Management Information System for Field Work Practice Faculty of Science and Technology

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ABSTRACT

In the era of the Fourth Industrial Revolution, digital transformation becomes crucial for enhancing efficiency and quality across various sectors, including higher education. The Faculty of Science and Technology at Ibrahimy Sukorejo University, as a leader in knowledge and technology development, faces the demand to continuously innovate in supporting student learning experiences. Implementing digital practices in higher education, particularly in managing Field Work Practice (FWP), encounters significant challenges. Adopting a Field Work Practice Information System (FWPIS) can streamline the entire FWP management process, traditionally handled manually, into computerized processes. Hence, it's imperative to develop a web-based FWP management information system that can assist students in accessing updated information regarding post-registration FWP steps. Challenges in managing and optimizing FWP implementation at the faculty level include information delays, administrative error risks, and limited student involvement. Thus, developing an innovative Field Work Practice Management Information System (FWP-MIS) is crucial to elevate higher education to excellence. This research aims to create an efficient and adaptive FWP-MIS meeting the needs of students, academic supervisors, and administrative personnel by leveraging cutting-edge technologies like artificial intelligence and data analytics. Implementation of this solution is expected to offer a more structured FWP experience for students and serve as a model for other higher education institutions.

Keywords : Fourth Industrial Revolution, Field Work Practice Management Information System, Higher Education, Digital Transformation.

INTRODUCTION

In the era of the Fourth Industrial Revolution, digital transformation has become imperative for enhancing efficiency and quality across various sectors, including higher education. The Faculty of Science and Technology at Ibrahimy Sukorejo University stands at the forefront of knowledge and technology development and is confronted with the demand for continuous innovation to support students' learning experiences. However, the implementation of digital practices in higher education, especially in managing Internship Programs (PKL), still faces significant challenges.

The utilization of an Internship Management Information System (PKL) can streamline the entire process of managing PKL, transitioning from conventional methods to a computerized system. Hence, to address this issue, a web-based PKL management information system is needed to assist students in accessing the latest information regarding the steps to be taken after completing the PKL registration process. Challenges faced in managing and optimizing the implementation of PKL at the faculty level include delayed information, the risk of administrative errors, and a lack of student involvement in PKL management. Delayed information in PKL management can hinder the student learning process and reduce the efficiency of PKL program implementation. Additionally, the risk of administrative errors can lead to issues impacting the faculty's reputation and overall student learning experience.

Through Internship Programs (PKL), students gain the opportunity to develop both technical skills and soft skills essential in the professional world. However, achieving this goal requires active student participation in PKL management. Currently, many educational institutions still face challenges in ensuring optimal student involvement in the PKL management process. This lack of engagement can be

attributed to various factors, ultimately negatively impacting the effectiveness of the PKL program and the benefits gained by students.

One common issue that arises in the Internship Program (PKL) process is the lack of understanding among students regarding the process and objectives of PKL. Unclear information, unrealistic expectations, and inadequate guidance often serve as the main causes of this misunderstanding. Students who do not fully comprehend what is expected of them during PKL tend to be less motivated and ill-prepared to face potential challenges. Therefore, it is important for educational institutions to improve communication and provide clearer information about PKL to students. Consequently, they can maximize the benefits of this learning experience and prepare themselves well for their future professional careers. Leveraging the latest technology, researchers aim to develop a PKL Management Information System that is not only efficient but also adaptive to the needs of students, supervising faculty, and administrative staff.

With these challenges in mind, this research aims to develop a system that facilitates the administrative process related to managing Internship Programs (PKL). The implementation of the PKL Management Information System in the Faculty of Science and Technology aims to enhance efficiency in PKL management.

