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Designing a Web-Based Student Attendance Information System Using Extreme Programming Methods at the Bandung Praktisi Polytechnic

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Abstract

This research aims to design a student attendance information system. In developing the information system, we used the method of observing research objects and conducting literature studies. We used object-oriented modelling with UML tools to describe the student attendance information system. In addition, extreme programming was used to develop the student attendance information system. In creating a student attendance information system using the PHP and MySQL programming languages as the System Management Database, the test results of the student attendance information system at the practitioner Polytechnic can be used well and effectively.

Keywords: Information System, Attendance, Student, Web, Extreme Programming.

Abstrak

Penelitian ini bertujuan untuk merancang sistem informasi kehadiran siswa. Dalam pembangunan sistem informasi menggunakan metode observasi terhadap objek penelitian selain itu melakukan studi literatur, sedangkan untuk menggambarkan sistem informasi kehadiran siswa menggunakan permodelan berorientasi objek dengan tools UML, selain itu digunakan Exstrime Programming sebagai metode pengembangan sistem informasi kehadiran siswa. Dalam pembangunan sistem informasi kehadiran kehadiran siswa menggunakan bahasa pemrograman PHP dan Mysql sebagai Database Manajemen Sistem, hasil pengujian dari sistem informasi kehadiran siswa pada politeknik praktisi dapat digunakan dengan baik dan efektif.

***Kata-kata kunci**: Sistem Informasi, Kehadiran, Siswa, Web, Exstrime Programming*

1. Introduction

Technology is currently used in all aspects of life, including data processing in education [1]. This technology is used in all aspects, whether teaching research community service or administrative management within tertiary institutions [2] [3]. It concludes that technology is used in education, teaching, and administration [4]. Therefore, technology will constantly develop because of the many needs that are part of the life of these tertiary institutions [5].

The use of technology is part of higher education management, where the higher education institution aims to produce graduates or experts or practical staff who are experts in their field [6]. To make this happen, technology is needed, which is used to maintain data that supports production for these graduates. Therefore, an information system is required to process data that supports the goals of the higher education institution [5].

Currently, universities are competing to use technology in the field of administrative management, significantly eliminating manual recording of dismissals to automatic or digital recording by eliminating paper recordings of data stored in a database [7], whose results will produce information from the effects of processing the data that has been entered. It is one of the challenges for a university manager to create information quickly, effectively and efficiently [8].

Based on this background, the researcher took the title of his research, namely designing a web-based student attendance information system at the Bandung Praktisi Polytechnic.

2. Method

In every research, a method is needed where the method is used as a reference or guide in its implementation [9]. The aim of the method is for the root of the research to be more focused and well structured by the hopes and objectives of the study [8].

In this research, the method used is the Extreme Programming model method where the fimodel is a software or information system development method that has clear stages and is a method that has clear steps from needs planning to implementation where each stage [10].This stage will be tested so that before we carry out the next stage, we have tested the results of the previous stage as shown in **Figure 1** [11].

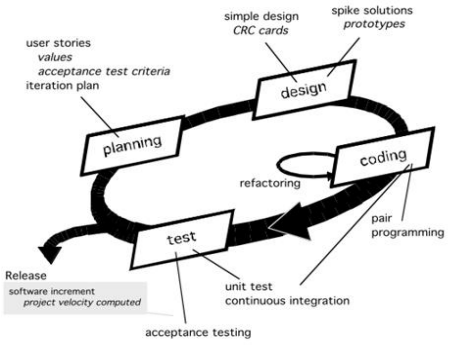

Figure 1. Extrime Programming Method

From the stages in the team model, the author carries out activities based on the sequence according to the stages in the Extrime Programming software development model presented **Table 1**.

