

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Analysis

Is the activity of finding or identifying problems, evaluating, modeling and making system specifications with the aim of designing new systems or correcting deficiencies of existing systems.

4.1.1. Running System Analysis

Analysis of the ongoing system as a whole is very necessary for the author to be able to find out the weaknesses of the system, both from the way the system works and the implementers and everything involved in the system. For the creation of a new information system must be more programmed and structured.

The problem experienced is when a class has empty hours because the subject lecturer is unable to attend, then the class does not receive learning. From there it will cause various other problems, for example when a class that experiences empty hours will lag behind in material when compared to other classes. The next problem is lecturers with textbooks used as reference materials in the process of teaching and learning activities in the classroom. Likewise with the provision of course materials and assignments that students will read and study, with relatively little time so they are slow to understand. With this method of learning, there are still many shortcomings faced by students, for example, if a lecturer is unable to attend due to illness or other needs so that he cannot teach as usual, it is rare for a lecturer to immediately replace his position to teach. Likewise, if students are sick or have other needs so they cannot attend classes. In this case the use of e-learning will be very helpful in the teaching and learning process, even being able to solve problems that occur at the University of Trunojoyo Madura. The solution to this problem is to use a website-based e-learning information system that will function as an online learning media for each class and overcome the problem

of free hours. This website-based e-learning information system will be developed using PHP and MySQL.

Based on the explanation of the problems above, an E-Learning Information System design was created to help the process of teaching and learning activities at Trunojoyo University become more optimal and make it easier for the administration to manage data.

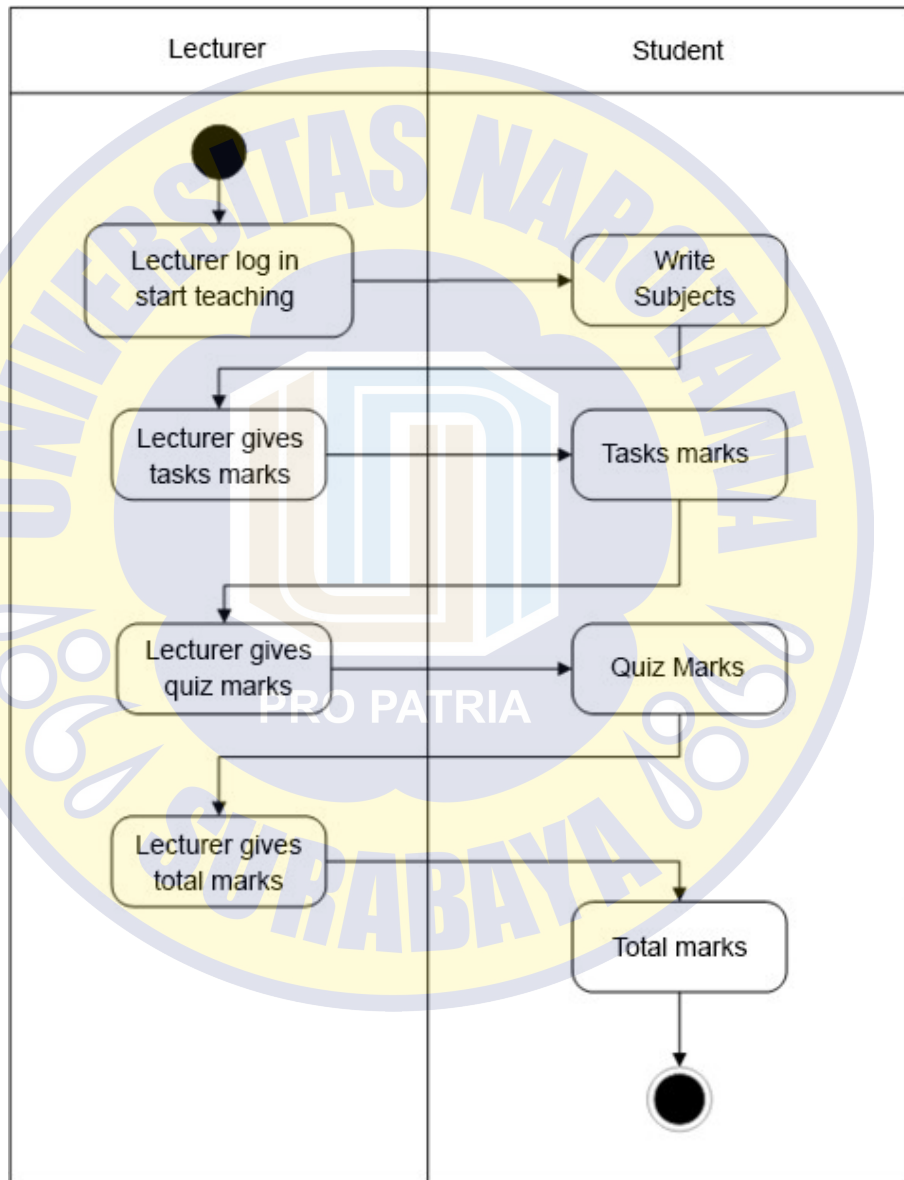


Figure 4.1 Running Analysis System

4.1.2. Proposed System Analysis

In this system several things are proposed that become the boundaries of the problem that will be given solutions or alternatives with the intention of explaining the requirements that must be met by the system to be designed, based on the results of the analysis, a requirement is made in the design. Using the programming language PHP and MySQL as data storage media (database).

After analysing the problems, Trunojoyo University needed a system that could assist in processing E-Learning activities at Trunojoyo University. Based on the things mentioned above, it is necessary to design a web-based E-Learning system at Trunojoyo University with computerized system, which is expected to be able to increase the efficiency and effectiveness of student attendance reporting activities.

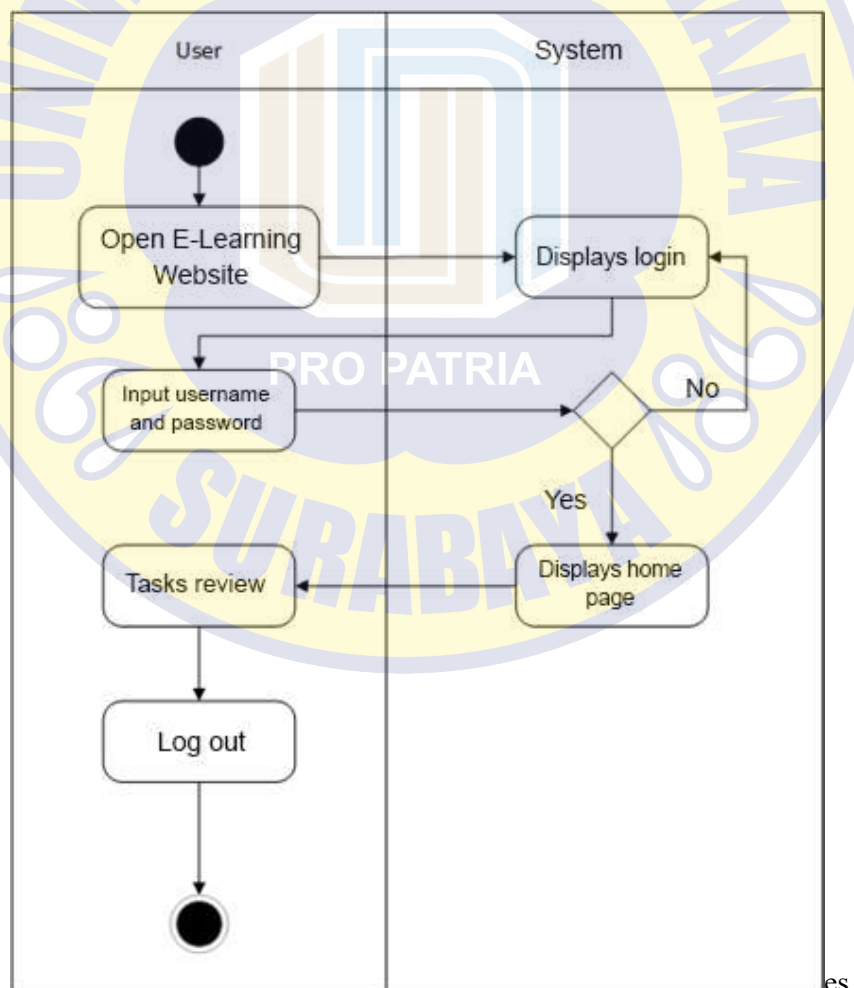


Figure 4.2 Analysis of the Proposed System

4.2 Unified Modeling Language (UML) Design

The Unified Modeling Language (UML) is a general-purpose, developmental, modeling language in the field of software engineering, intended to provide a standardized way of visualizing system designs. According to Nugroho (2010:6), UML (Unified Modeling Language) is a modeling language for systems or software with an object-oriented paradigm. Modeling is actually used to simplify complex problems in such a way that they are easier to learn and understand.

Table 4.1 UML Diagram Types

Diagram	Model
<i>Use Case</i>	How Users Interact with A System.
<i>Activity</i>	Procedural and Parallel Behavior.
<i>Sequence</i>	Interaction between objects.
<i>Class</i>	Classes, features and their relationships.

4.2.1. Use Case Diagram

Use Case is a very functional model in a system that uses actors and the use case itself. While the use case itself is a service or function available on the system for its use.

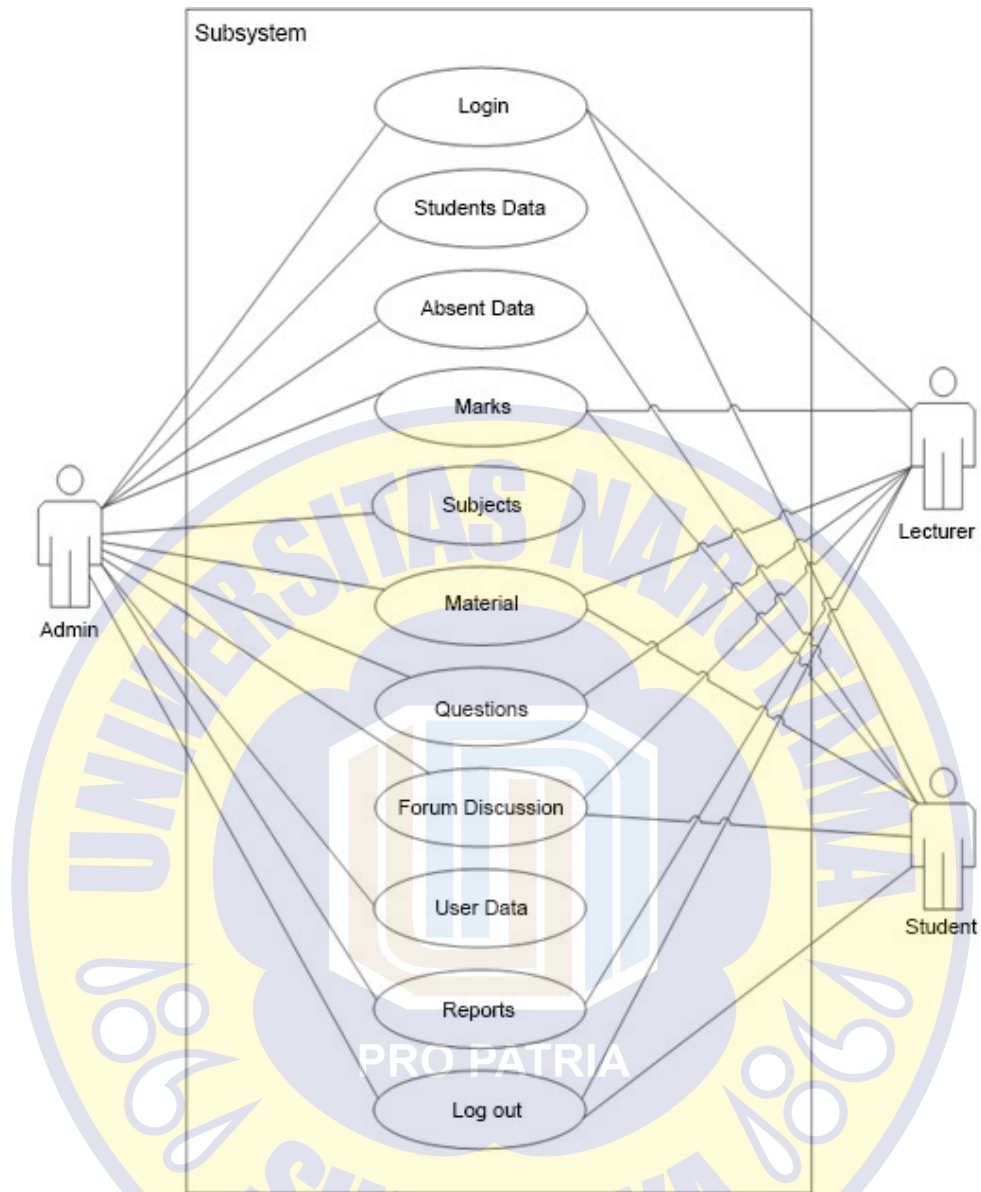


Figure 4.3 Use Case Diagram

4.2.2. Activity Diagram

Activity Diagram is something that describes the various flow of activities in the system that is being designed, how each flow begins, decisions that may occur and how the system ends.

