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Analysis of the Management Information System of MBKM at Prima Indonesia University Using the Waterfall Method

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ABSTRACT

Implementing MBKM activities in the field has challenges for students and the unavailability of MBKM information within the campus environment is an obstacle to participating in MBKM. This research is to analyze and build a web-based MBKM information system using the Laravel framework and an effective System Development Life Cycle (SDLC) model to support the implementation and monitoring of MBKM activities on campus. Researchers provide solutions to the obstacles faced by students in participating in MBKM activities, so that this program can run more smoothly and achieve the researchers' goals. The SDLC model is a model for developing website-based information systems. SDLC provides a systematic and structured approach to ensure that the software being developed meets requirements. The research results show that the SLDC model produces business processes that need to be developed, namely adding access rights for stakeholders to make it easier to assess study programs, and the need for involvement of system programs (Prodi) for assessing MBKM student activities. Researcher's suggestions for the security of using user accounts and access rights for Human Resources with experience in MBKM activities.

Keywords: Watrefall, Website, UML, SDLC

INTRODUCTION

Merdeka Belajar Kampus Merdeka (MBKM) aims to prepare every student to have a career in the future according to their interests. From this MBKM activity, every student has the opportunity to develop learning abilities from practical experience in the industrial world, integrated with the training system, MBKM which was founded to create an innovative learning community. Every university takes strategic actions to remain superior in all fields due to advances in information technology. The academic process can help understand the role of information technology in higher education (Aswati et al., 2015). Students are given the opportunity to choose the subjects they like most in this program. Not only are they highly educated.

The ability to be an agent of change, both small and large. From 60.2% of research on the implementation of the MBKM program from a student perspective and in terms of innovation changes which contribute greatly to the development of the country have qualified personnel (Masitoh et al., 2021). Using the Laravel framework developed in this research, the MBKM registration program aims to create a website where students can select supervisors, access survey information, register in the MBKM program, and manage registration data (Sephira & Krisnanik, 2021). The lack of information about MBKM makes it difficult for students to participate in MBKM activities. The aim of this research is to create an information system that allows students to understand the MBKM program. The research method used is a web-based software development method with the System Development Life Cycle (SDLC) model. The procedures that have been designed are conveying information related to MBKM activities, testimonials from students who have taken part in MBKM, requirements and registration for taking part in MBKM activities (Hamonangan Siregar et al., 2022). Prima Indonesia University, one of the largest private university campuses in North Sumatra, is currently taking part in the MBKM program with eight activities. These activities include internships, student exchanges, independent studies, teaching campuses, entrepreneurship, building villages or real work lectures, practical work internships, educational teaching assistance, building villages/thematic KKN, and research. So far, MBKM activities at UNPRI have not been coordinated properly, where there is no summary of student reports, the number of students who are active in activities is unknown, there is a lack of activeness of lecturers in participating in MBKM and there is no communication from one faculty to another so that students are still Many people don't understand MBKM, so researchers want to know how effective MBKM is: "a waterfall model-based MBKM monitoring information system at a Prima Indonesia University."

LITERATURE REVIEW

Information Systems

An information system is an organized system used to provide information for decision making and control within an organization." In linguistics, an information system is a system that can be defined as a collection of people or people who work together constructively to achieve the same goal(Kurniawan et al., 2021).

Information System Objectives

The goal of information systems development is to create products that involve data collection. Information systems actually contain various types and types of information that can be processed in a way that makes it easier for users to see them.

Definition of Information.

An information system is a set of procedures, software, hardware, data storage, and network infrastructure designed to collect, store, process, and distribute user-related information to various levels of an organization to support decision making, process management, and value. In other words, information systems include various technological and human elements that work together to manage data and information to support various organizational activities, from operational to strategic. Information systems can be manual or computer-based systems, depending on the complexity and needs of the organization. The main goal of a Information systems are to increase efficiency, effectiveness and effectiveness by providing fast and accurate information regarding the required information. Information systems are to increase efficiency, effectiveness and effectiveness by providing fast and accurate information regarding the required information(Kurniawan et al., 2021)

Database Planning (Database planning)

Management activities that support the operational cycle to achieve efficient and effective results. Database planning must be coordinated with an organized general information system. Database planning must be coordinated with the organization's general information system. (Wiro Sasmito, 2017).

