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Web-Based Labor Scheduling At Ekasakti University Padang

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Abstrak

This system design aims to produce a labor scheduling information system at Ekasakti University Padang and produce applications that can be implemented. The system development method used in this research is SDLC (System Development Life Cycle). System design tools use UML with several diagrams, including a use case diagram, a class diagram, a sequence diagram, and an activity diagram.
The result of this research is to produce a labor scheduling application at Ekaskti Padang University that can facilitate managing the labor schedule so that there is no problem in inputting the labor schedule.

A. Introduction

In general, the scheduling of teaching and learning activities is developed in a table that contains days, times, classes, labor used, and courses taught. The selected academic scheduling is course scheduling, where each course is given an effective amount of labor and time.

Ekasakti University Padang is a private university under the auspices of the Padang Higher Education Foundation since 1973. It has seven faculties and 22 study programs that have a large number of students. Scheduling practical activities on a campus is complicated and often has difficulties. In the process of inputting data on the use of labor that is continuously carried out by students, it cannot be separated from problems on the computer or in labor as a whole. The problem that often occurs is the clash of lecture schedules in the lab with other faculties, making students unable to attend practical lectures properly and having difficulty finding empty schedules. This results in the unscheduled use of labor by lecturers, who do not give prior notice to the labor officer, resulting in disruption of the learning process. Another impact is the reduction of students' effective learning hours.

The labor schedule-making system uses Microsoft Excel, where the labor officer determines the schedule and then notifies the labor schedule in each labor room and in the operational room. To find out the empty labor schedule, the lecturer sees the labor schedule by looking at the schedule data made by the labor officer using Microsoft Excel. This is less effective and efficient if lecturers or students want to borrow the labor room but are not on campus. So a new system is made that is expected to overcome the existing obstacles through scheduling.

Thus, a website-based scheduling information system is needed. The web-based scheduling information system has the aim of making it easier for administrators to input labor schedules. The course scheduling information system can be connected quickly so that students and lecturers can get the information they need.