1. Login Activity Diagrams

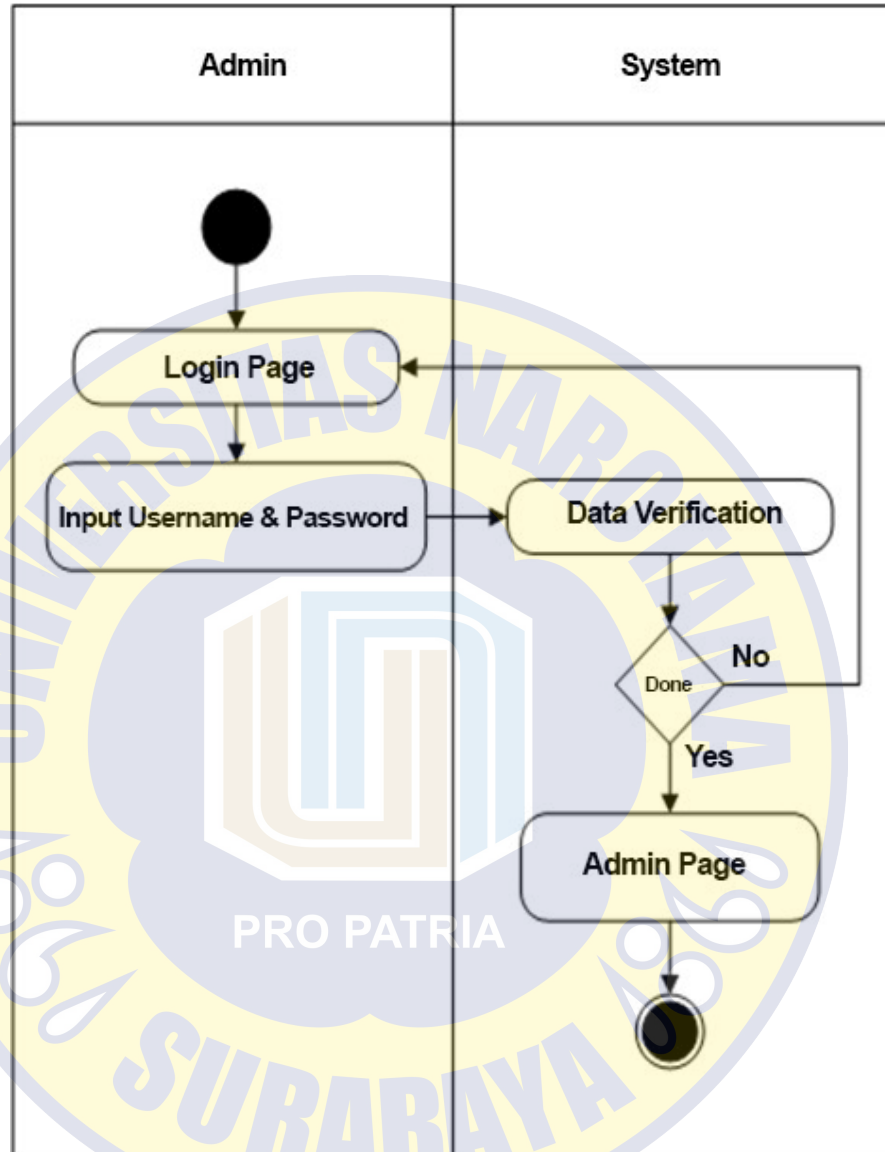


Figure 4.4 Activity Diagram Login

From the login activity diagram image above, the admin can input username and password in the login form, the system validates the data that has been input. When successful the admin will go to the intended page, if not successful, the admin will return to the login page

2. Student Data Activity Diagram

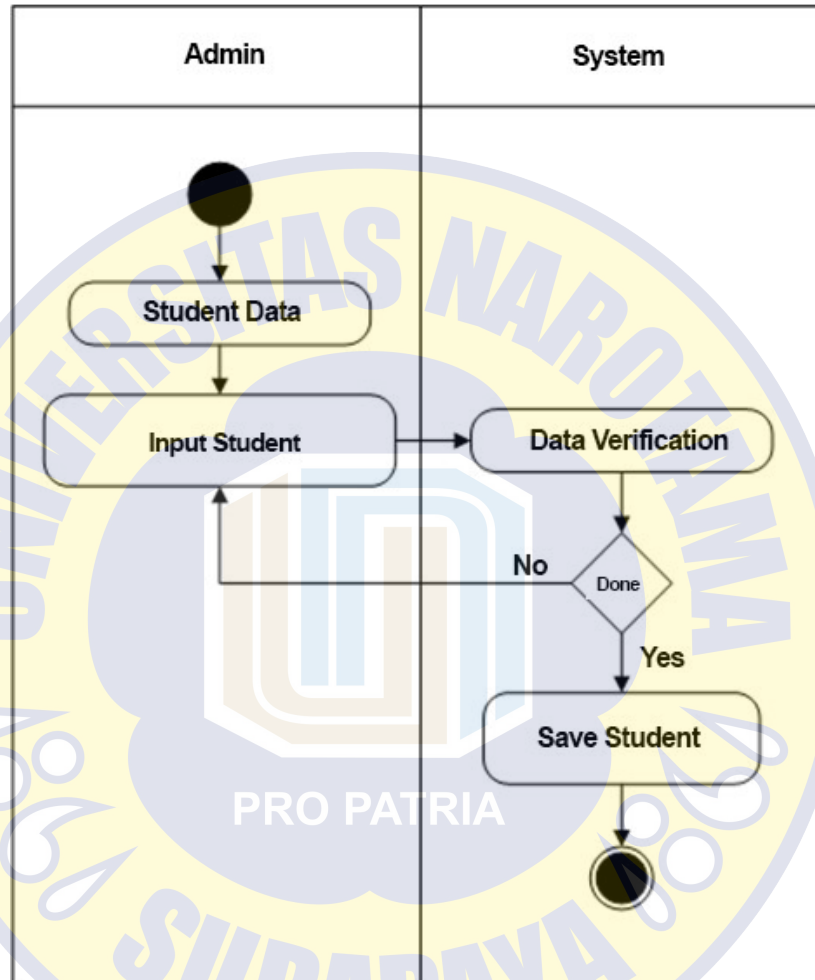


Figure 4.5 Student Data Activity Diagram

From the image of the student data activity diagram above, the admin inputs student data in the Student Data form, the system validates the data that has been input. When successful the admin will go to the Student Data data page, if not successful, the admin will return to the Student Data input page.

3. Activity Diagram Attendance

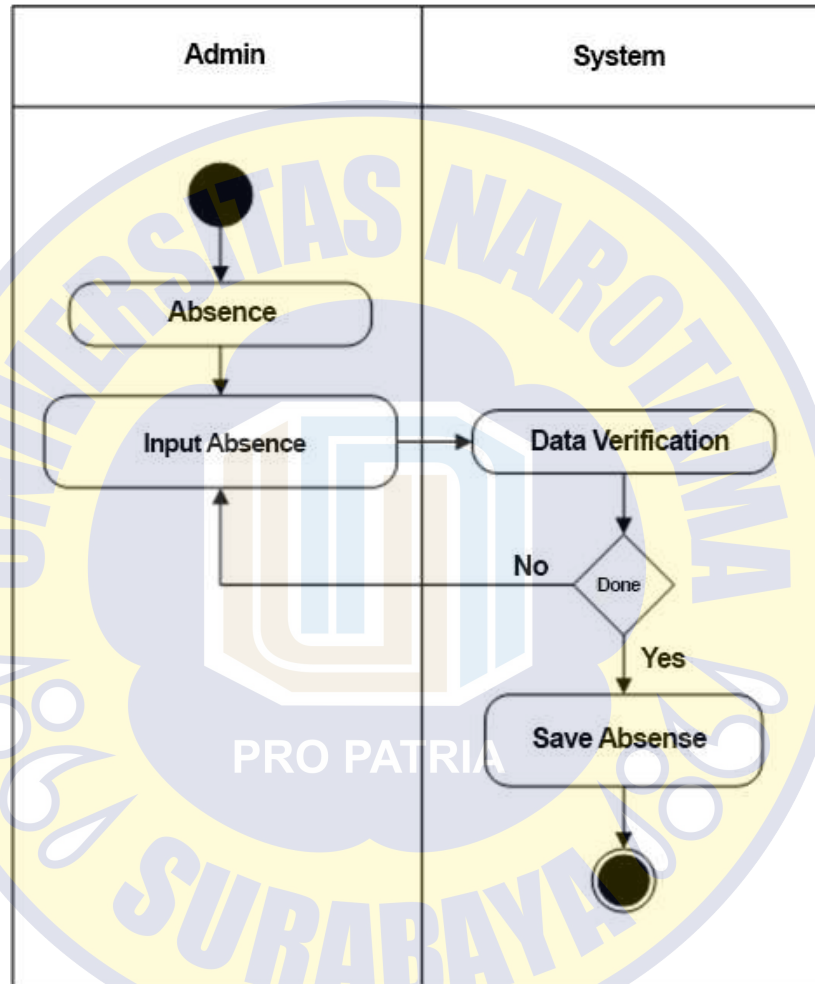


Figure 4.6 Activity Absenteeism Diagram

From the activity diagram the Attendance diagram above is that the admin inputs the Attendance in the Attendance form, the system validates the data that has been input. When successful, the admin will go to the Attendance data page, if it doesn't work, then the admin will return to the Attendance input page

4. Activity Value Data Charts

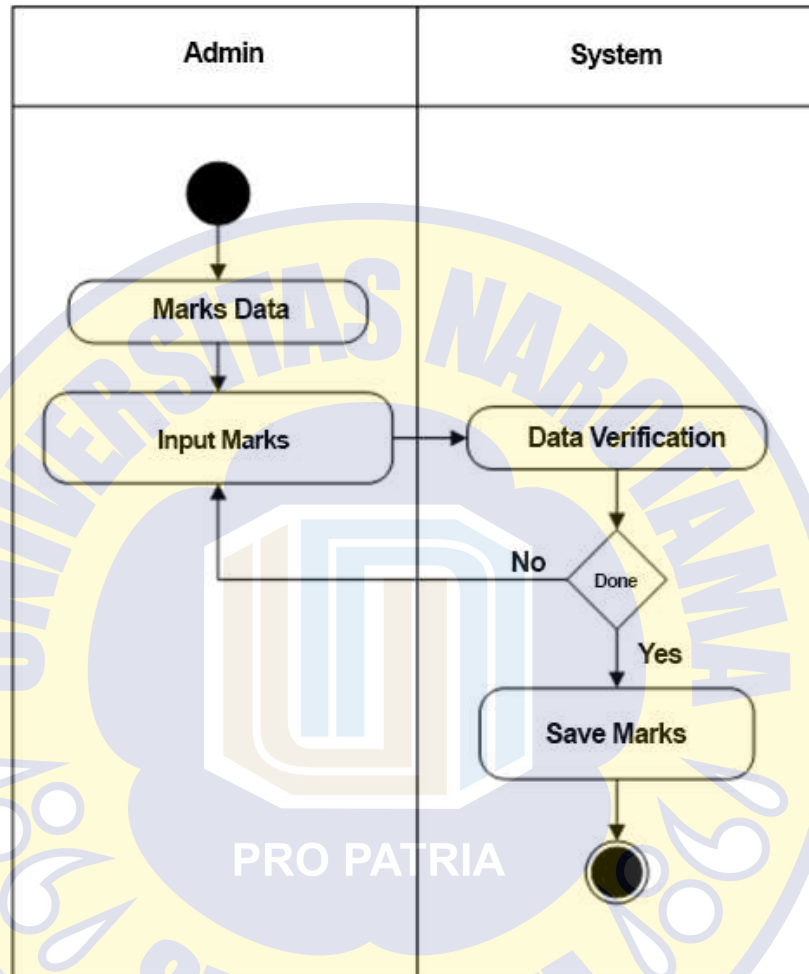


Figure 4.7 Activity Value Diagram

From the value activity diagram above, the admin inputs the Value in the Value form, the system validates the data that has been input. When successful, the admin will go to the Value data page, if it doesn't work, the admin will return to the Value input page.

