Diagram.

Fig. 4, is the design of the functional requirements of the apprentice process application system with 4 actors who can interact with the application. All processing functionality can be used if the actor has logged in, meaning this system is not public.

3.3 Implementation

Implementation is the result of the design of several elements that are intentionally separated to produce a clear logical picture of the system that aims to be completed and put back together to be implemented in the form of a complete application.

This section will explain the implementation of the results of system development in the form of an internship process application which consists of several functions including a login function, internship data, daily reports, report forms, student internship attendance and projects that may be carried out at the internship site.

Figure 5: Form Login.

Fig. 5, is a page on the application that is provided so that interested users, namely students, companies where internships and the academic section or study programs originate from internship students can use this system at the beginning of the internship, during the internship process and at the end of the internship process.

Like most application systems for security, a password is used when logging in because the password is a secret word that is used to identify who will use and be allowed (Bentley, Lonnie D. and Whitten Jeffrey L., 2007). Moreover, the application system carries multi-user users like this application.

Figure 6: Homepage Admin.

Fig. 6, is part of the system that functions as a workplace for the admin of the academic section or study program from the internship student. The display is made as simple as possible the same as the front view of the other functions of this application, so that users feel how easy it is to use the application interface so that it is hoped that it will be easy to understand by users and not confusing.

Figure 7: Screenshot of internship company.

Fig. 7. is one of the data processing functions that combines company data, student internships, length of internship, entry date, internship end date, supervisor and status.

Fig. 8, users from the company after logging in can see the data of students who input data to be able to do an internship at the company and can agree or not.

Figure 8: Approval Form.

3.4 Test

Testing using the blackbox method is carried out to find out whether the website is functioning properly and can be implemented or not.

Testing on this application is divided into 2 parts, namely the login section and the menu contained in the application.

Table 1: Login Test.

No.	Description	Expected Results (scenario)	The Final Result
1.	Login For Admin	Can login with username and password	success
2.	Login for Student	Can login with username and password	success
3.	Login For Company	Can login with username and password	success
4.	Login for Lectur	Can login with username and password	success

Testing is carried out when the application follows a problem-solving technique by conducting tests on small components and will eventually integrate it back into a complete and integrated system and carry out retesting.

The summary of the test can be seen in table 1 and table 2 with the following explanation:

Table. 1, the tests carried out on the application system of the apprenticeship process ultimately showed that the response from the application when logging in showed success, meaning what was expected or the scenario in the application was running as expected.

Table. 2, testing on the menu section for the process of filling in data, looking at the menu for internships, students, daily reports, report forms, internship absences, projects, lecturer and company data successfully according to the scenario.

This shows that the application that was built can be used based on testing using the black box method because in the end everything that was tested was successful.

After doing black box testing, it is continued with performance testing to determine the ability of the application from the user side.

This test uses performance as a functional model with the aim of testing the functional software.

Table 2: Pengujian Menu.

No.	Description	Expected results (scenario)	The Final Result
1	Access URL Address	Can see the main page	success
2.	Homepage	Can see the appearance and content of the home page	success
3.	Internship page	Can see the appearance and contents of the internship page, and can input data	success
4.	Student Page	Can see the appearance and contents of student pages, and can input data	success
5.	Daily Report Page	Can see the appearance and contents of the daily report page, and can input data	success
6.	Report Form Page	Can see the appearance and contents of the daily report page, and can input data	success
7.	Internship Absence Pages	Can see the appearance and contents of the internship absence page, and can input data	success
8.	Internship Project Page	Can see the appearance and contents of the internship project page, and can input data	success
9.	Lecturer Data Page	Can see the appearance and contents of the lecturer data page, and can input data	success
10.	Company Page	Can see the appearance and contents of company pages, and can input data	success

This respondent test uses 7 questions that are in accordance with the software model, namely easy to use, easy to find objects on the map, appropriate color composition, easy to read on billboards, easy to understand writing on billboards, easy to understand menus, easy to use menu buttons.

This test uses a non-random method by using a purposive sampling technique.

Respondents were 22 students with scenario students were given 10 minutes to try and then answer the questionnaire.

Respondents' requirements are those who meet the characteristics of the population, namely being able to use Windows applications, student status and have their own computer, either a laptop or a PC.

Ease of understanding the questions is also important, therefore the questionnaire was designed in a simple language. The measurement in this test uses a linker scale, namely by giving a number from 1 to 5.

Table 3: Pengujian Performance.

No	Question	Test result %				
		Strongly disagree	Do not agree	Doubtful	Agree	Strongly agree
1	Easy to use app	4,5		9,1	54,5	31,8
2	Easily search for tax objects on the map	4,5		9,1	54,5	31,8
3	Matching color composition			9,1	72,7	18,2
4	Easy-to-read writing on billboards		4,5		63,6	31,8
5	Easy to understand writing on billboards		4,5		68,2	27,3
6	Easy to understand menu	4,5		18,25	54,5	22,7
7	Easy-to-use menu button	4,5		4,5	68,5	22,72
	Average	4,5	4,5	10,06	62,3	26,6

The test results show that there is an average of 62.3% of respondents who answered agree and there are 2 percentages of the same answers, namely 4.5% strongly disagree and disagree. The average respondent answered 10.06% for undecided. The average value of the highest percentage is to answer agree that is 26.6%.

These results indicate that with a brief explanation of the application without prior training, the user can still use the visualization model easily even though there are still shortcomings in the application, namely it is still difficult to use, difficult to find tax objects on the map, menus are not easy to understand and menu buttons are not easy used.

These results indicate that there should be improvements to the model by increasing the performance of existing functions even though the effect of the test time which is only 10 minutes is given to the user to try out the application, it is felt that it affects the interaction between users and the application model so that it affects the performance of the developed model.

4 CONCLUSIONS

Research shows that the application design of the apprenticeship process can be implemented well with procedures using the waterfall method so that it is continued with testing using the black box method by being divided into 2 testing sections, namely the login and menu sections. In testing the login section there are 4 login scenarios and all of them are successful. While in the menu section there are 10 test scenarios with the results all in accordance with the test scenario or success.

The results of this study should also be continued with various tests such as white box, performance, effectiveness and efficiency of the application so that the results of this application are more complete.

Without adequate training on the model, users can still use this visualization model well as evidenced by the results of performance testing from 22 respondents, an average of 62.3% agree and 26.6% answered strongly agree.

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