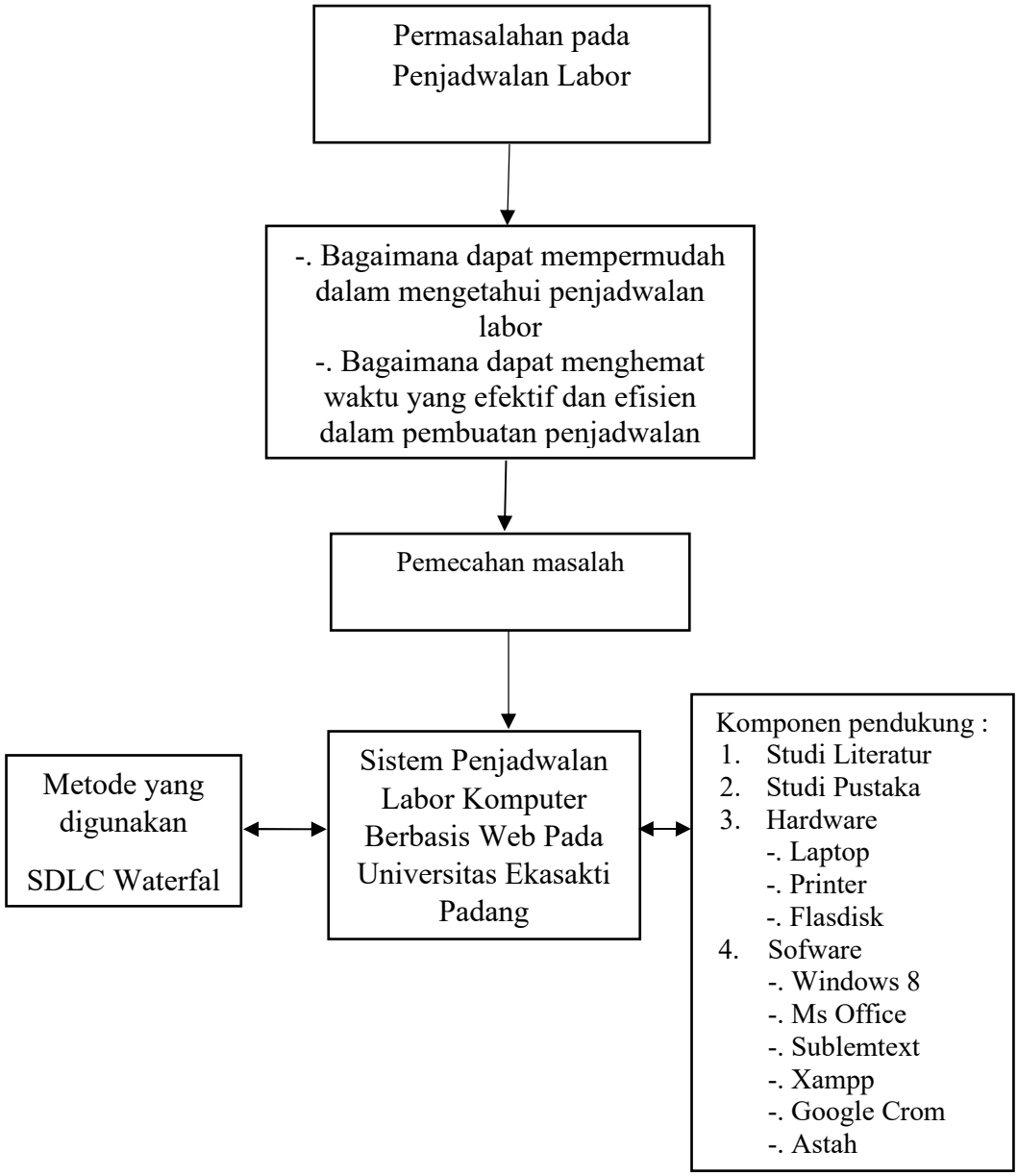

Figure 1: Mind Map of Web-based Computer Labor Scheduling Information System

B. Research Methods

SDLC (Software Development Life Cycle) is the process of developing or changing a software system using models and methodologies that people have used to develop software systems before (based on best practices or well-tested methods). The SDLC model used is the waterfall model, which consists of several stages: 1) Requirement (collection stage); 2) Design (design); 3) Implementation (implementation); 4) The waterfall method is a work method that emphasizes sequential and systematic phases. It is called a waterfall because the process flows one way down, like a waterfall. This waterfall method must be carried out sequentially according to the existing stages.