5. *Activity Course Diagram*

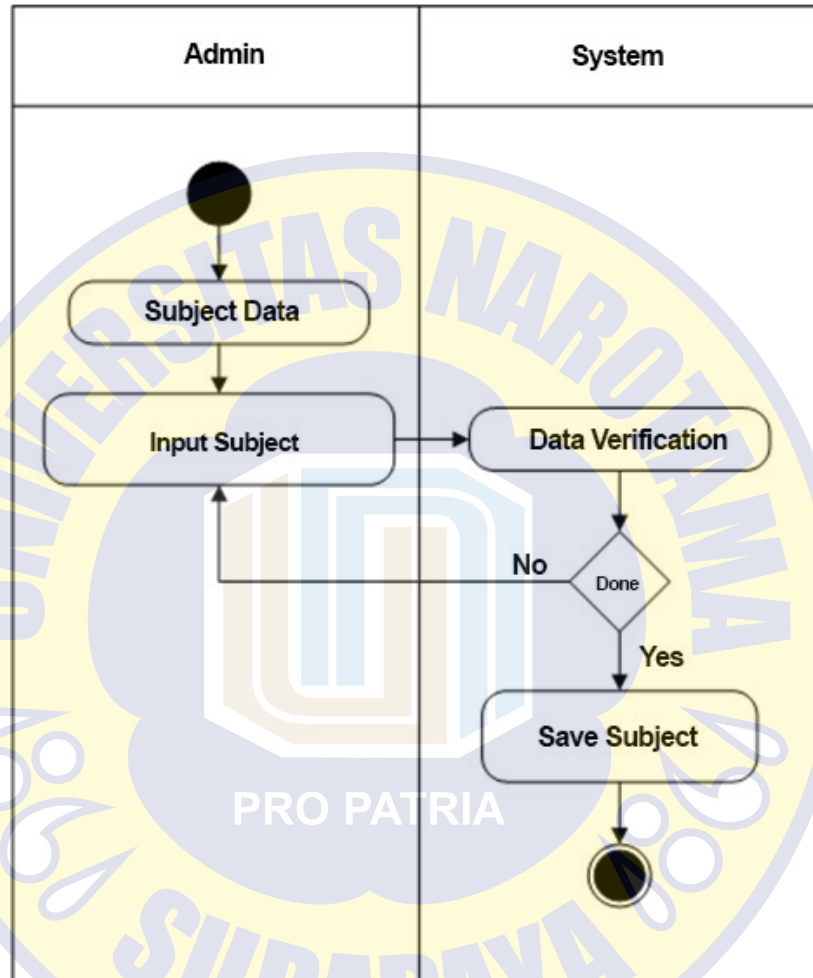


Figure 4.8 Course Activity Diagram

From the course activity diagram picture above, the admin inputs courses in the course form, the system validates the data that has been input. When successful, the admin will go to the course data page, if it doesn't work, the admin will return to the course input page

6. Activity Material Diagrams

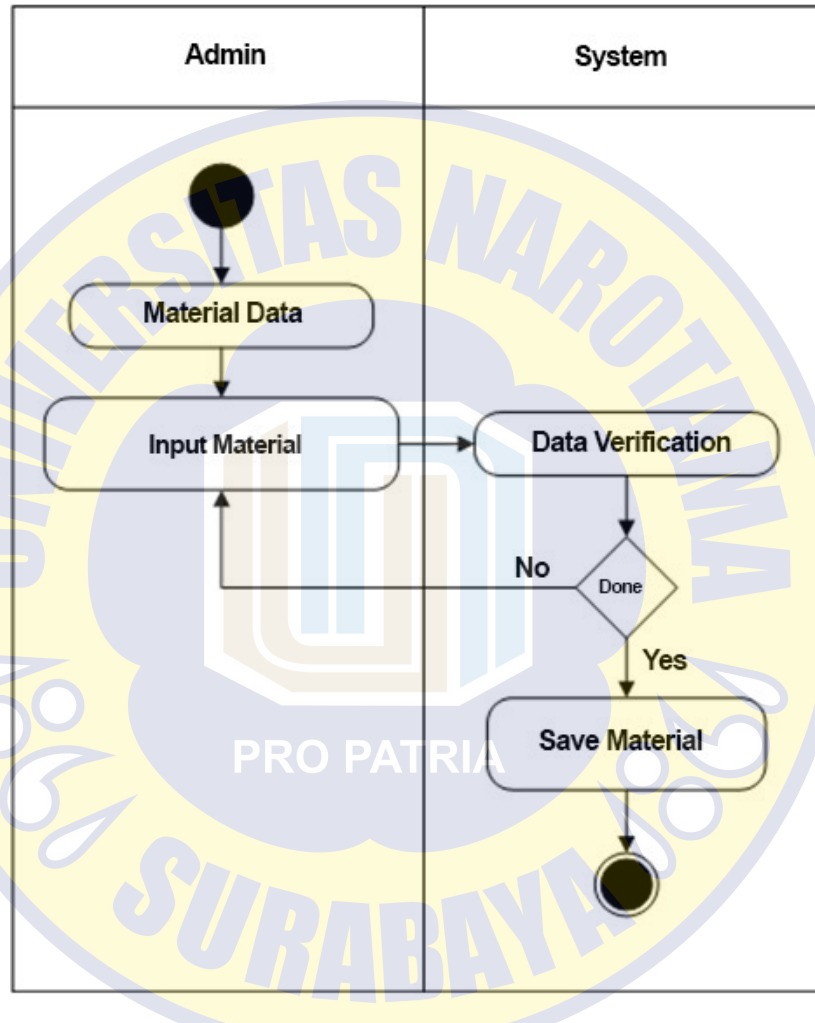


Figure 4.9 Material Activity Diagram

From the picture of the material activity diagram above, the admin inputs the material in the material form, the system validates the data that has been input. When successful the admin will go to the Material data page, if not successful, the admin will return to the Material input page

7. Activity Question Diagram

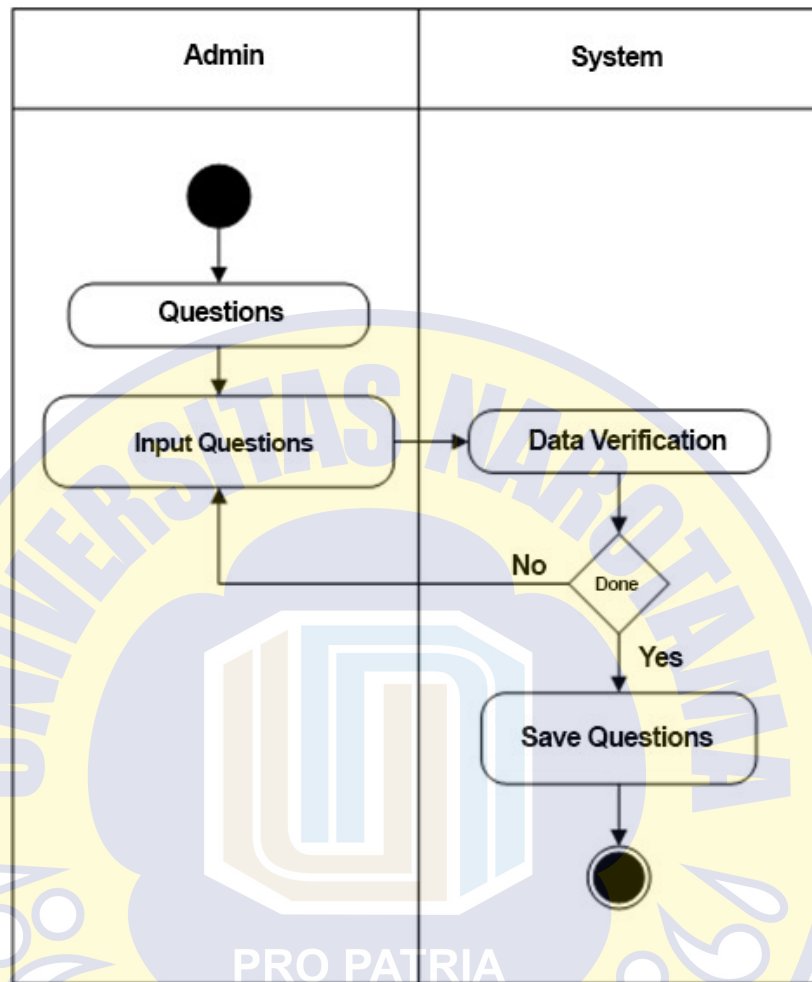


Figure 4.10 Activity Diagram Questions

From the question activity diagram image above, the admin inputs questions in the Question form, the system validates the data that has been input. When successful, the admin will go to the Question data page, if it doesn't work, the admin will return to the Question input page

8. Activity Discussion Forum Diagram

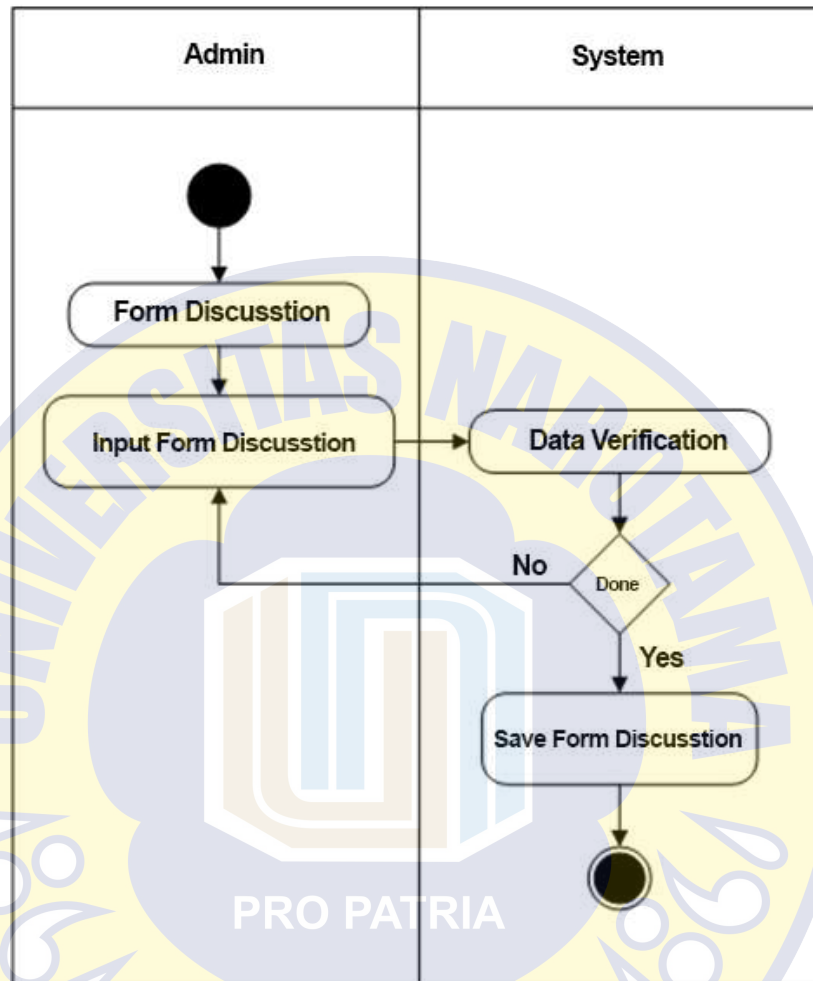


Figure 4.11 Activity Diagram of a Discussion Forum

From the discussion forum activity diagram picture above, the admin inputs the Discussion Forum in the Discussion Forum form, the system validates the data that has been input. When successful, the admin will go to the Discussion Forum data page, if it doesn't work, the admin will return to the Discussion Forum input page