The methods section describes the steps followed in the execution of the study and also provides a brief justification for the research methods used (Perry et al., 2003:661). It should contain enough detail to enable the reader to evaluate the appropriateness of your methods and the reliability and validity of your findings. Furthermore, the information should enable experienced researchers to replicate your study (American Psychological Association, 2001:17).

Entity Relational Model

Entity Relationship Model is a structural representation in the form of a diagram, E-R diagram. Functions for defining relationships between two files or two tables can be classified into three types of relationships: one-to-one, one-to-many, and many-to-many. This diagram will help systems analysts draw the process, which will later be depicted as a line:

- ✓ Domain is also called a domain structure which is represented by a domain diagram.
- ✓ Row fields or data attributes are represented by pie charts or ellipses.
- ✓ Connections or relationships between regions are symbolized by parallelograms

Information Systems Development

Waterfall

The waterfall method is where work on a system is carried out sequentially or linearly, so if you haven't done step one, you won't be able to do steps 2, 3 and so on. Automatically the 3rd stage will be able to be carried out if the 1st and 2nd stages have been carried out. In general, the waterfall method has the following steps: Analysis, Design, Code and Testing, Implementation and Maintenance (Sabatini et al., 2022).

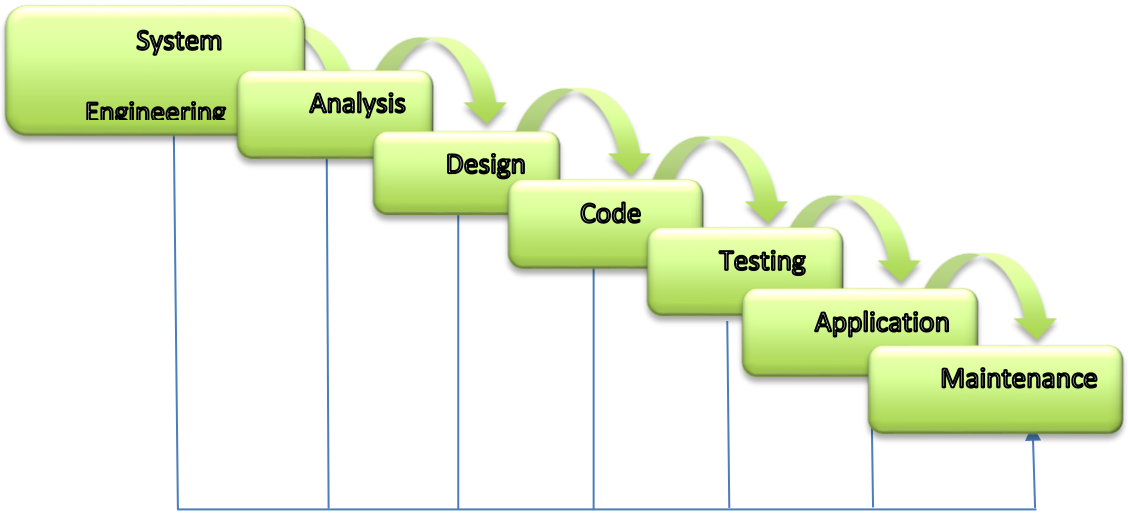

Figure 1. Stages of the Waterfall Method

Stages of the Waterfall Method

a. Analysis

This step is an analysis of system requirements. Data collection in this stage can be carried out by conducting research, interviews or literature studies. This stage will produce a user

requirements document or can be said to be data related to the user's desires in creating the system.

b. Design

The design process will translate the requirements into a software design that can be estimated before coding. This process focuses on: data structures, software architecture, interface representation, and procedural (algorithmic) details. This stage will produce a document called software requirements.

c. Coding & Testing

Coding is translating a design into a language that can be recognized by a computer. Carried out by a programmer who will translate transactions requested by the user.

d. Application

This stage can be said to be the final stage in creating a system. After analyzing, designing and coding, the finished system will be used by the user.

e. Maintenance

Software that has been delivered to customers will definitely experience changes. These changes can be due to errors because the software must adapt to a new environment (peripheral or new operating system), or because customers require functional developments.