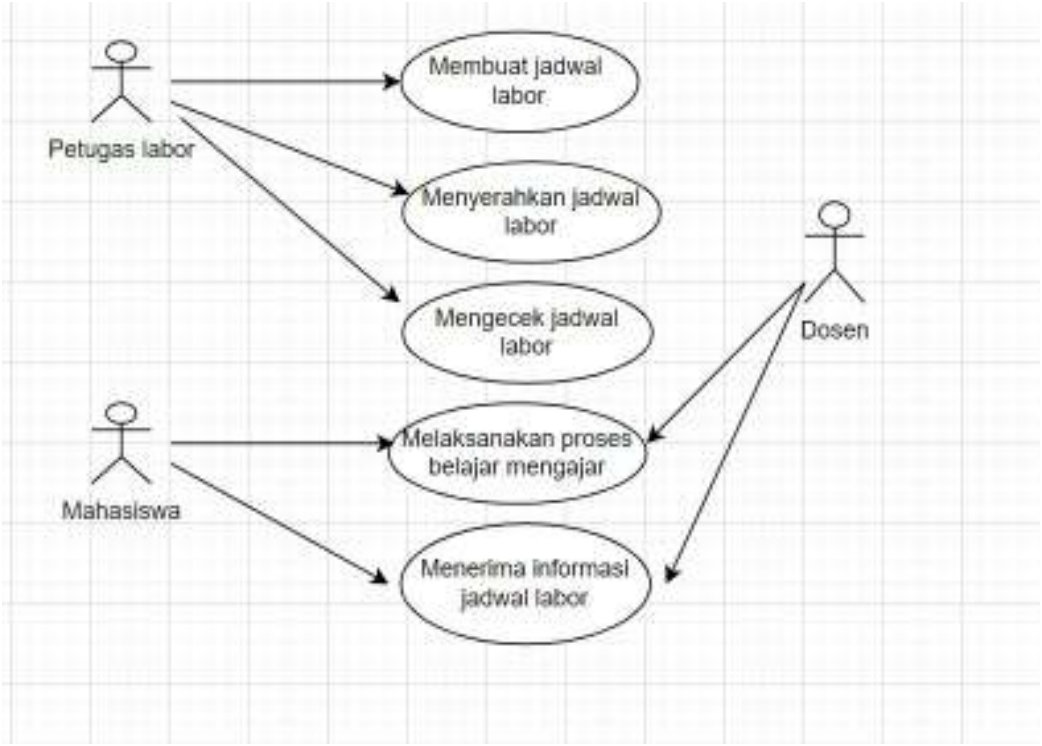

Figure 2: Ongoing Use Case Diagram

Table 1: Components of the current system

No	Actor	Activity
1	Labor Officer	- Make labor schedule - Submitting the labor schedule - Checking the labor schedule
2	Lecturer	- Carry out the teaching and learning process - Receive labor schedule information
3	Students	- Carry out the teaching and learning process - Receive labor schedule information

System Design

For this system design, several variables can be seen in Table 2.

Table 2: Input Variables

No	Variabel	Description
1	Kelas	Classes that will use the labor
2	Hari	Day of labor use
3	Jam	Entry time for using the labor
4	Labor	Types of labor
5	Mata Kuliah	Course in the labor

Based on these variables, rules can be made in the scheduling process using a gate truth table with a total of 2^n rules.
Description:
N = Number of Variables

Table 3: Truth Gate

Rule	KELAS	HARI	JAM	LABOR	MATA KULIAH	OUTPUT
1	0	0	1	0	0	ENTER
2	0	0	1	0	1	ENTER
3	0	0	1	1	0	ENTER
4	0	0	1	1	1	ENTER
5	0	0	0	0	0	ENTER
6	0	0	0	0	1	ENTER
7	0	0	0	1	0	ENTER
8	0	0	0	1	1	ENTER
9	0	1	1	0	0	ENTER
10	0	1	1	0	1	ENTER
11	0	1	1	1	0	NOT ENTERED
12	0	1	1	1	1	NOT ENTERED
13	0	1	0	0	0	ENTER
14	0	1	0	0	1	ENTER
15	0	1	0	1	0	ENTER
16	0	1	0	1	1	ENTER
17	1	0	1	0	0	ENTER
18	1	0	1	0	1	ENTER
19	1	0	1	1	0	ENTER
20	1	0	1	1	1	ENTER
21	1	0	0	0	0	ENTER
22	1	0	0	0	1	ENTER
23	1	0	0	1	0	ENTER
24	1	0	0	1	1	ENTER
25	1	1	1	0	0	NOT ENTERED
26	1	1	1	0	1	NOT ENTERED
27	1	1	1	1	0	NOT ENTERED
28	1	1	1	1	1	NOT ENTERED
29	1	1	0	0	0	ENTER
30	1	1	0	0	1	ENTER
31	1	1	0	1	0	ENTER
32	1	1	0	1	1	ENTER

Description:
1 = Same
0 = Not the Same

From table 3 above, it can be seen that rules 25 to 28 get output not entered. 0 = not the same and 1 = the same is the code for determining the schedule so that there is no clash.
The following is an explanation of the output that does not enter:

1. Explanation of Rule 11 is that classes that are not the same on the same day, time, labor and with courses that are not the same, will produce an output that cannot be entered.
2. Explanation of Rule 12 is a class that is not the same on the same day, time, labor, and subject, will produce an output that cannot be entered.
3. Explanation of Rule 25 is a class that enters on the same day and time in an unequal labor with an unequal course will produce an output that cannot be entered.
4. Explanation of Rule 26 is a class that enters on the same day and at the same time in the same labor with the same course will produce an output that cannot be entered.
5. Explanation of Rule 27 is a class that enters on the same day, time, labor with the same subject will produce an output that cannot be entered.
6. Explanation of Rule 28 is a class that enters on the same day, time, labor and subject will produce an output that cannot be entered.