Table 1. Research Activity

No	Stages	Activities
1	Planning	At this planning stage, an analysis of the existing needs in a system to be designed is carried out, where the following conditions are obtained: a. The system intended has three users who have access as follows. The first is the administrator, where the administrator carries out administration and manages the entire system in the information system. The second is the lecturer, where the lecturer has access rights to create lecture schedules and check students attending lectures. The third is students, where students can take attendance according to a predetermined schedule. b. Administrators have access to set lecture times, which lecturers can also do. They can also return to the initial settings if undesirable things happen. Apart from that, administrators also have the function of checking and making reports on the results of activities. Attendance by lecturers as well as by students c. The system must be designed to edit the dates or times of lectures where the lecturer will set the meetings held in each lecture. d. Students have the right to take attendance for lecture activities through the system that has been created or designed
2	Desain	The results of the student attendance information system design stages are as follows: a. A use case diagram that describes the business process of the overall system where there are actors (Administrator, Lecturer and Student) and use cases, as well as related associations between use cases and actors b. Activity diagrams describe the activities carried out by actors (Administrator, Lecturer and Student) based on the use cases in the system c. Class diagram, which represents the objects involved in the system and the methods in it d. Sequence diagrams describe the activities carried out by actors on objects in the system
3	Coding	This stage produces coding, programming, or the results of the information system design that has been created, where the design is built using the PHP programming language and also uses the MySQL database management system. Other additional tools are also used to print the data processing that has been carried out.
4	Testing	At this stage, testing is carried out starting from unit testing, namely the units related to entering data, then carrying out the attendance process for managing absence data up to the overall system in the attendance information system, where this testing is carried out by describing or using the black box method.
5	Release	In this stage, the results of the student attendance information system design at the Praktisi Polytechnic will be released.

3. Results and Discussion

There are three parts to the results of the implementation of the stages carried out in designing the attendance information system, where the parts consist of Design, implementation, and testing. The three stages result from implementing the stages using the software design method [2].

3.1 Desain System

The system design will be described using UML diagrams, case diagrams, and activity diagrams, which are used to describe the behavior of the system. Class diagrams are described regarding the connections between objects in the system, followed by a sequence of diagrams that illustrate the activities carried out. By actors regarding the objects in the system based on the use case diagram [3].

a. Use Case Diagram

The diagram will depict the actors involved in the system and also their relationship with the use case diagram, where the use case diagram describes the behavior of the system. The following is Figure 2.

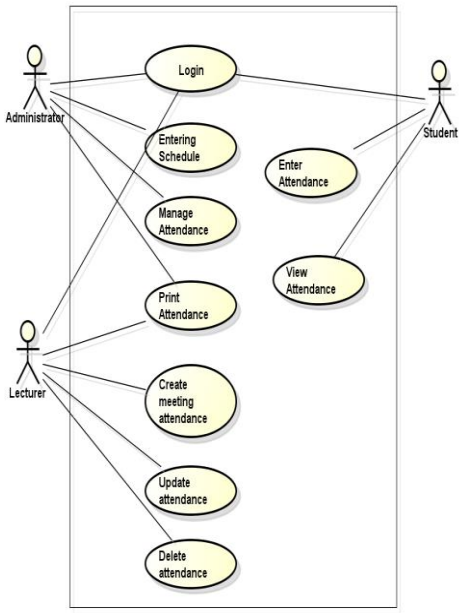

Figure 2. Use Case Diagram

b. Activity Diagram

The activity diagram describes the activities carried out by actors based on the use case diagram in the use case diagram of the student attendance information system, which is seen in Figure 3.

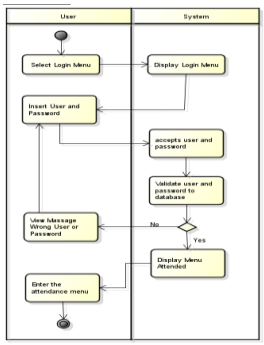

Figure 3. Login Activity Diagram

Entry schedule activity diagram can be seen in **Figure 4**.