9. Activity Report Chart

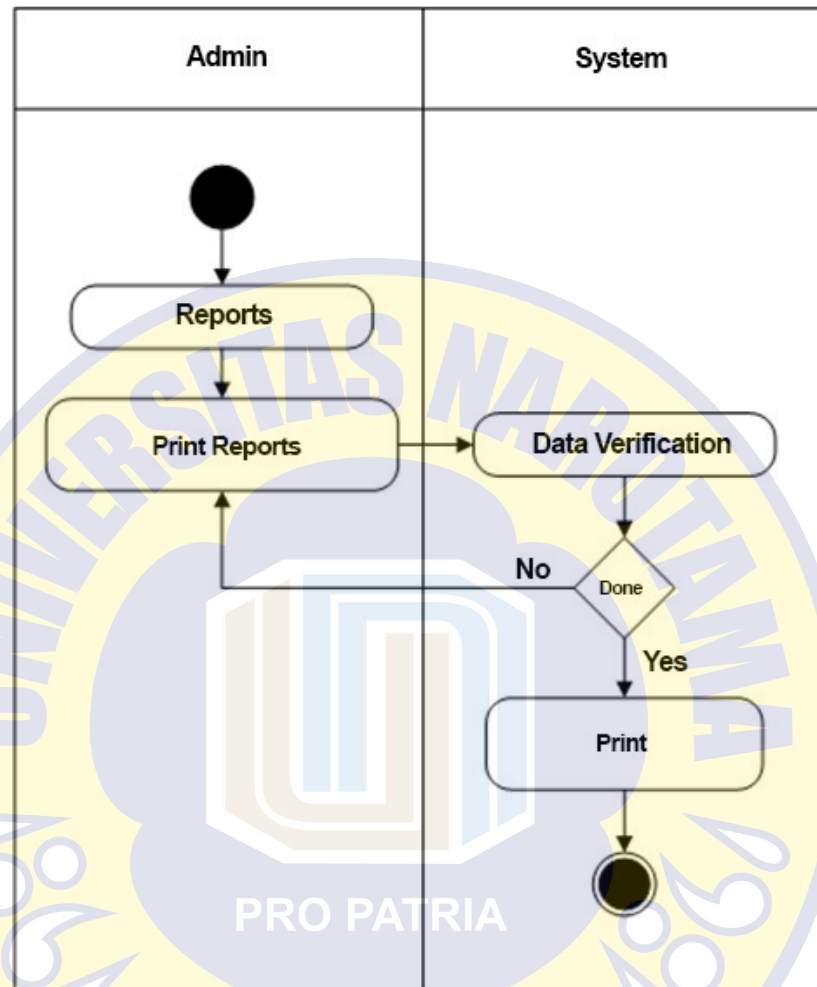


Figure 4.12 Activity Diagram Report

From the image of the report activity diagram above, the admin inputs reports in the report form, the system validates the data that has been input. When successful the admin will go to the Report data page, if not successful, the admin will return to the Report input page

10. Activity User Data Diagrams

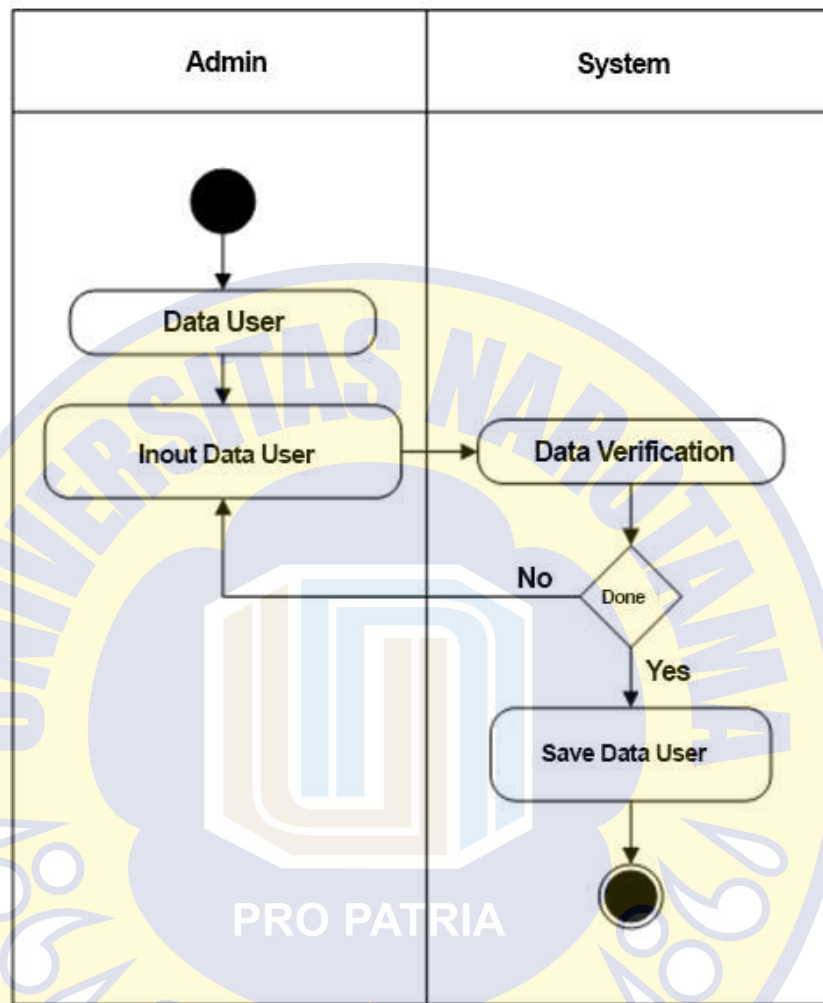


Figure 4.13 Activity Diagram Data User

From the image of the Data User activity diagram above, the admin inputs User Data in the Data User form, the system validates the data that has been input. When successful the admin will go to the Data User data page, if not successful, the admin will return to the User Data input page

11. Activity Logout Diagrams

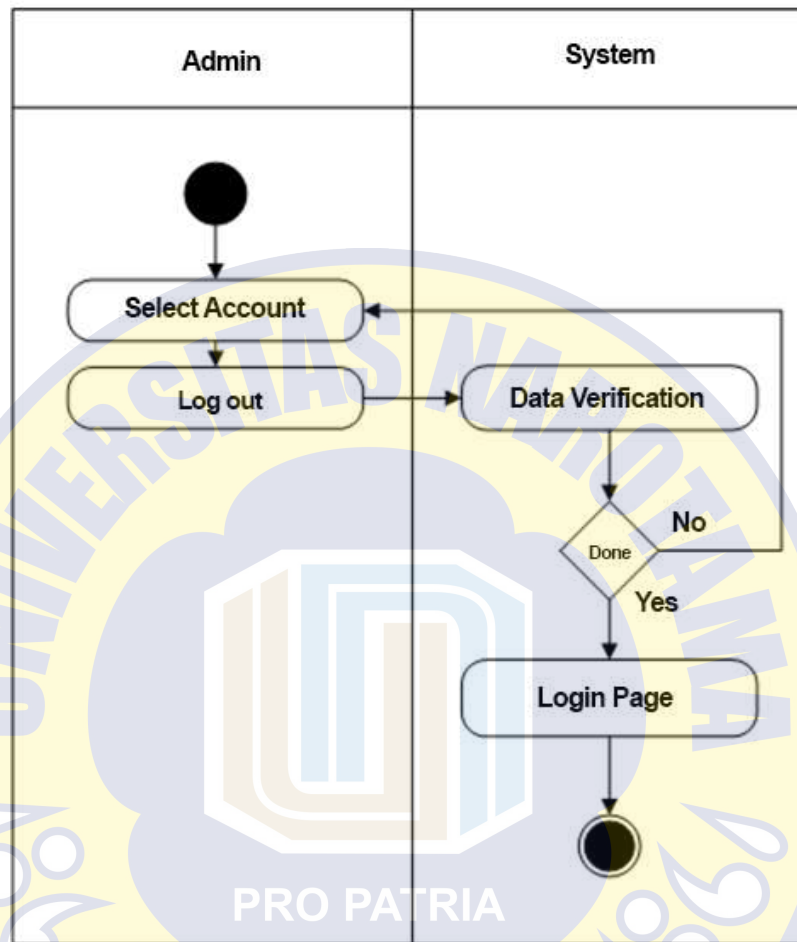


Figure 4.14 Activity Diagram Logout

From the logout activity diagram above, the admin logs out, the system validates the data that has been selected. When successful the admin will go to the login page, if not successful, the admin will return to the dashboard page

4.2.3. Sequence Diagram

Sequence Diagram is a sequence diagram that shows or displays the interactions between objects in the system arranged in a sequence or time series. The interaction between these objects includes users, displays and so on in the form of messages.

1. Sequence Diagram Login

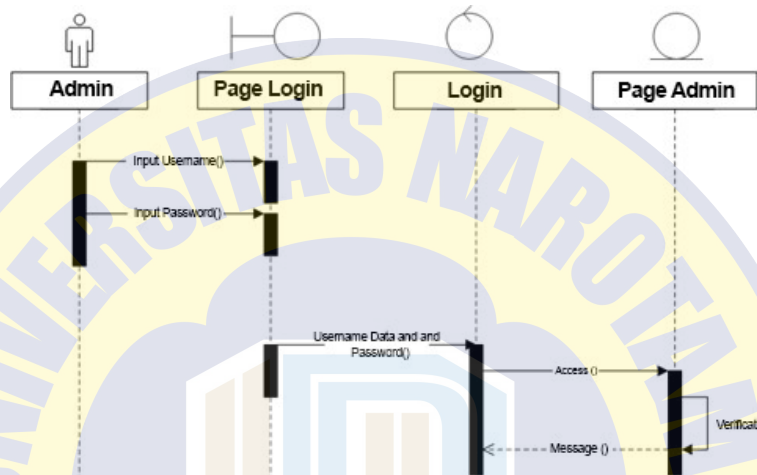


Figure 4.15 Sequence Diagram Login

From the login sequence diagram image above, the admin can input a username and password in the login form, the system validates the data that has been input. When successful the admin will go to the intended page, if not successful, the admin will return to the login page

2. Sequence Student Data Diagram

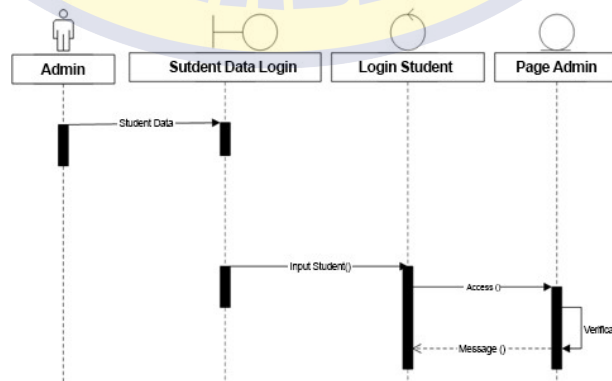


Figure 4.16 Sequence Diagram of Student Data

From the Student Data Sequence diagram above, the admin inputs Student Data in the Student Data form, the system validates the data that has been input. When successful, the admin will go to the Student Data page, if it doesn't work, the admin will return to the Student Data input page

3. Sequence Attendance Data Diagram

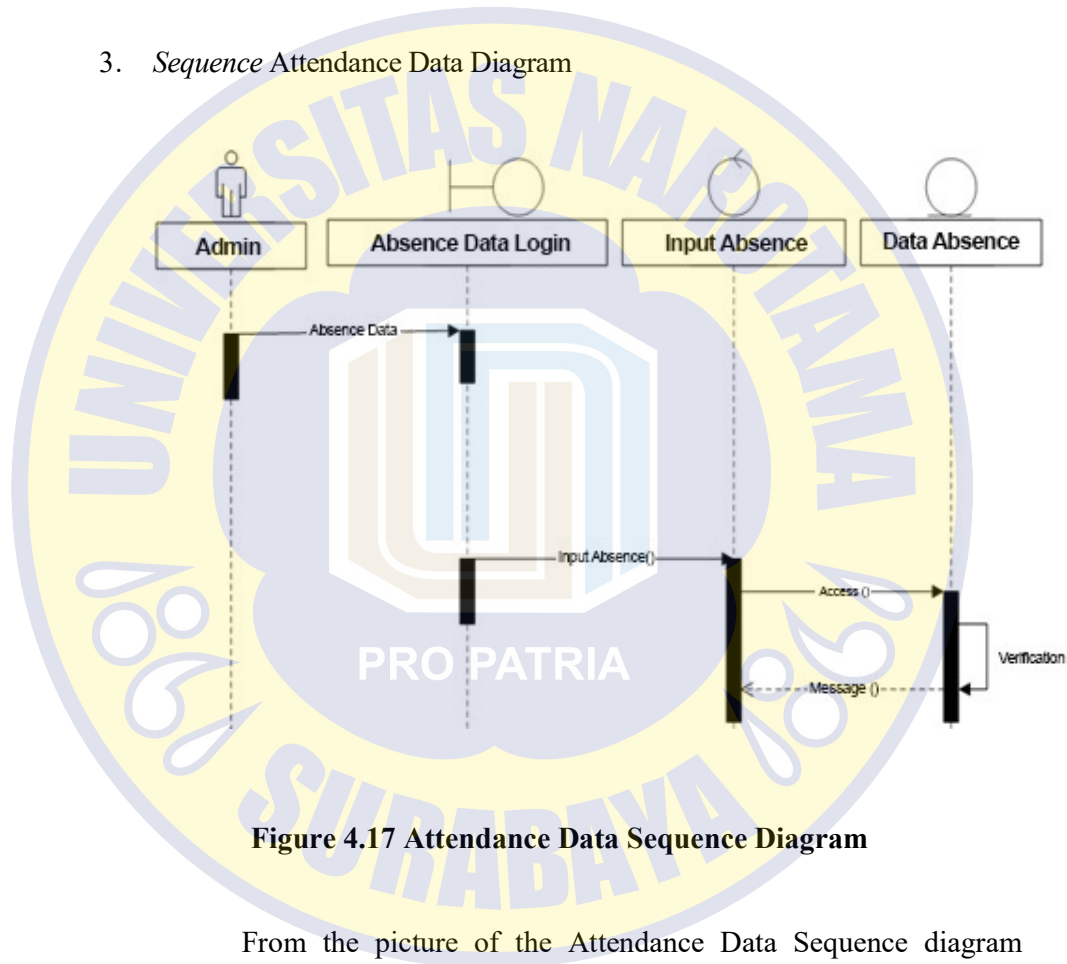


Figure 4.17 Attendance Data Sequence Diagram

From the picture of the Attendance Data Sequence diagram above, the admin inputs Attendance Data in the Attendance Data form, the system validates the data that has been input. When successful the admin will go to the Attendance Data page, if not successful, the admin will return to the Attendance Data input page