Based on the truth table can be designed the proposed system in this study using UML (Unified Modeling Language) through stages: Use Case Diagram, Class Diagram, Activity Diagram, and Sequence Diagram. The advantage of building this system will make it easier for the Community to be able to make complaints quickly and effectively.

Use Case Diagram Yang Diusulkan

Untuk mengetahui aktor yang akan digunakan peneliti dapat dilihat pada table 4

Aktor	Keterangan
Admin	People who will manage the system from doing the data input process
Mahasiswa	People who can access the system to view schedule information
KaProdi	People who will do the schedule input process

Based on the table above, the actor functions can be described as follows.

Table 5 Actor Function Table

Actor	Function
Admin	- Manage faculty data - Manage study program data - Manage course data - Manage session data - Managing Labor data - Managing class data - Managing schedule data - Managing class student data
Mahasiswa	- View schedule information
KaProdi	- Manage schedule data

Based on the function actor table, it can be seen that there are 9 functions: the admin actor has 8 functions, while the student and Head of Study Program actors have 1 function.

By knowing the function of the actor can be developed into a Use Case Diagram of the system that will be proposed.

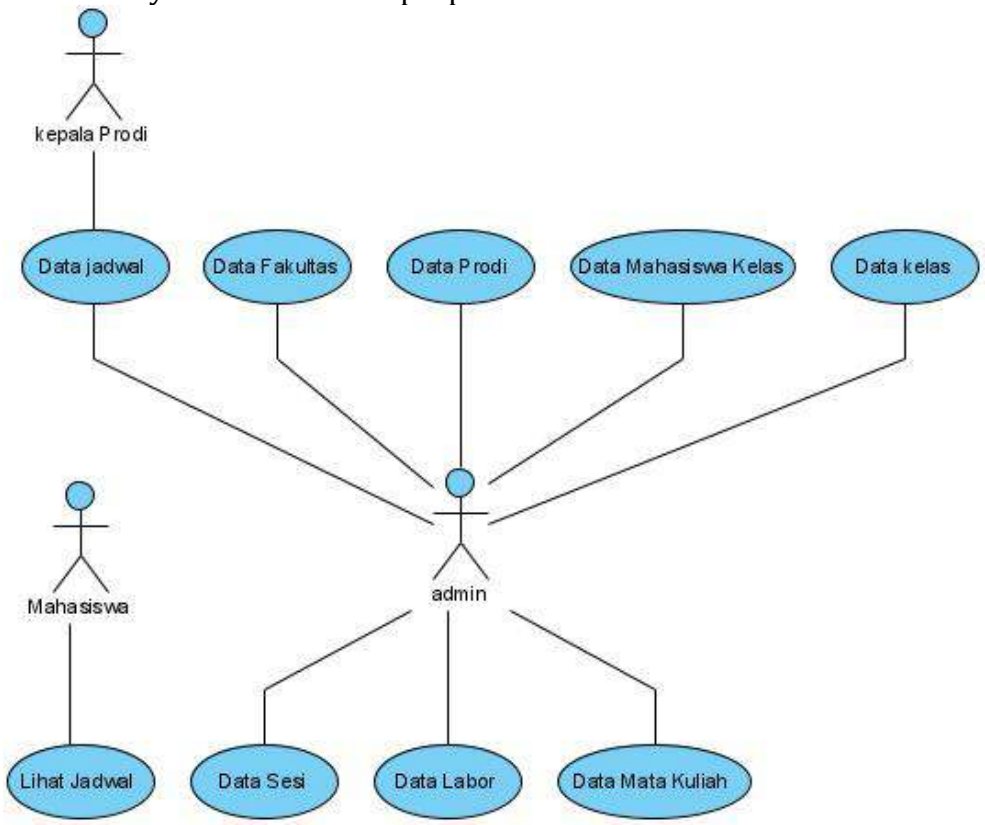

Figure 3: Proposed Use Case Diagram

Class Diagram

In a class diagram, each class is represented by a box that consists of three main parts: class name, attributes, and methods. The class name is placed at the top of the box, while attributes (variables) are placed in the middle, and methods (functions or operations) are placed at the bottom.