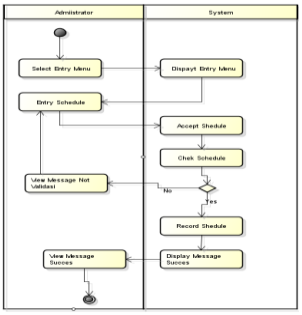

Figure 4. Entry Schedule Activity Diagram

Manage attendance activity diagram is presented in **Figure 5.**

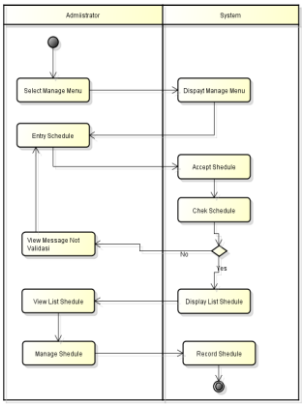

Figure 5. Manage Attendance Activity Diagram

Print attendance activity diagram is presented in **Figure 6.**

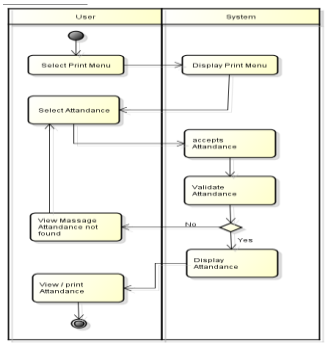

Figure 6. Print Attendance Activity Diagram

Update attendance activity diagram is presented in **Figure 7**, delete attendance activity diagram is presented in **Figure 8**, entry attendance activity diagram is presented in **Figure 9**, and view the attendance activity diagram is presented in **Figure 10**.

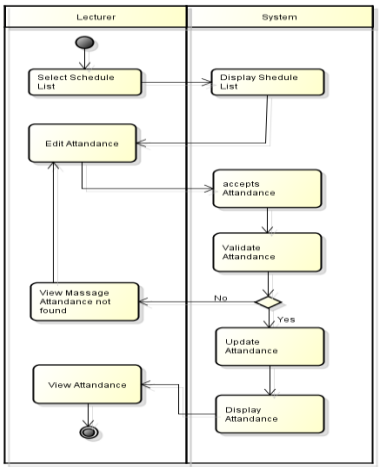

Figure 7. Update Attendance Activity Diagram

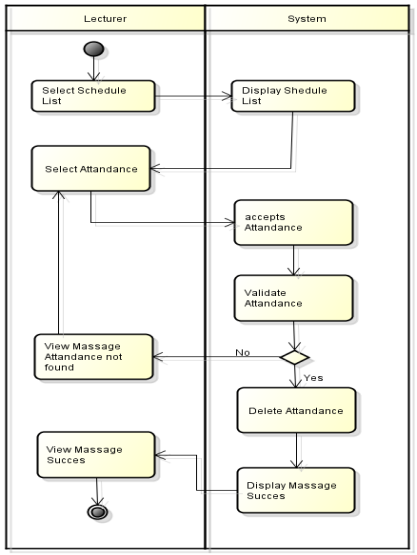

Figure 8. Delete Attendance Activity Diagram

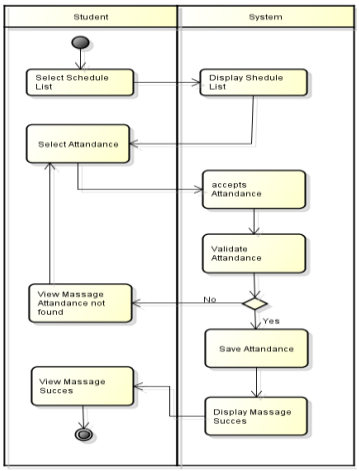

Figure 9. Entry Attendance Activity Diagram

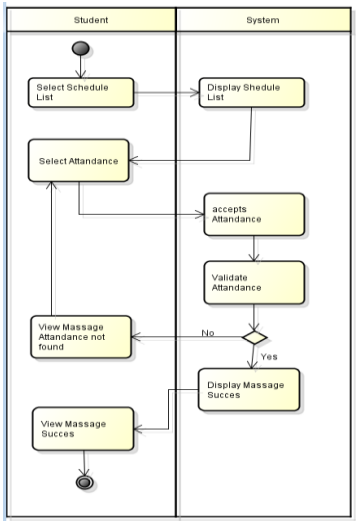

Figure 10. View The Attendance Activity Diagram

c. Class Diagram

Class diagrams are used to describe the class requirements for the student attendance information system. The description of the class diagram can be seen in **Figure 11**.