4. Sequence Value Diagram

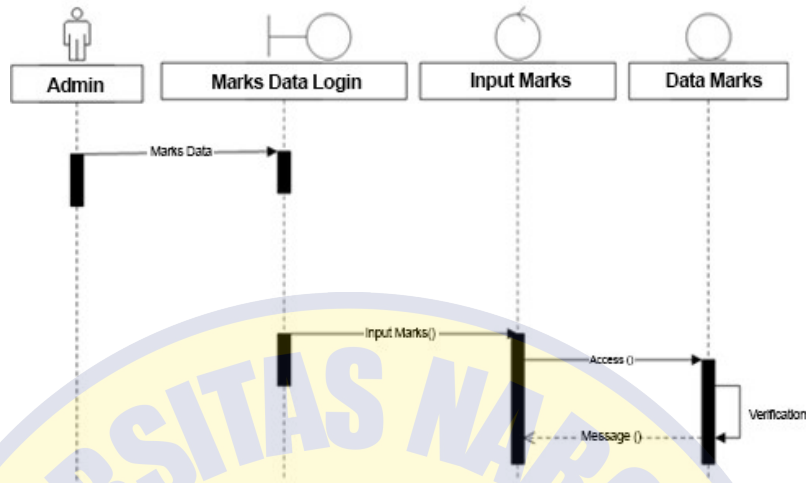


Figure 4.18 Sequence Diagram of Value Data

From the Value Data Sequence diagram above, the admin inputs Value Data in the Value Data form, the system validates the data that has been input. When successful, the admin will go to the Value Data page, if it doesn't work, the admin will return to the Value Data input page

5. Sequence Course Diagram

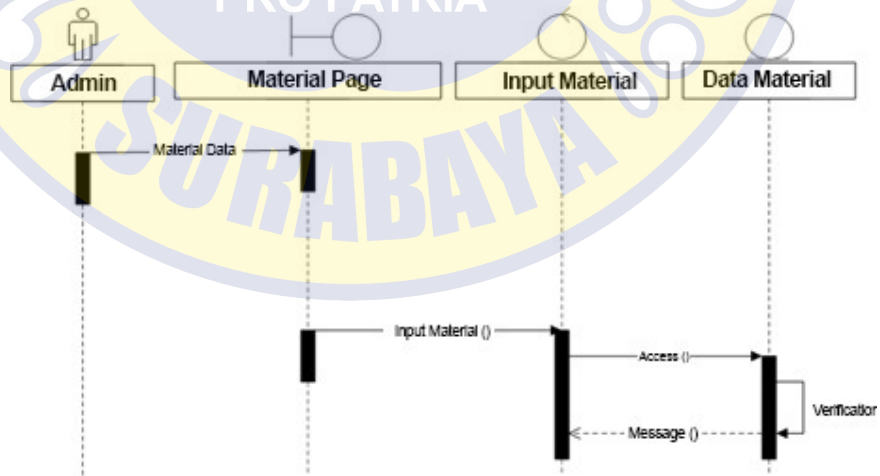


Figure 4.19 Sequence Diagram of Course Data

From the image Sequence diagram of the course data above, the admin inputs the course data in the course data form, the system validates the data that has been input. When successful, the admin will go to the Course Data page, if it doesn't work, then the admin will return to the Course Data input page

6. *Sequence Material Diagrams*

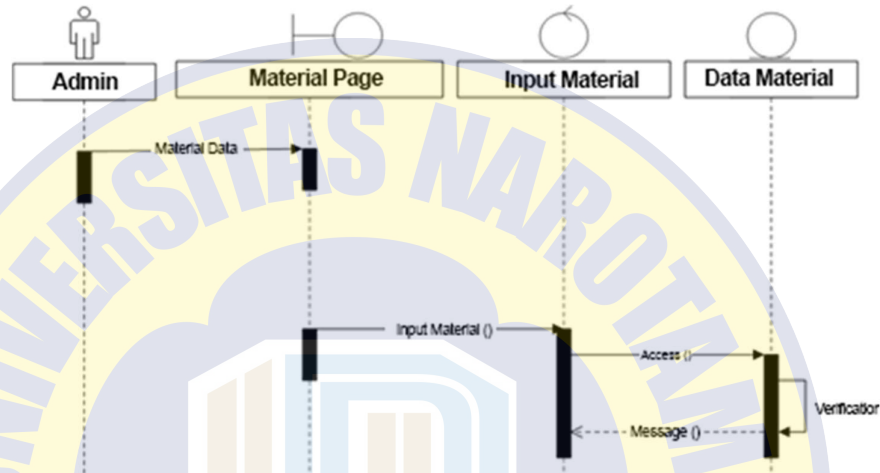


Figure 4.20 Sequence Diagram of Material Data

From the image of the Material Data Sequence diagram above, the admin inputs Material Data in the Material Data form, the system validates the data that has been input. When successful the admin will go to the Material Data page, if not successful, the admin will return to the Material Data input page

7. *Sequence Question Diagram*

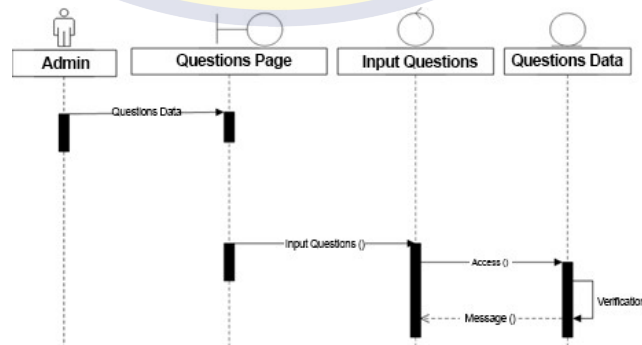


Figure 4.21 Question Data Sequence Diagram

From the Question Data Sequence diagram image above, the admin inputs Question Data in the Question Data form, the system validates the data that has been input. When successful the admin will go to the Question Data page, if not successful, the admin will return to the Question Data input page

8. *Sequence Discussion Forum Diagram*

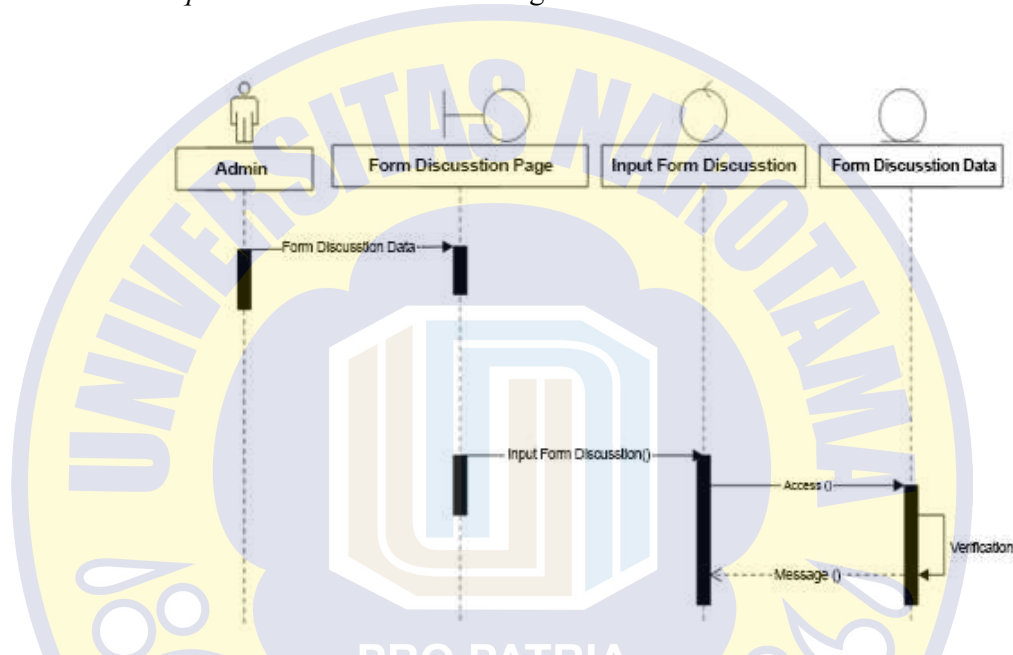


Figure 4.22 Sequence Diagram of Discussion Forum Data

From the Sequence diagram of the Discussion Forum Data above, the admin inputs the Discussion Forum Data in the Discussion Forum Data form, the system validates the data that has been input. When successful, the admin will go to the Discussion Forum Data page, if it doesn't work, the admin will return to the Discussion Forum Data input page

9. Sequence User Data Diagrams

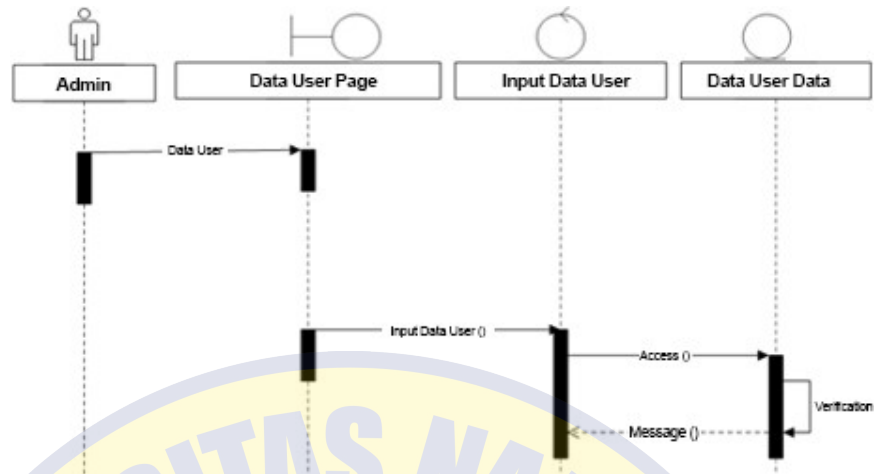


Figure 4.23 User Data Sequence Diagram

From the User Data Sequence diagram above, the admin inputs User Data in the User Data form, the system validates the data that has been input. When successful the admin will go to the Data User data page, if not successful, the admin will return to the User Data input page

10. Sequence Report Diagram

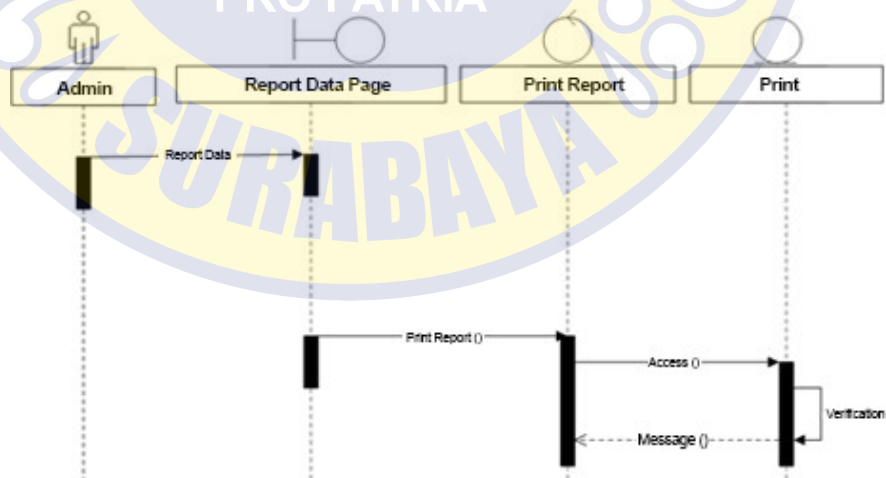


Figure 4.24 Report Data Sequence Diagram

From the image Sequence diagram of the Report Data above, the admin prints the report on the Report form, the system validates the data that has been input. When successful, the admin will go to the Report data page, if it doesn't work, the admin will return to the Report print page

11. *Sequence Diagram Logout*

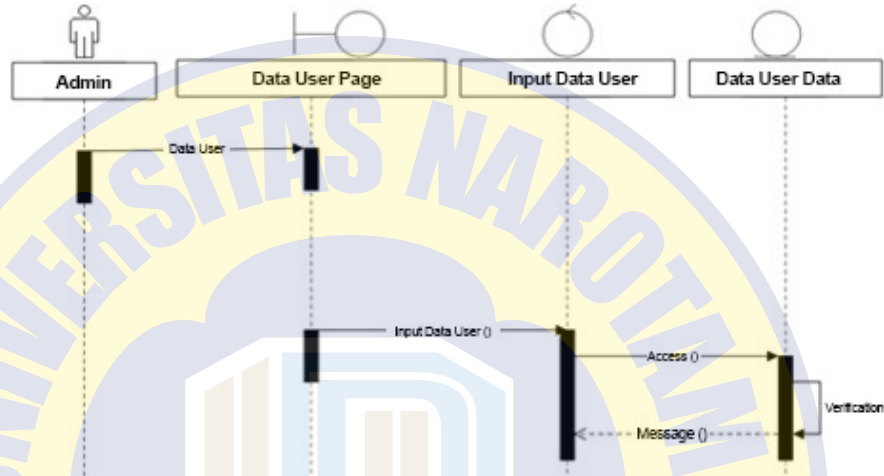


Figure 4.25 Logout Sequence Diagram

From the logout sequence diagram image above, the admin logs out, the system validates the data that has been selected. When successful the admin will go to the login page, if not successful, the admin will return to the dashboard page

4.3 Design Implementation

System implementation is the stage where the system is ready to operate in the actual state, so that it will be known that the system is ready to produce the desired goal. Before the program is ready to be used and implemented, the program must be error free. Program errors that may occur include writing language errors, processing or logical errors. After the program is free from errors, the program is tested by entering data for processing.