METHOD
1. **Type of Research**
   a. Library Research
   The literature review is a qualitative research method that entails gathering data from various sources such as spoken words, written texts, and observed behaviors of individuals within a specific context.
   b. Field Research
   Field research is a type of study that gathers information directly from research subjects, known as respondents and informants, through various data collection instruments such as observation, interviews, and other methods.
2. **Data collection technique**
   The data collection techniques utilized by the researcher in the preparation of this study include:
   a. Observation method
   The author conducted direct observations at the Faculty of Science and Technology and systematically recorded the observed phenomena.
   b. Interview method
   The author systematically gathered information or data using the method of oral question and answer, aligning with the research objectives.
   c. Literature Review Method
   The literature review is an activity involving learning, in-depth research, and citing theories or concepts from various types of literature such as books, journals, websites, or other writings related to the aspects being investigated.
3. **System Development Methods**
   The method utilized in this stage is the waterfall method, which typically involves a sequential process in system development. The stages in implementing the waterfall method include:
   a. Requirement Analysis
   The information gathering methods are carried out in various ways, including discussions, observations, surveys, interviews, and so on.
   b. System and Software Design
   The design phase is carried out with the aim of providing a complete picture of what needs to be done.
   c. Implementation and Unit Tasting
   The implementation and unit testing phase is the programming stage. In this phase, testing and verification of the functionality of the created modules are also carried out.
   d. Integration and System Testing
   After all units or modules have been developed and tested in the implementation phase, they are then integrated into the system as a whole.
   e. Operation and Maintenance

In the final stage of this method, the completed software is operated by users and undergoes maintenance.
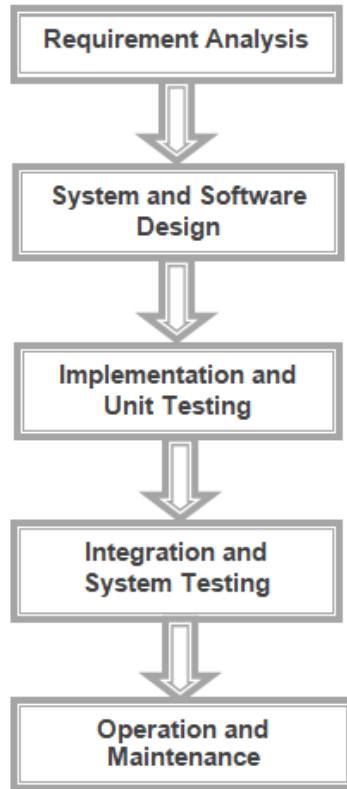

Figure 1. Waterfall Model

RESULTS AND ANALYSIS
Use Case Diagram
This diagram aids in understanding how users will interact with the system and illustrates the main features that the system must perform. Figure
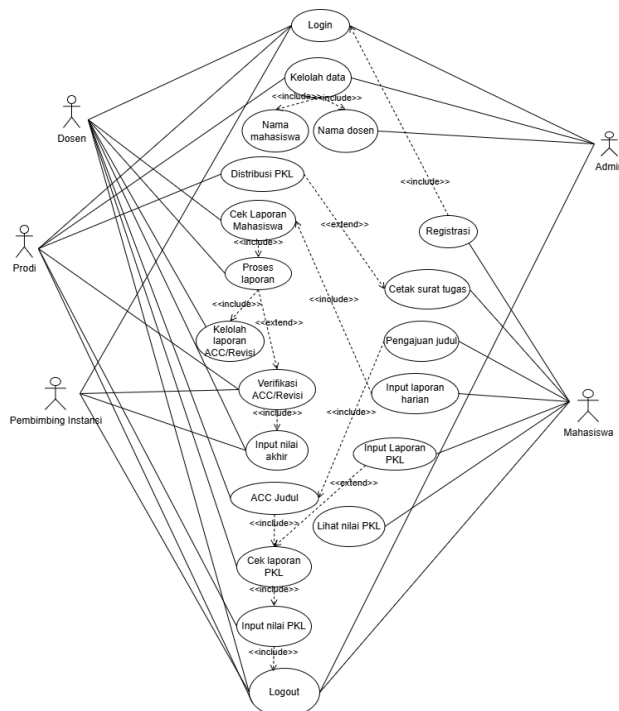