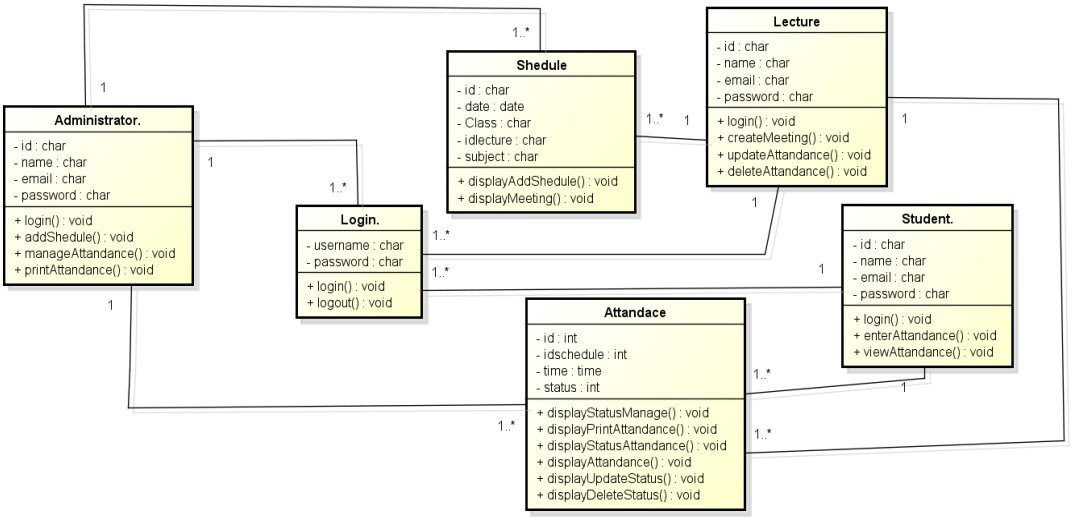

Figure 11. Class Diagram

3.2 Implementation System

In the implementation stage, the design of the program and the integrated database will be explained; this stage is one part of the method stage, namely coding. To start using the system for the first time, users must enter validation as a username and password, where administrators are expected to enter the employee identification number, abbreviated as NIP. Meanwhile, lecturers use the national lecturer identification number or NIDN, while for students to enter, The system uses a user ID, namely the student's identification number or NIM. Meanwhile, the

password uses a password that is set individually for each user. The display can be seen in **Figure 12**.

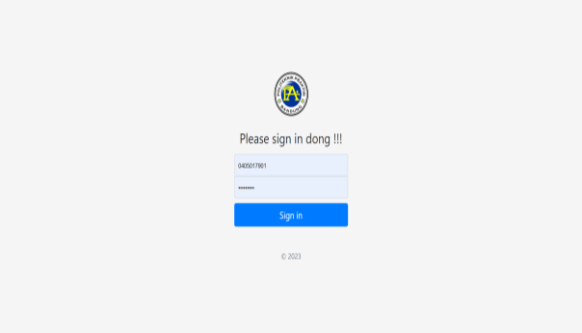

Figure 12. Login Form

The main menu is used as the primary form in the information system, where lecturers will be seen in **Figure 13**, students will be seen in **Figure 14**, administrators will be seen in **Figure 15**, and academics menu will be seen in **Figure 16**.