4.3.1. Admin Design Implementation

In testing this application, the author tries to implement several screen designs displays where the design will be tested according to user requests to be used.

1. Dashboard Page Implementation

Dashboard is the initial page that contains menus for the web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the Dashboard page.

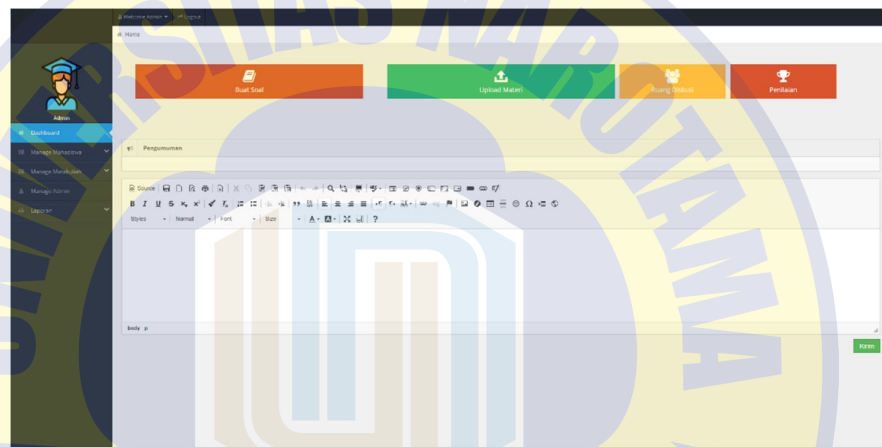


Figure 4.26 Dashboard Page Display

2. Implementation of Student Data Pages

Student data is a page that contains student data for a web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the student data page

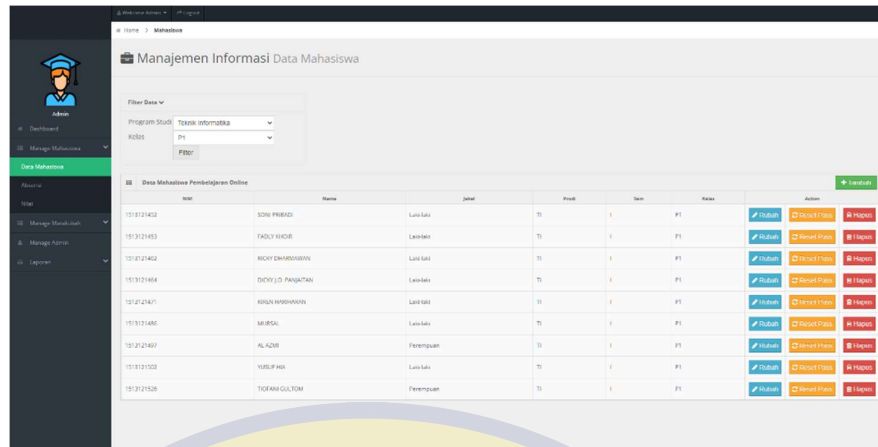


Figure 4.27 Display of Student Data Pages

3. Implementation of Attendance Data Pages

Attendance data is a page that contains attendance data for a web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the attendance data page



Figure 4.28 Attendance Data Page Display

4. Value Page Implementation

Value is a page that contains data on the value of a web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the value data page

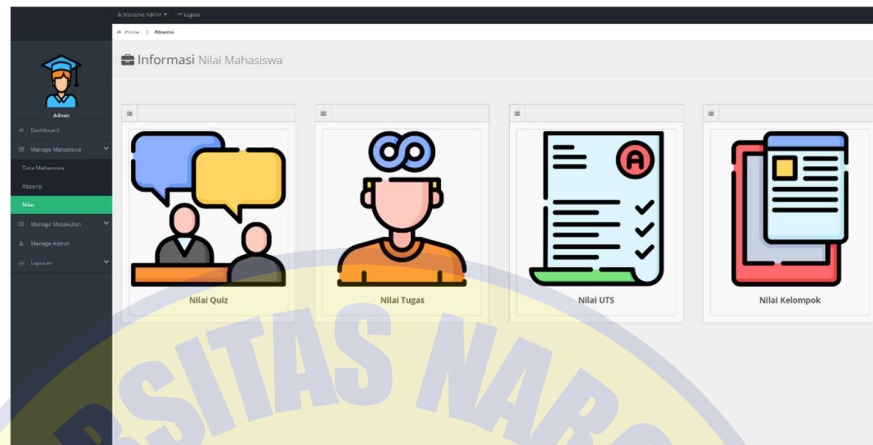


Figure 4.29 Display of Value Data Page

5. Implementation of Course Pages

The course is a page that contains data on web-based e-learning information system courses at Trunojoyo University. The following is the implementation of the interface on the course data page



Figure 4.30 Display of Course Pages

6. Material Page Implementation

The material is a page that contains material data for a web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the material data page

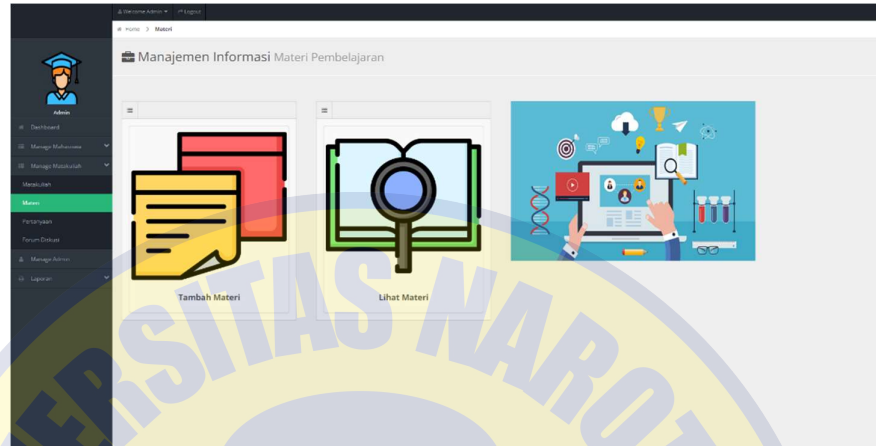


Figure 4.31 Material Page Display

7. Question Page Implementation

Question Data is a page that contains question data for a web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the question data page

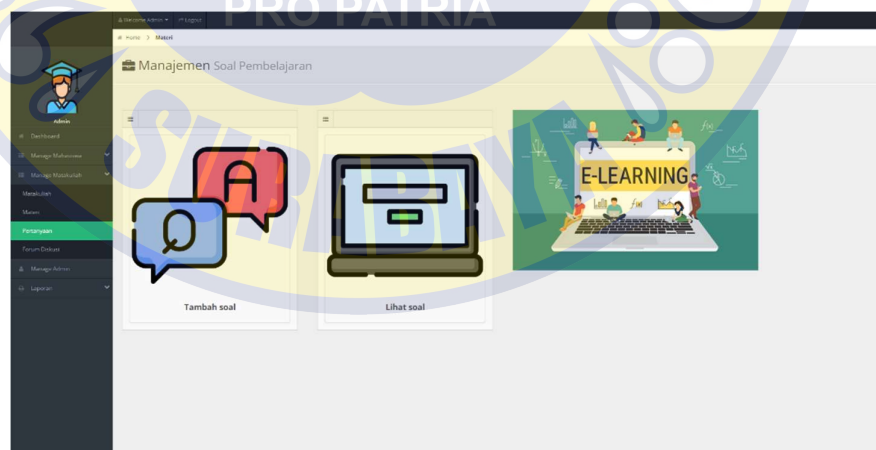


Figure 4.32 Question Page Display

8. Discussion Forum Page Implementation

Discussion Forum is a page that contains a discussion forum for web-based e-learning information systems at Trunojoyo University. The following is the implementation of the interface on the discussion forum page

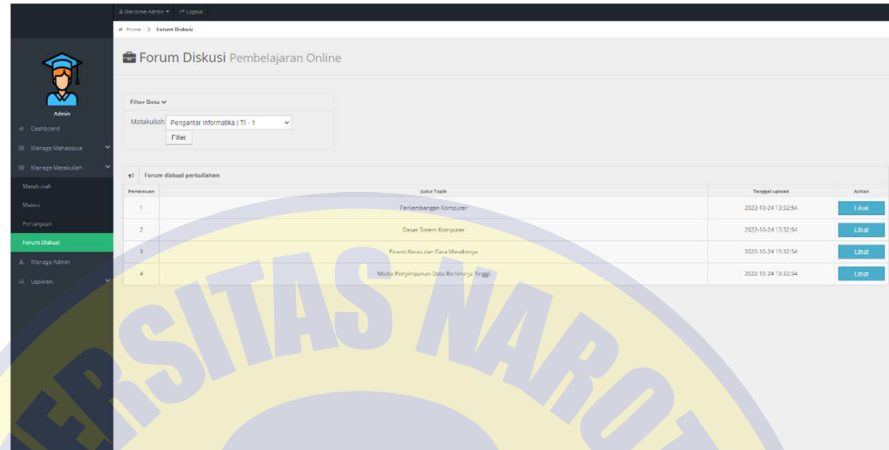


Figure 4.33 Display of the Discussion Forum Page

9. Figure 4.3 Display of the Discussion Forum Page

User data is a page that contains user data for a web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the user data page



Figure 4.34 Display of User Data Pages

10. Implementation of Student Report Pages

Student report is a page containing student report data of web-based e-learning information system at Trunojoyo University. The

following is the implementation of the interface on the student report data page

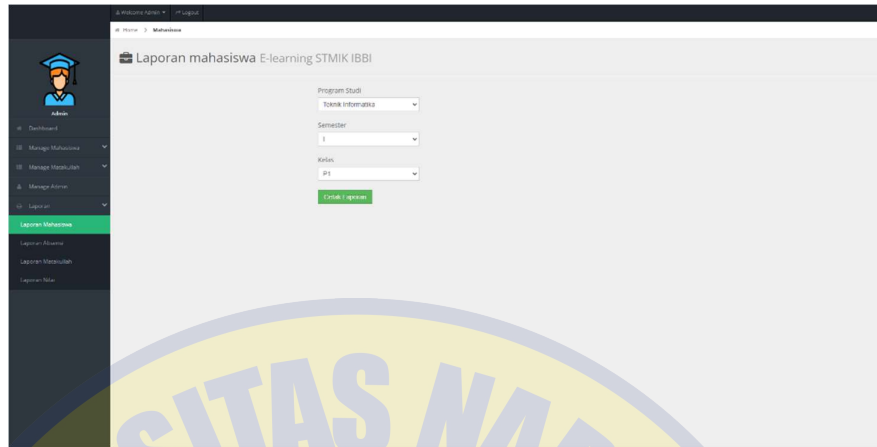


Figure 4.35 Display of Student Report Pages



Figure 4.36 Display of Student Report Print Pages

11. Implementation of Attendance Report Page

The attendance report is a page that contains attendance report data for a web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the attendance report data page