METHODS

Data analysis

a. Observation

This observation method is carried out by direct inspection and research in the field to obtain and collect the required data. Observation activities were carried out directly at Prima Indonesia University, the activities carried out were analyzing the activities carried out by students taking part in MBKM.

b. Interview

Information is collected through direct/verbal communication and information is provided both face to face and by telephone. Interviews were conducted directly with field managers and students at Prima Indonesia University. Collect information from agencies/institutions in written or electronic form and test the system that has been created. Documents are required to support the information (Attachment 1: Interview Results).

c. Design

Design an entry tool used to enter data required in the process of creating reports that are desired to be read and understood by system users. At this stage the researcher begins to design a web system such as:

1. Usecase Diagram: At this stage the researcher tries to create system requirements and understand how the system works.
2. Activity Diagram: Researchers create a workflow from one activity to another. This stage is very useful when we want to describe how the behavior in various use cases interacts.

d. Code

The coding process was carried out in stages, in and out, step by step. In the first part, the researcher read the data completely while providing codes according to a predetermined scheme.

e. Testing

Tacha testing is carried out regarding input and output functions. The set input conditions are defined first, Then the input set is adjusted so as to produce an output that can be evaluated.

f. Maintenance

At the maintenance stage, security system maintenance is carried out to uncover problems with the system and make necessary repairs or adjustments so that system operations run well as planned.

RESULTS

Waterfall Method Development Model

Now start designing the MBKM information system to find out the features and functions every user. See the image below for more information regarding the features or functions that each user can perform.

a) Usecase Information System Diagram MBKM

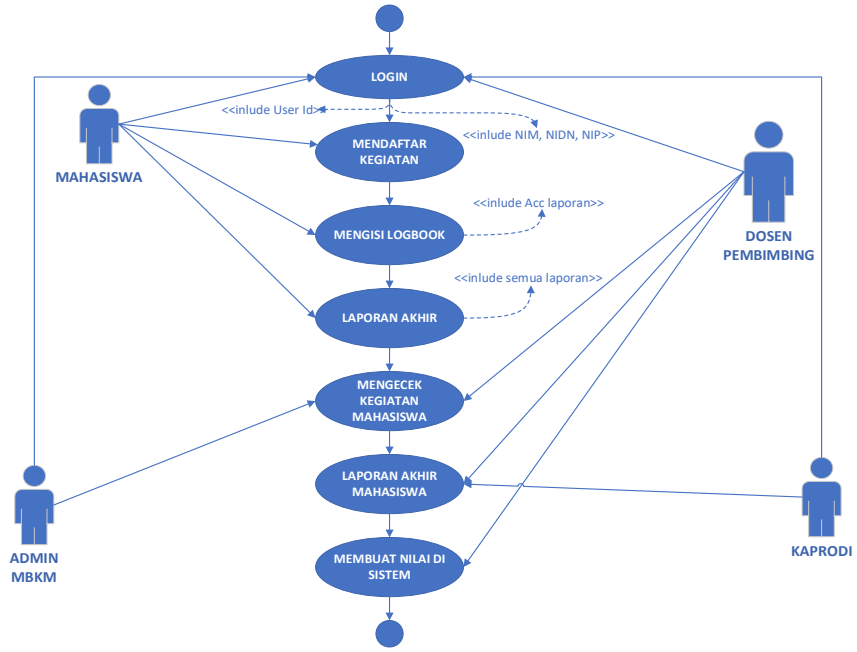

Figure 2. Usecase Information System Diagram

Users who work on the Merdeka Belajar Kampus Merdeka (MBKM) information system are lecturers in the learning information system and students who communicate with each other to carry out activities. Users can log in with their accounts registered in the database system. Students are responsible for providing proof of implementation of MBKM, while teachers in the learning information system are responsible for verifying proof of activities that students have uploaded. Students can check whether evidence of MBKM activities has been uploaded to the information system and has been validated by the information systems study program lecturer. Activity diagram of the Merdeka Belajar Kampus Merdeka (MBKM) information system for both users has a process that must be carried out, namely the login process by filling in the login form to validate the user ID and password for information systems study program lecturers while for students use the NIM and Password which are integrated with the system Prima Indonesia University Academic Information. After successfully logging in, the user will be displayed on the home page based on their role to be able to carry out activities based on