Figure 2. Use Case Diagram

Class Diagram

With this diagram, we can visualize the basic structure of the system and how these components are interconnected, such as what each component possesses, and how they interact with each other.
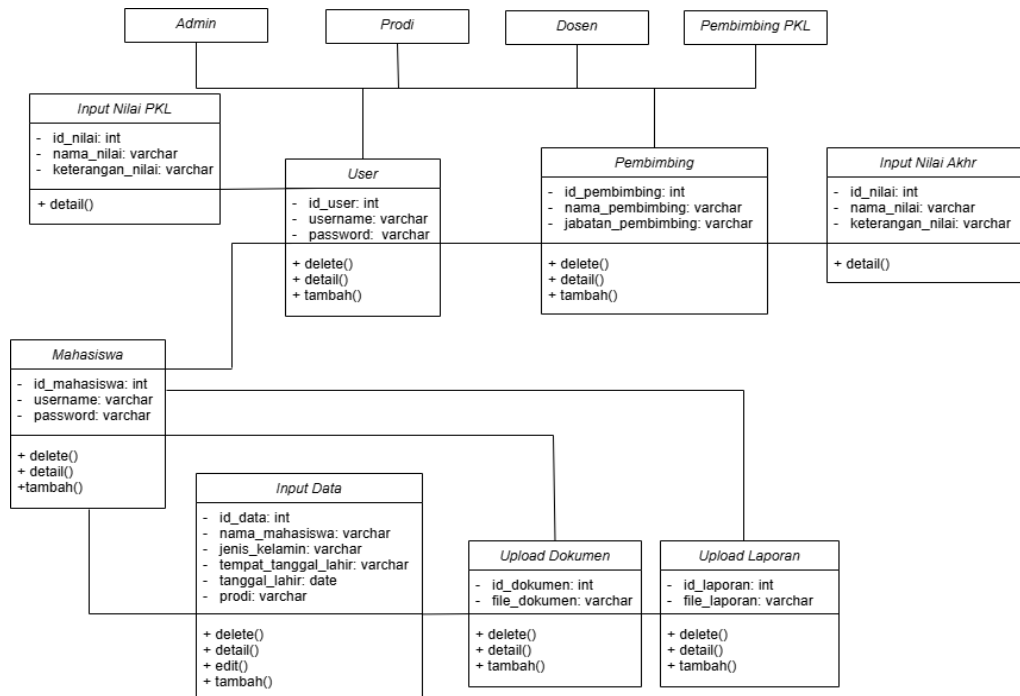
Figure 3. Class Diagram

Activity Diagram

By using symbols representing steps in a process, this diagram helps us understand the workflow sequence, decisions made, and how the process branches or loops.
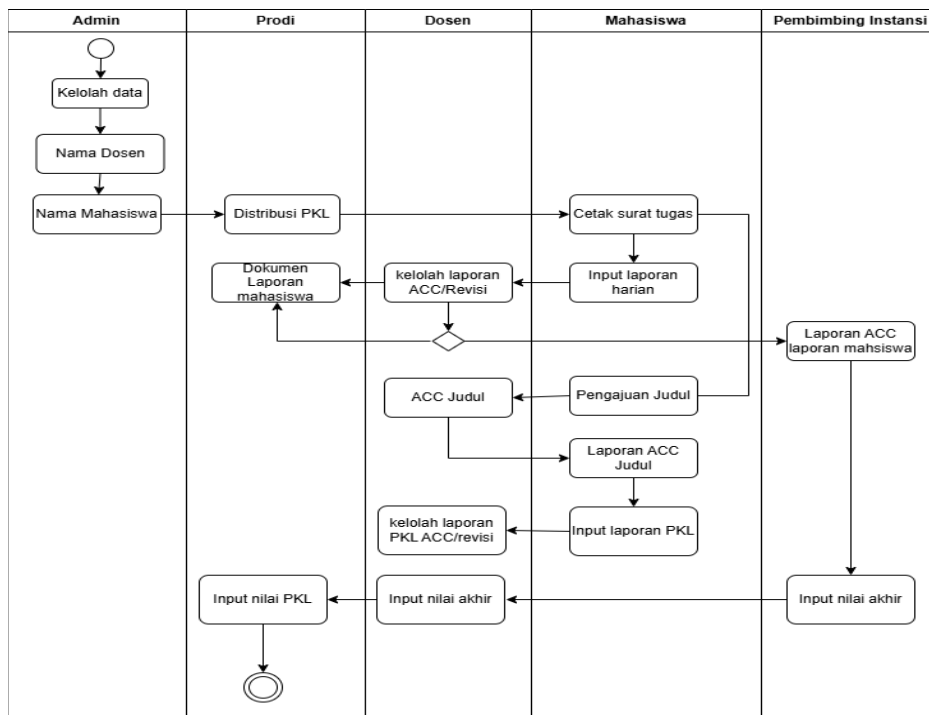
Figure 4. Activity Diagram