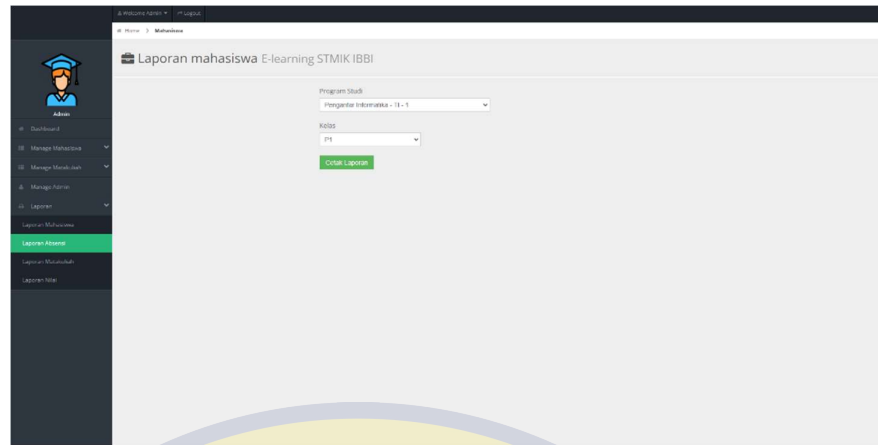


Figure 4.37 Display of the Attendance Report Page



Figure 4.38 Display of the Printed Attendance Report Page

12. Implementation of Course Report Pages

The course report is a page that contains data on the web-based e-learning information system course report at Trunojoyo University. The following is the implementation of the interface on the course report data page

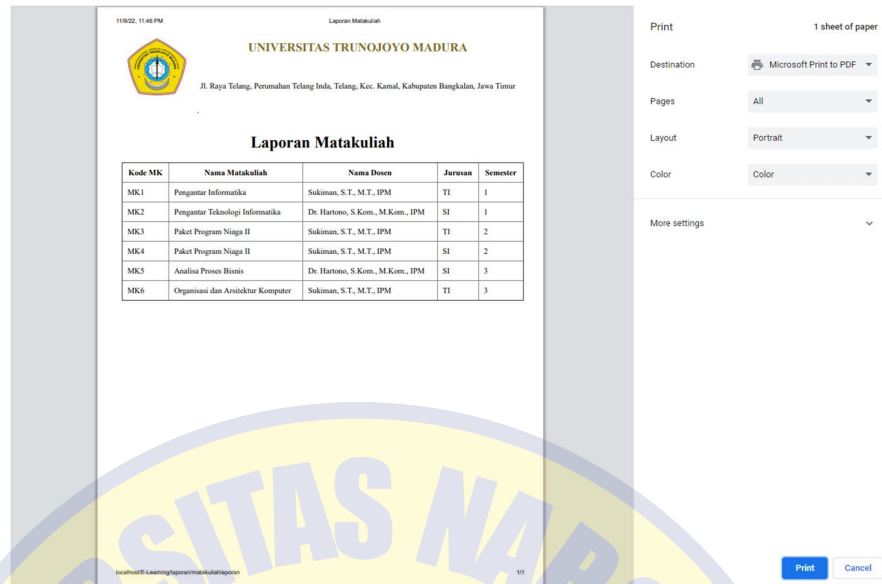


Figure 4.39 Display of Course Report Print Pages

13. Value Report Page Implementation

The grade report is a page that contains value report data for a web-based e-learning information system at Trunojoyo University. Following is the implementation of the interface on the value report data page

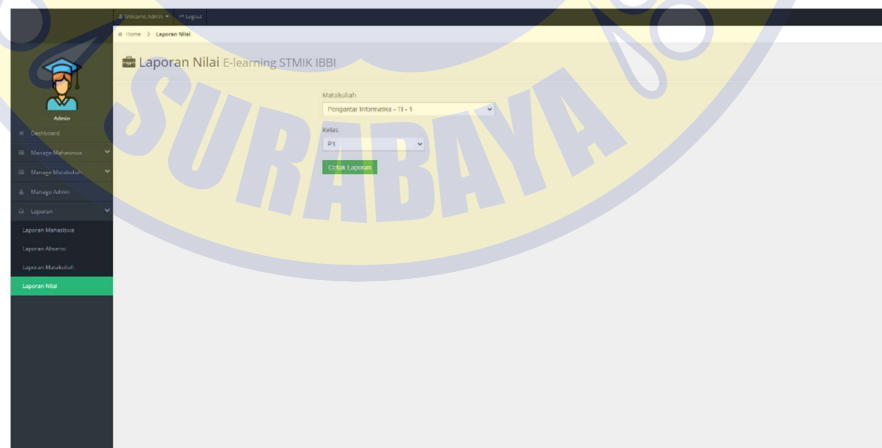


Figure 4.40 Value Report Page Display

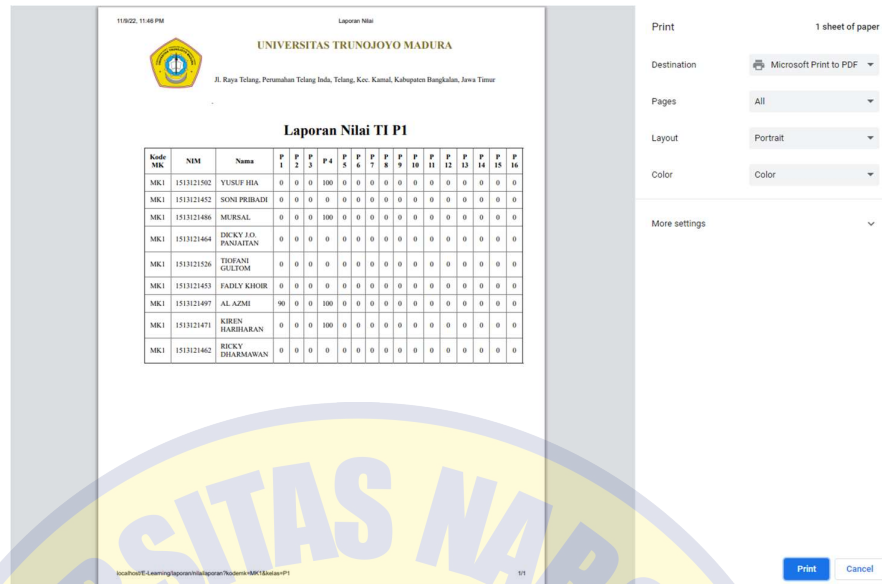


Figure 4.41 Printed Value Report Page Display

4.3.2. Lecturer Design Implementation

In testing this application, the author tries to implement several screen designs displays where the design will be tested according to the user's request to be used.

1. Dashboard Page Implementation

Dashboard is the initial page that contains menus for the web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the Dashboard page

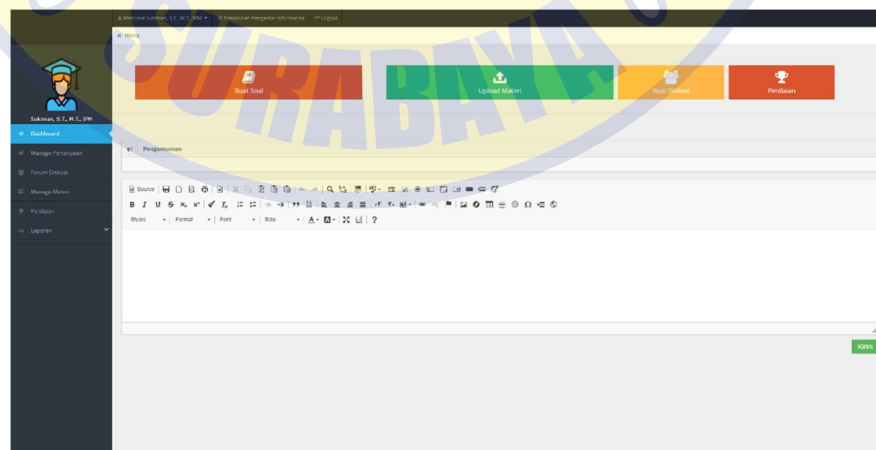


Figure 4.42 Dashboard Page Display

2. Implementation of Inquiry Pages

Question Data is a page that contains question data for a web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the question data page

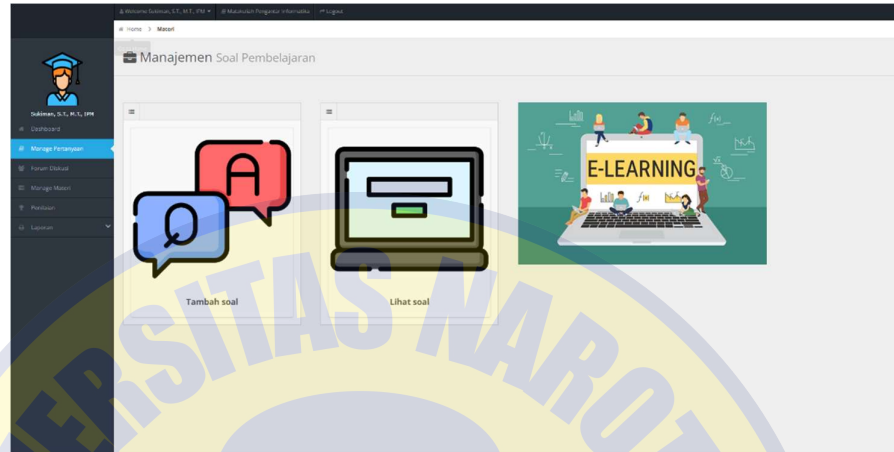


Figure 4.43 Question Page Display

3. Material Page Implementation

The material is a page that contains material data for a web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the material data page



Figure 4.44 Material Page Display

4. Assessment Page Implementation

Value is a page that contains data on the value of a web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the value data page



Figure 4.45 Rating Page Display

5. Implementation of Attendance Report Page

Attendance data is a page that contains attendance data for a web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the attendance data page

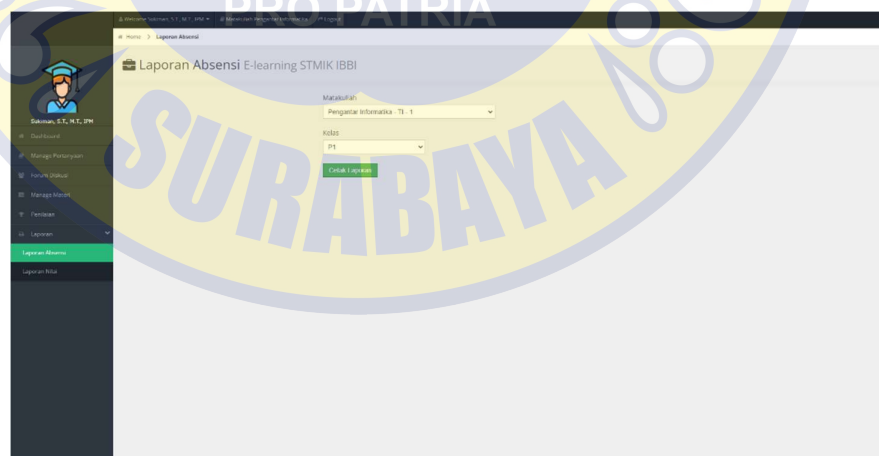


Figure 4.46 Display of the Attendance Report Page

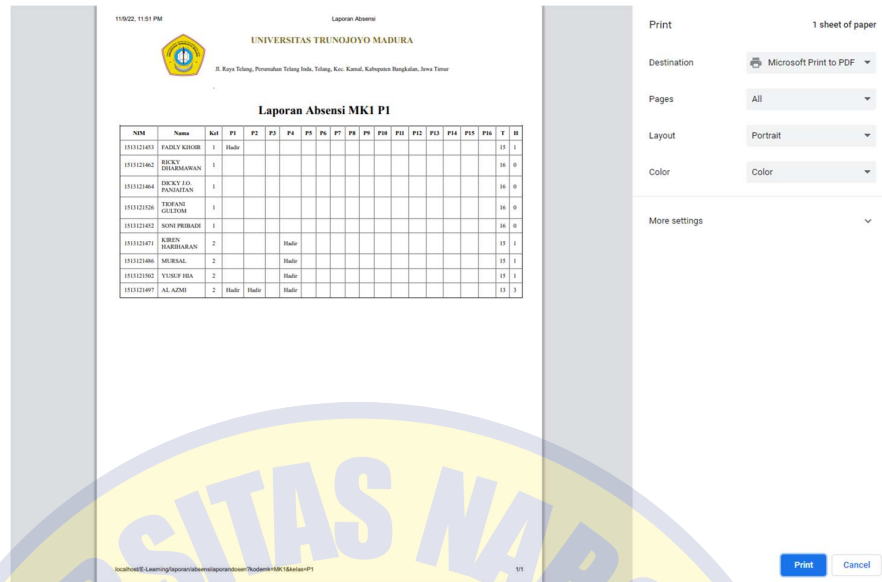


Figure 4.47 Display of the Attendance Report Print Page

6. Value Report Page Implementation

The grade report is a page that contains value report data for a web-based e-learning information system at Trunojoyo University. Following is the implementation of the interface on the value report data page