their function. It can be seen in the picture above that students have a function as a source of MBKM data, namely uploading all data, reports during the implementation of activities, MBKM conversion forms and certificates along with grades from MBKM partners to the system for validation by Information Systems Study Program lecturers as a form of MBKM activity check list. that has been done. Lecturers can also carry out data management if errors occur in writing or uploading evidence of MBKM activities. This is done so that the activity reporting process becomes more effective. So this system can help and make it easier for each lecturer in the Information Systems Study Program at Prima Indonesia University to monitor each student when taking part in MBKM activities. (Sephira & Krisnanik, 2021)

b) Information System Class Diagram MBKM

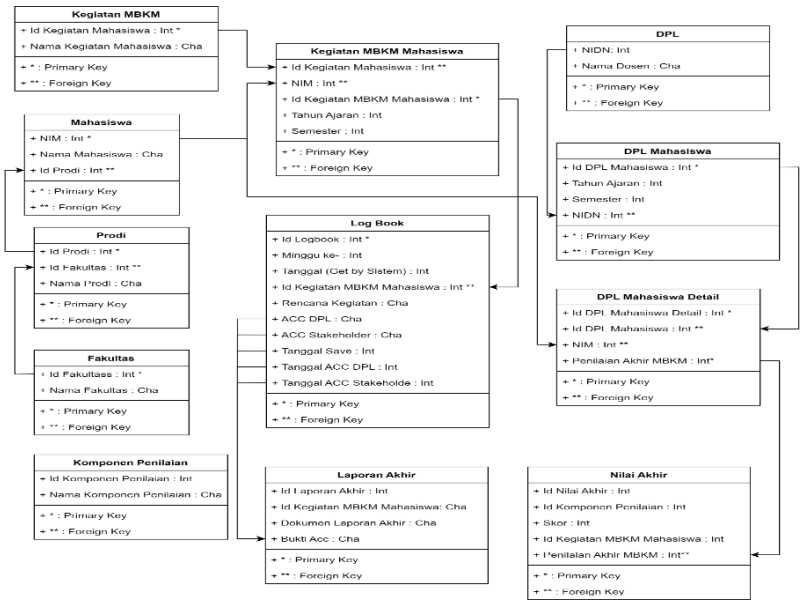

Figure 3. MBKM Information System Class Diagram

Information Systems Design

Information system design is an important stage in software development which includes various steps to design the structure, components and functions of the system to be built. The following are general steps in designing an information system for the MBKM Monitoring Information System based on the SDLC model at Prima Indonesia University.

In designing the Merdeka Belajar Kampus Merdeka (MBKM) information system, the first step that must be carried out by the four users is to access the MBKM website which is already available. After accessing the MBKM website, the four users will appear on the home page on

their respective screens. After that, the four users are required to log in first using their respective accounts that have been provided, namely the login process by filling in the login form to validate the user ID and password, while students use the NIM and Password which are integrated with the Prima Indonesia University Academic Information System. After logging in, students are required to choose one of the activities to take part in on the MBKM website. In the final stage, students can see what activities are currently taking place or what activities the student has registered for. Before that, students can also view history to check what they have done. After students have carried out the activity, students are required to submit a weekly report which can be rejected or accepted by the supervisor during the activity.