Class Diagram

class diagram, setiap kelas direpresentasikan oleh sebuah kotak yang terdiri dari tiga bagian utama: nama kelas, atribut, dan metode. Nama kelas ditempatkan di bagian atas kotak, sementara atribut (variabel) ditempatkan di bagian tengah dan metode (fungsi atau operasi) ditempatkan di bagian bawah.

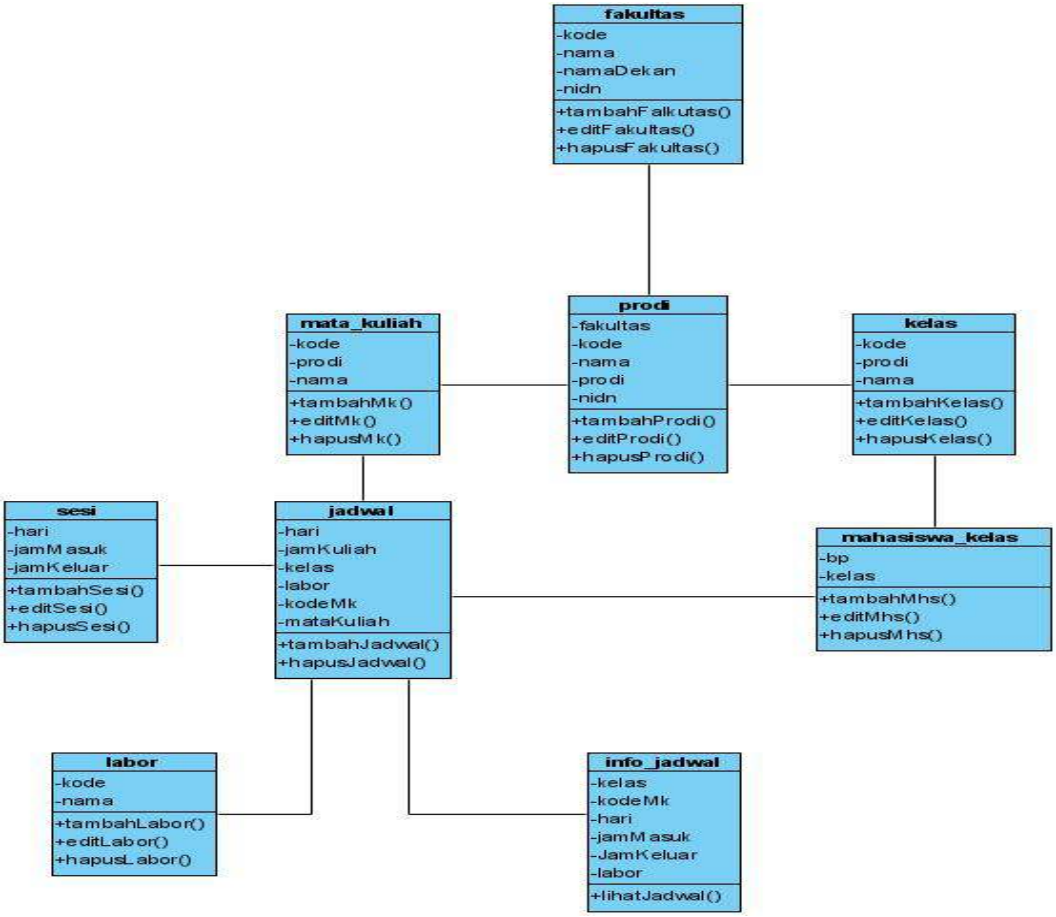

Figure 4: Proposed Class Diagram

C. Results and Discussion

The result of system implementation is the stage of implementing software that has been implemented, applied, and designed to be fully run. This stage is the stage where the system is ready to be operated at Ekasakti University Labor Padang.