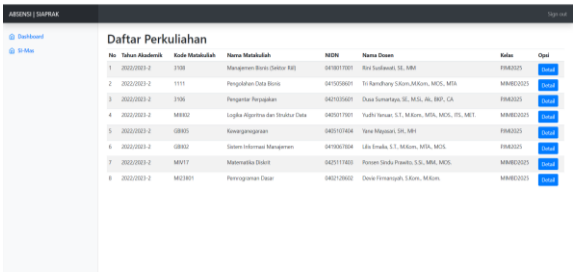

Figure 13. Lectures Menu

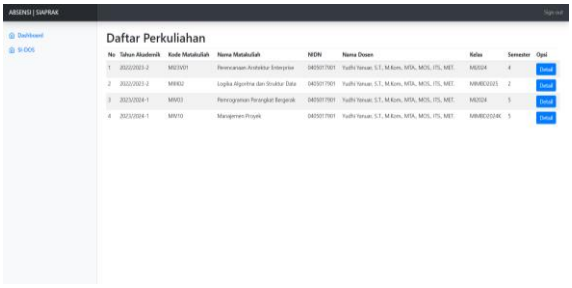

Figure 14. Students Menu

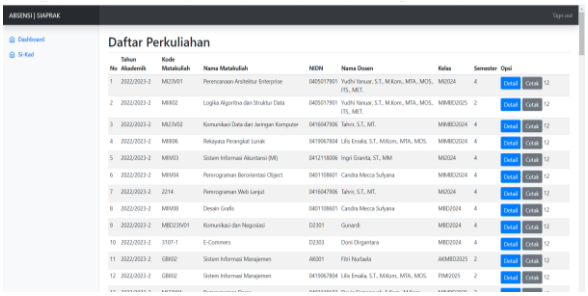

Figure 15. Academics Menu

Academics will have two facilities, namely managing or detailing courses and also being able to print; where to manage details can be seen in **Figure 16**. Meanwhile, for printing, it will be seen in **Figure 17**.

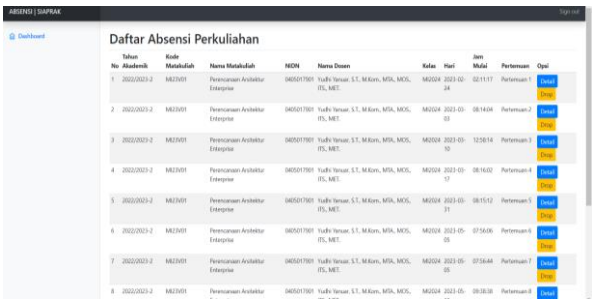

Figure 16. Detail/Manage Schedule

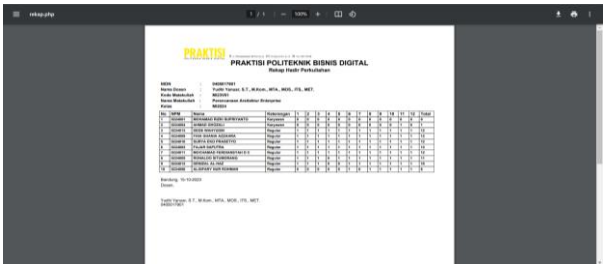

Figure 17. Print Schedule

The agenda-filling menu has two facilities, namely input, as shown in **Figure 18**, and a list of minutes, as shown in **Figure 19**.

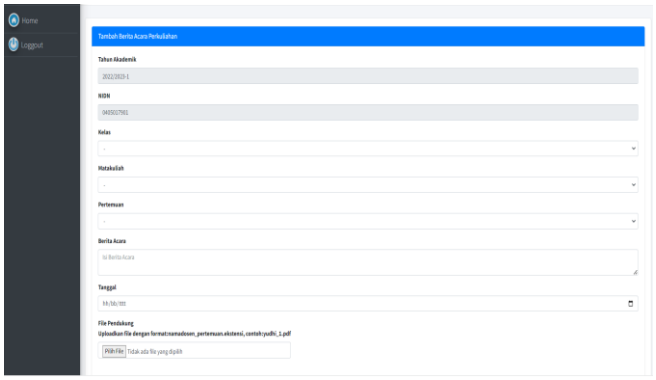

Figure 18. Input Minute of Lectures

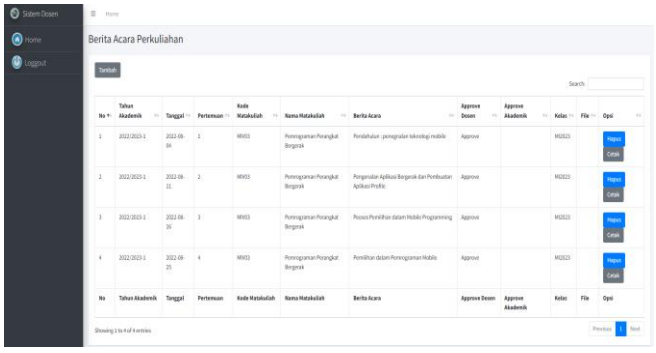

Figure 19. List Minute Minutes of Lectures

Then the value input is shown in Figure 20 and the grade list is shown in Figure 21.