Reporting Research Results

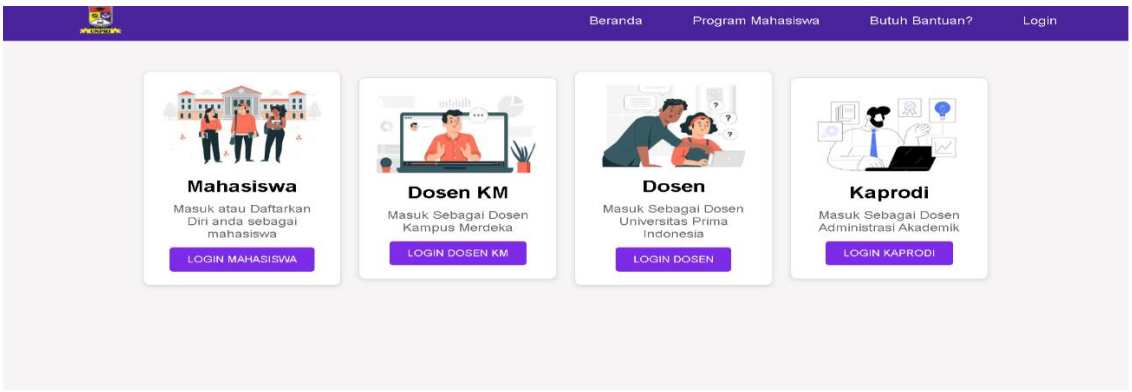

Figure 4. Multiple User

The multiple user view is about how the system allows access by several users at the same time to the operating system or application. With multiple user displays, users can work efficiently and organized, with access appropriate to their role, and with a display that is clear and easy to understand.

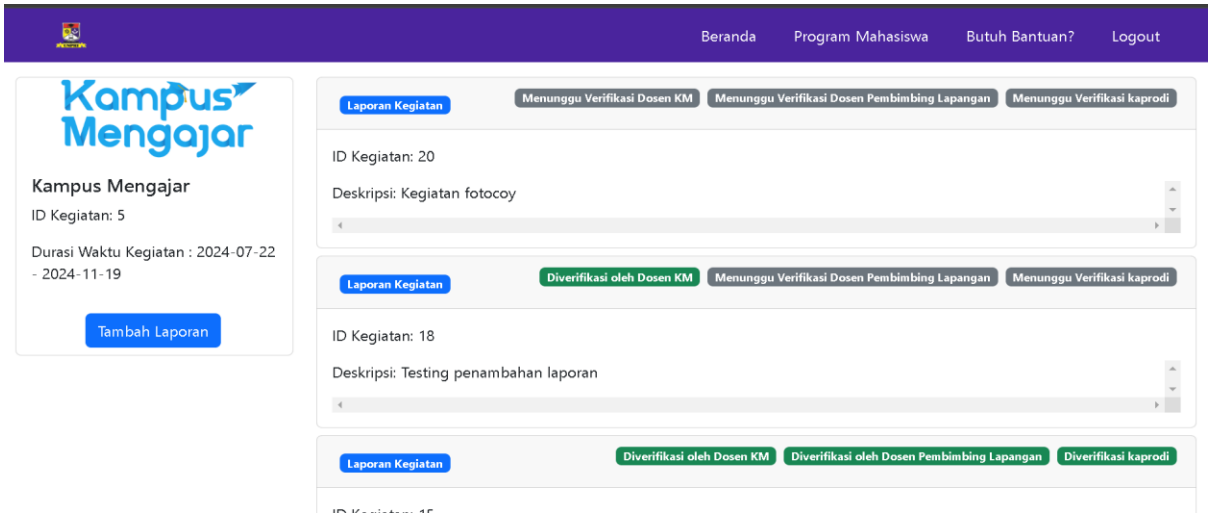

Figure 5. Dashboard Students

Form for managing Activity Reports Students or program participants can add their activity reports via the "Add Report button after that Waiting for Verification. Displays the status of reports that are still waiting for verification from various parties such as Dosen KM , Dosen Pembimbing Lapangan, and Kaprodi.