1. Login Page Admin, Student, and Head of Department

The login page before the admin, students, and head of study program enter the application system by entering the username and password, then clicking the sign in button.

Figure 5 Display of Labor Scheduling Web Page

2. Admin Home Page

On the Admin home sidebar page which contains the home menu, manage users, faculties, study programs, courses, labor, classes, sessions, class students, and schedules. Which each admin menu can manage.

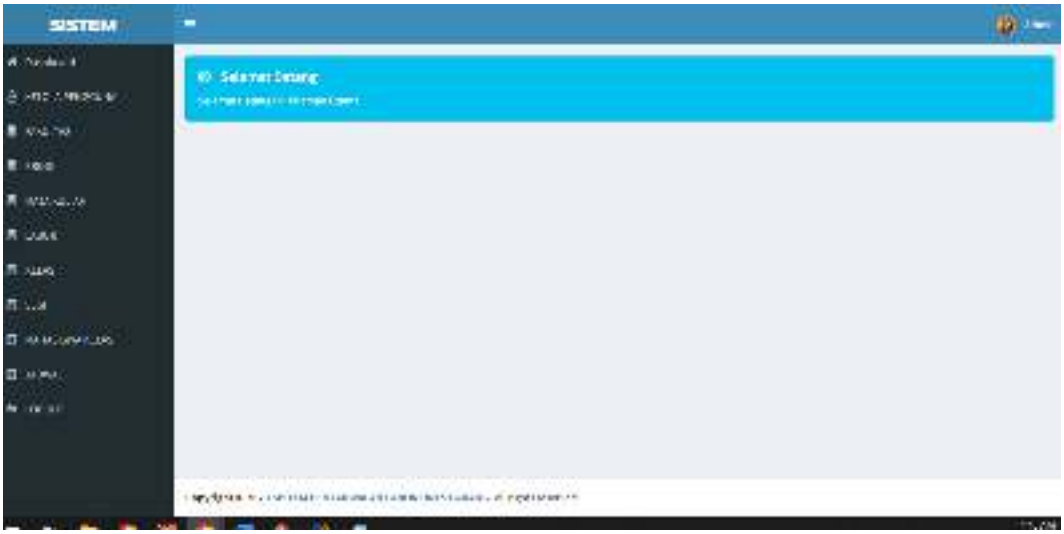

Figure 6 Admin Home Page Display

3. Home Page Add Labor Schedule

On the sidebar page the admin manages the added labor schedule. To fill in the data add a schedule as shown below;

Figure 7 Display of Add Schedule

4. Home Page SidebarAdminSession Data

On this page serves for the admin to manage the labor usage schedule, so that the same hours do not occur between classes.

Figure 8 Admin Page Viewing Session Data

5. Faculty Page

On this page the admin can manage faculty data that will use the labor by entering the faculty code, faculty name, dean's name or the required data.