Figure 4.48 Value Report Page Display

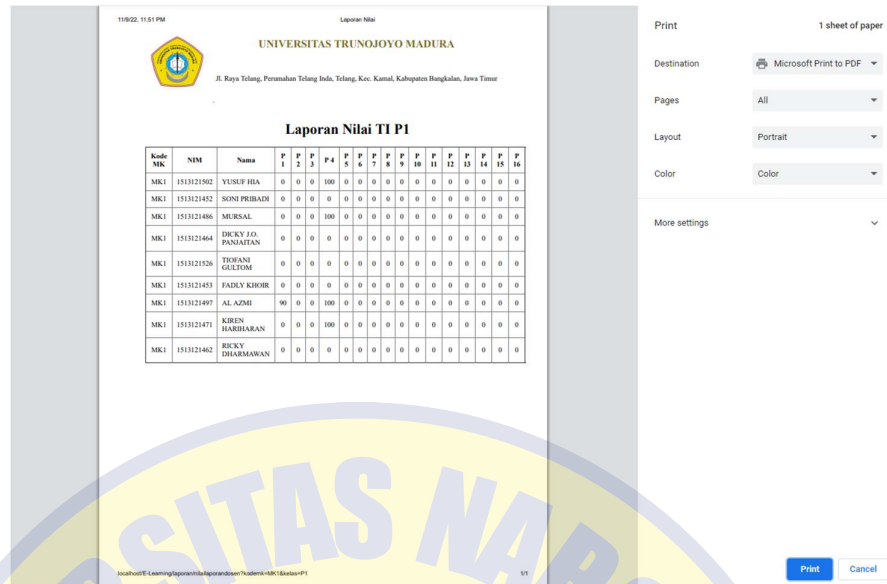


Figure 4.49 Value Report Print Page Display

4.2.4. Student Design Implementation

In testing this application the author tries to implement several screen design displays where the design will be tested according to user requests to be used

1. Dashboard Page Implementation

Dashboard is the initial page that contains menus for the web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the Dashboard page

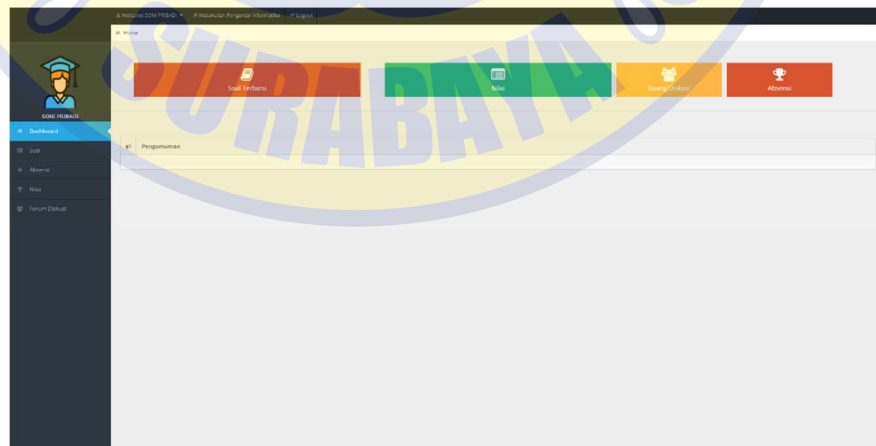


Figure 4.50 Dashboard Page Display

2. Problem Page Implementation

The question data is a page that contains questions about the web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the question data page

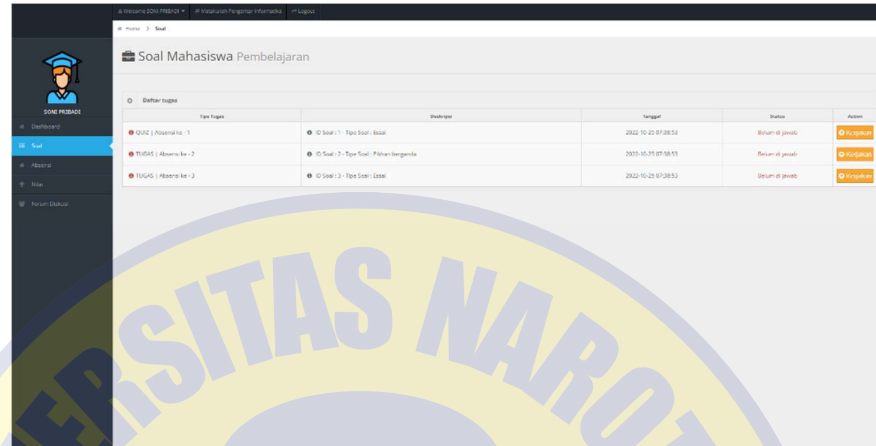


Figure 4.51 Question Page Display

3. Attendance Page Implementation

Attendance data is a page that contains attendance data for a web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the attendance data page

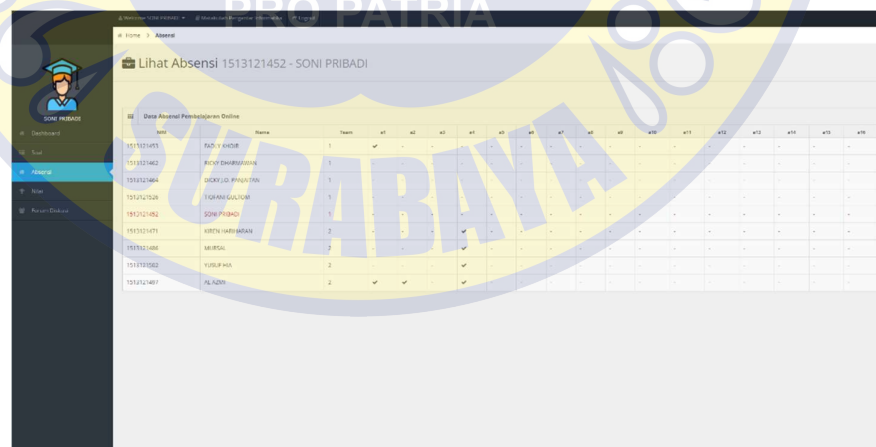


Figure 4.52 Attendance Page Display

4. Value Page Implementation

Value is a page that contains data on the value of a web-based e-learning information system at Trunojoyo University. The following is the implementation of the interface on the value data page

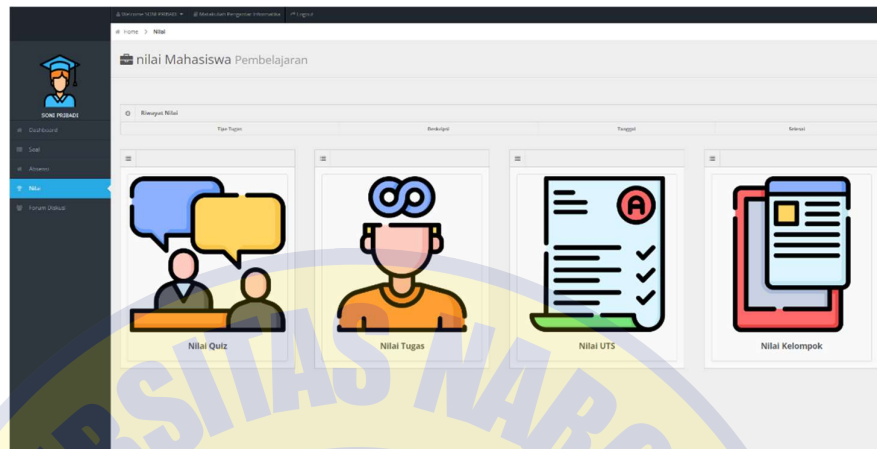


Figure 4.53 Value Page Display

5. Discussion Forum Page Implementation

Discussion Forum is a page that contains a discussion forum for web-based e-learning information systems at Trunojoyo University. The following is the implementation of the interface on the discussion forum page



Figure 4.54 Display of the Discussion Forum Page

4.4 Testing

Testing is an inseparable part of building a system. Because by testing the system to be implemented, it can be seen whether the system is running as desired or not. and intended so that the quality of the system can be guaranteed an implemented.

4.4.1. Black Box Testing

Black Box testing is software testing focusing on its functional requirements. Information System Testing uses test data in the form of Input data from Users on the system that has been built.

Table 4.2 Test Plan

Test Items	Test Type
<i>Login</i>	<i>Black Box</i>
Student Data	<i>Black Box</i>
Absence	<i>Black Box</i>
Theory	<i>Black Box</i>
Value	<i>Black Box</i>
Question	<i>Black Box</i>
User	<i>Black Box</i>

Cases and test results of incorrect data Based on the test plan that has been prepared, the following tests can be carried out:

1. Login Testing

Table 4.3 Login Test

Cases and test results (data correct)			
Entered data	Which is expected	Observation	Conclusion
Enter the username and password according to the user data.	Can login and enter the user dashboard page.	Displays the Login Successful message and the	(√) Received () Rejected

		user dashboard page, as expected.	
Cases and test results (incorrect data)			
Input username and password does not match user data.	Unable to login and enter the user dashboard page.	Displays Login Failed message and returns to the login page.	(√) Received () Rejected
The username and password are left blank then press the Login button.	Unable to process Login.	Displays the message username and password must be filled in the username and password fields.	(√) Received () Rejected

2. Student Data Testing

Table 4.4 Student Data Testing

Cases and test results (data correct)			
Entered data	Entered data	Entered data	Entered data
Input student data according to the input form available on the student data form, then click the create new button	Can process and store student data.	Displays a Successfully Saved Data message and displays the data in the table, as expected.	(√) Received () Rejected
Cases and test results (incorrect data)			
Leave the data input fields blank then press the Save button.	Unable to process and save data.	Displays the message that the input field must be filled in an empty field.	(√) Received () Rejected

3. Absence Test

Table 4.5 Testing Attendance Data

Cases and test results (data correct)			
Entered data	Entered data	Entered data	Entered data
Input the attendance data according to the input form available on the attendance data form, then click the create new button	Can process and store attendance data.	Displays a Successfully Saved Data message and displays the data in the table, as expected.	(√) Received () Rejected
Cases and test results (incorrect data)			
Leave the data input field blank then press the Save button.	Unable to process and save data.	Displays the message that the input field must be filled in an empty field.	(√) Received () Rejected

4. Material Testing

Table 4.6 Material Data Testing

Cases and test results (data correct)			
Entered data	Entered data	Entered data	Entered data
Input material data according to the input form available on the material data form, then click the create new button	Can process and store material data.	Displays a Successfully Saved Data message and displays the data in the table, as expected.	(√) Received () Rejected
Cases and test results (incorrect data)			
Leave the data input field blank then press the Save button.	Unable to process and store data.	Displays the message that the input field must be filled in an empty field.	(√) Received () Rejected

5. Value Test

Table 4.7 Value Data Testing

Cases and test results (data correct)
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Entered data	Entered data	Entered data	Entered data
Input value data according to the input form available on the value data form, then click the create new button	Can process and store value data.	Displays a Successfully Saved Data message and displays the data in the table, as expected.	(√) Received () Rejected
Cases and test results (incorrect data)			
Leave the data input field blank then press the Save button.	Unable to process and store data.	Displays the message that the input field must be filled in an empty field.	(√) Received () Rejected

6. Testing Questions

Table 4.8 Testing Question Data

Cases and test results (data correct)			
Entered data	Entered data	Entered data	Entered data
Input the question data according to the input form available on the question data form, then click the create new button	Can process and store inquiry data.	Displays a Successfully Saved Data message and displays the data in the table, as expected.	(√) Received () Rejected
Cases and test results (incorrect data)			
Leave the data input field blank then press the Save button.	Unable to process and store data.	Displays the message that the input field must be filled in an empty field.	(√) Received () Rejected

7. User Testing

Table 4.9 User Data Testing

Cases and test results (data correct)			
Entered data	Entered data	Entered data	Entered data

Input user data according to the input form available on the user data form, then click the create new button	Can process and store user data.	Displays a Successfully Saved Data message and displays the data in the table, as expected.	(√) Received () Rejected
Cases and test results (incorrect data)			
Leave the data input field blank then press the Save button.	Unable to process and store data.	Displays the message that the input field must be filled in an empty field.	(√) Received () Rejected

Based on the results of testing with the Black Box case, it can be concluded that the software can detect incorrect or missing functions, interface errors, errors in data structures or external database access, performance errors, initialization, termination errors and functionally produce appropriate results expected.