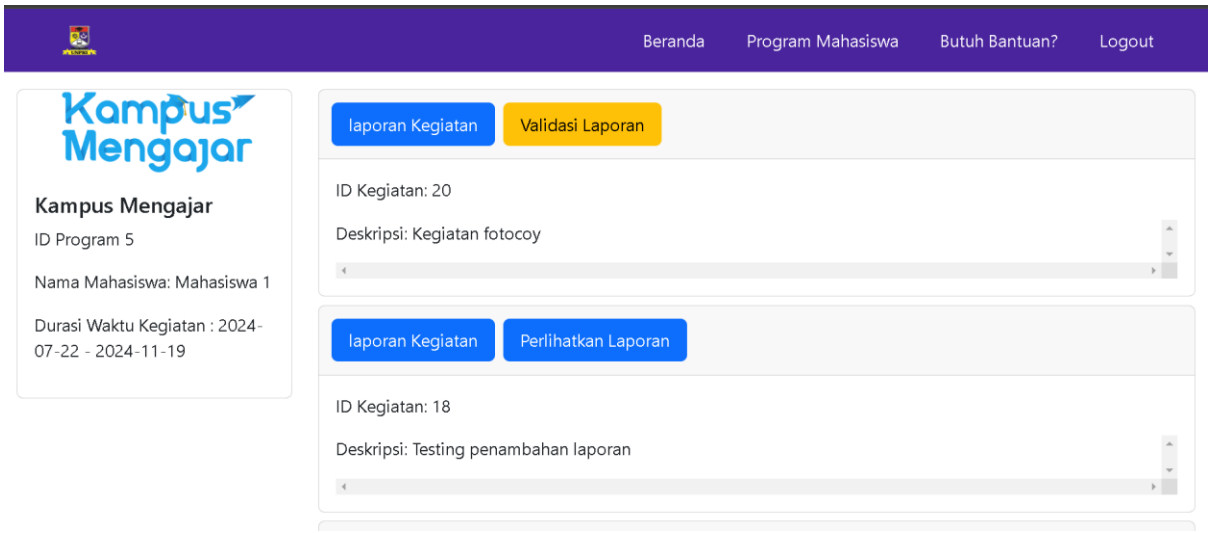

Figure 6. Dashboad Lecture Kampus Merdeka

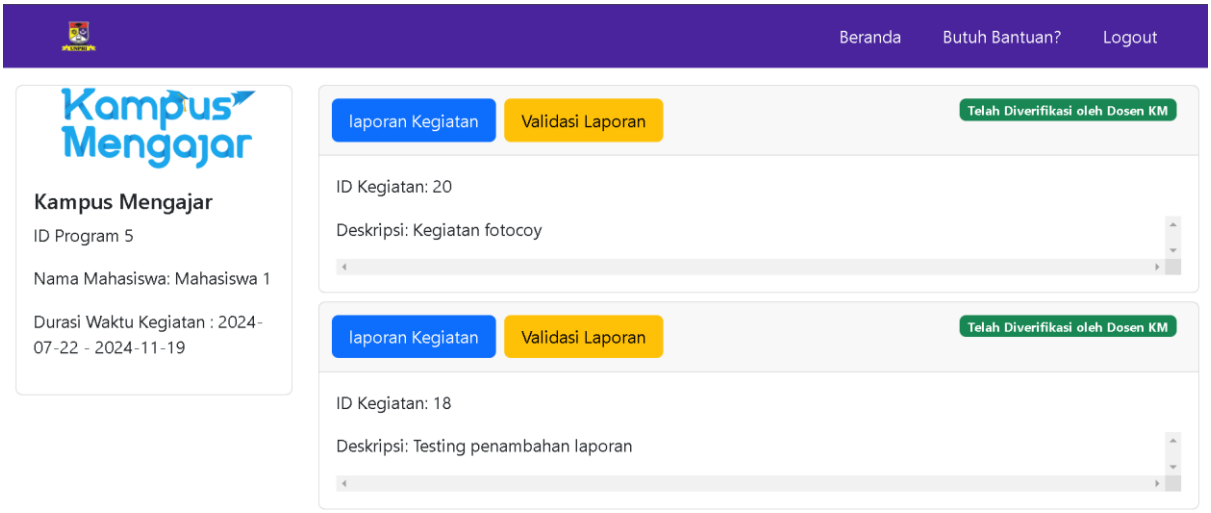

Figure 7. Field Supervisor Dashboard

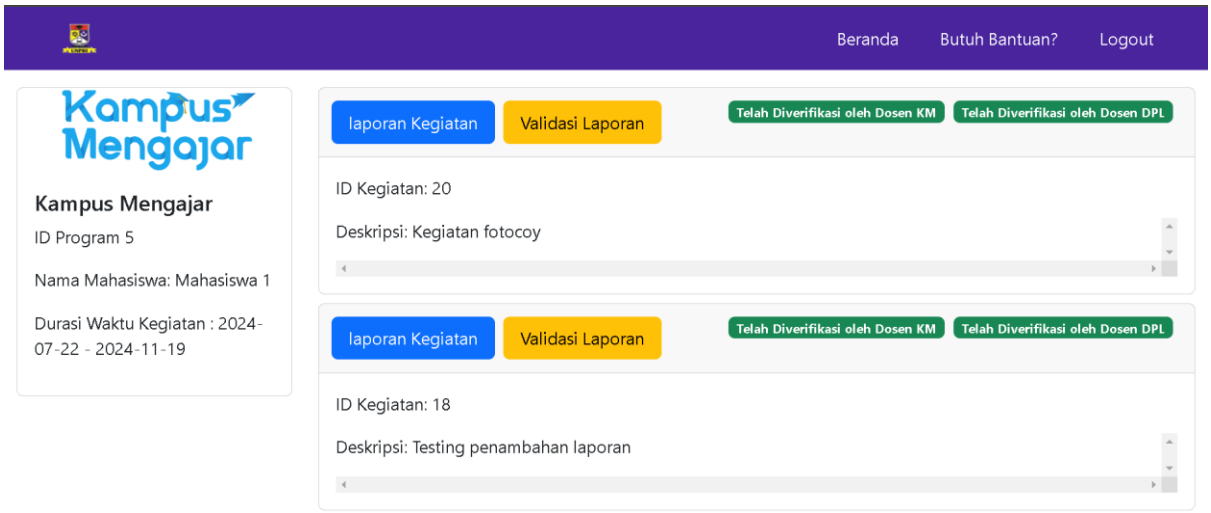

Figure 8. Dashboard Kaprodi

Interface display of the Teaching Campus program. In this section there is information about the program and participants such as program ID, student name, activity duration, activity report, homepage and student program.

Figure 9. Add Report Form

The Add Weekly Program Activity Report form is an important tool for recording and reporting activities carried out in a weekly period. This form functions to provide a clear picture of the implementation of activities, as well as as a tool for evaluation and accountability to related parties. This report can also be used for planning future activities.