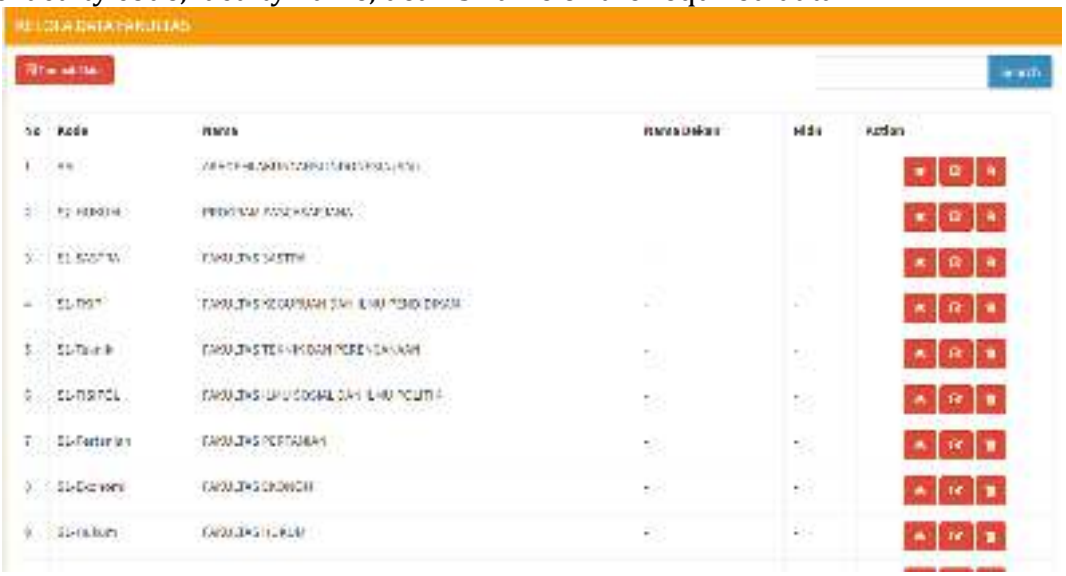

Figure 9 Faculty Page View

6. Prodi Page

On this page the admin can manage study program data that will use the labor by entering the faculty name, study program name, and the required data.

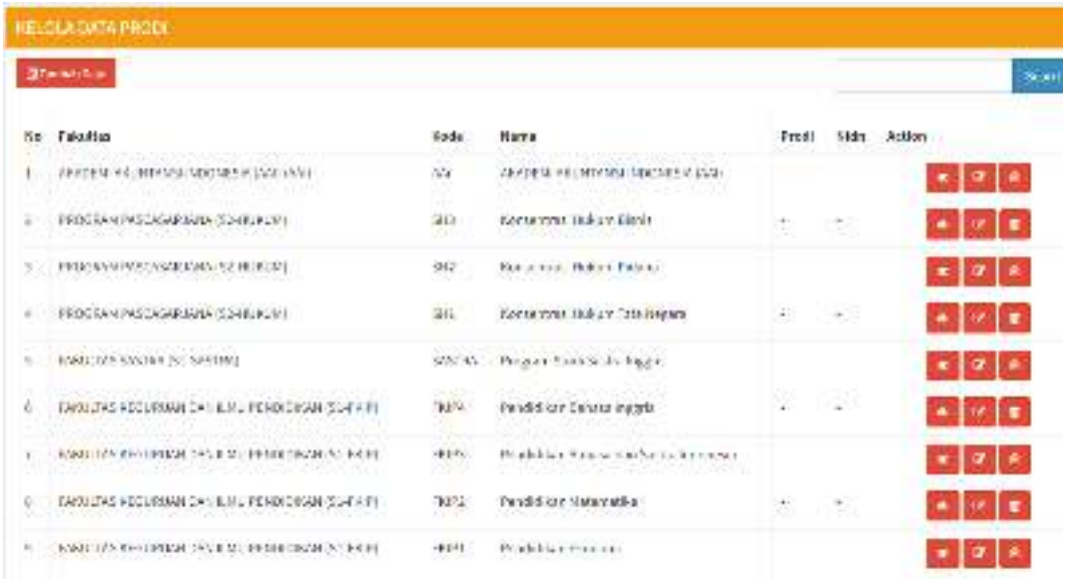

Figure 10 Display of Prodi data page

7. Labor Page

On this page the admin can manage labor data by entering the labor code and labor name.

Figure 11 Display of Labor Page

8. Class Page

On this page, the admin can manage class data that will use labor, by entering the class code and study program, which will use labor.

Figure 12 Class Page View

D. Conclusion

The development of a Web-based Labor Scheduling System at Ekasakti University Padang aims to assist officers and study program heads in the process of inputting labor use schedules. The input process has gone through the rule verification process. The system can be accessed online, making it easier for users to access from anywhere.

D. Conclusion

The development of a Web-based Labor Scheduling System at Ekasakti University Padang aims to assist officers and study program heads in the process of inputting labor use schedules. The input process has gone through the rule verification process. The system can be accessed online, making it easier for users to access it from anywhere.

E. Acknowledgments

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