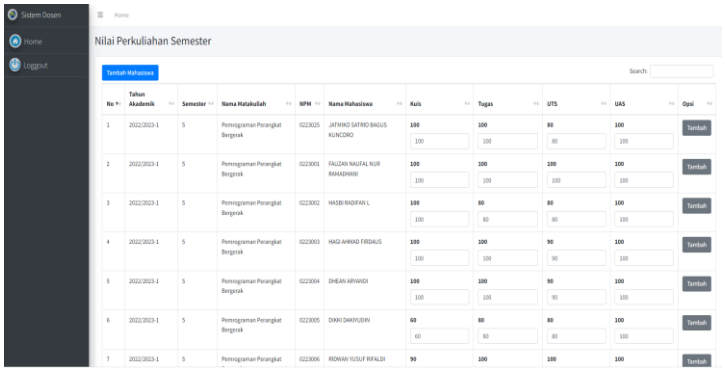

Figure 20. Input Grade of Course

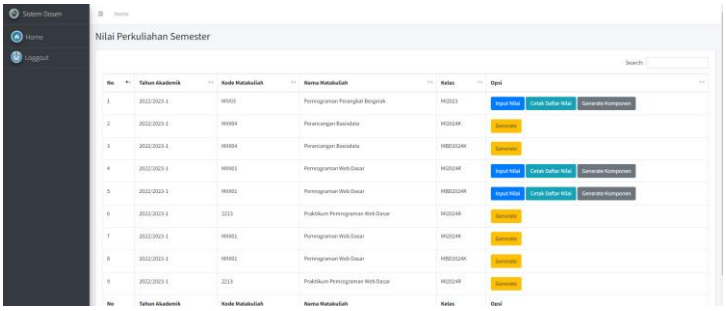

Figure 21. List Grade of Course

3.3 System Test

The next stage in this research is to test the system that has been made [4], where the test process is carried out on logins, academic guidance, lecture minutes, and lecture grades.

a. Login Form Testing

By testing the login form, we can determine whether the system's test results are as expected or not, as shown in **Table 2**.

Table 2. Testing Login Form

Description of Testing	Expected Results	Observation Result
User enters the user ID and password they have correctly	The system will display the main menu	Succes
User enters the user id and password they have incorrectly	The system will display an error message and return to the login screen	Succes

For the next test, a test will be carried out on admin management carried out by the admin, as shown in **Table 3**.

Table 3. Testing Management of attendance Form

Description of Testing	Expected Results	Observation Result
Select courses and lecturers based on the lecture schedule in the academic year	Displays attendance detail pages based on lecturers and courses	Succes
Select attendance details at the existing meeting in academic year	displays attendance detail pages based on lecturers, courses and session	Succes
Select print attendance at existing meetings in academic year	displays a print page of attendance based on lecturers, courses and session	Succes

For the next test, a test will be carried out on lecturer management carried out by the admin, as shown in **Table 4**

Table 4. Testing Lecturer Management of Attendance Form

Description of Testing	Expected Results	Observation Result
Select courses and lecturers based on the lecture schedule in the academic year	Displays attendance detail pages based on lecturers and courses	Success
Select attendance details at the existing meeting in the academic year	displays attendance detail pages based on lecturers, courses and sessions.	Success
Select attendance on the student attendance list based on meetings	Display attendance on the student attendance list based on meetings	Success
Select print attendance at existing meetings in the academic year	displays a print page of attendance based on lecturers, courses and sessions.	Success

For the next test, the admin will carry out a test on student management will be carried out by the admin, as shown in **Table 5**.

Table 5. Testing Student Management of Attendance Form

Description of Testing	Expected Results	Observation Result
Students choose to attend lecture meetings	The system will store attendance on the database	Success
Students see attendance at lecture meetings, and the	System will display attendance.	Success

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4. Conclusion

This study concludes that the attendance information system design is running well, and no errors were found in its operation.

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