Figure 10. Validate reports from kampus merdeka Lecturers, Field Supervisors, and Heads of Study Programs

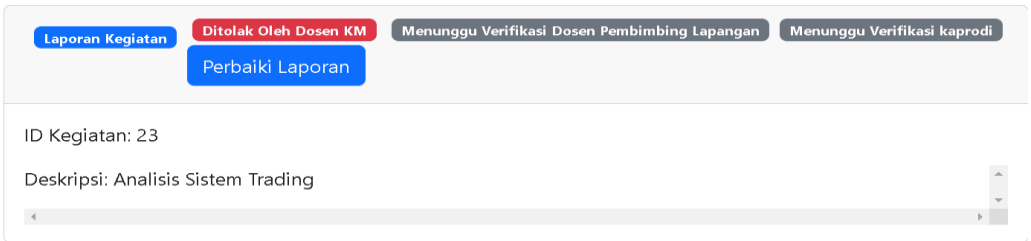

Figure 11. Activity Display If Rejected

CONCLUSION

Research concludes that there are several points:

1. The results of the research team's analysis using the SLDC model show that there is a business process that needs to be developed, namely adding access rights for stakeholders to make it easier to assess study programs.

2. The need for involvement of system programs (Prodi) for assessing MBKM student activities

The results of the research suggest that the information system that the research team is developing still needs to be developed with a wider scope, for example for the security of the use of user accounts and access rights for human resources with experience in MBKM activities.

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