IMPLEMENTATION

This information system is designed with an initial login interface that requires the admin to enter a username and password located in the database. In addition to the admin, departments can also access the system by entering a username and password. There are also lecturers and students who can access the system by doing the same, as well as institutional supervisors.
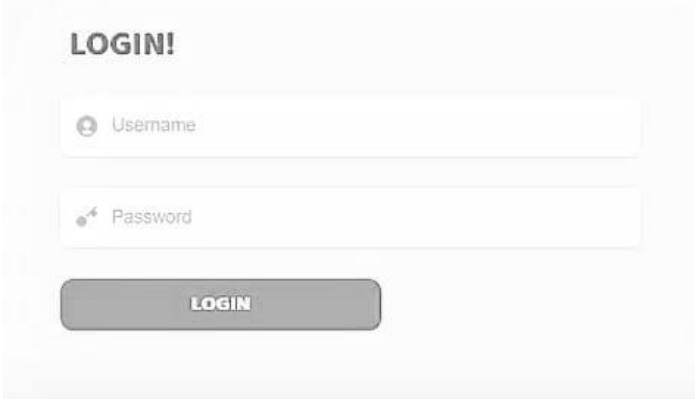
Figure 5. Login Page

On the admin dashboard, there is student data and lecturer data. The admin is responsible for managing the student and lecturer data to ensure its accuracy.
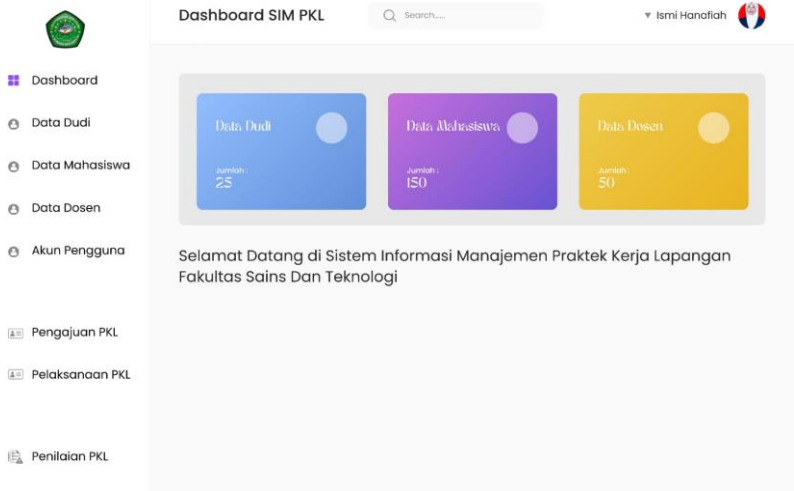
Figure 6. Dashboard Admin

Additionally, there is a program dashboard responsible for managing internship placements. The program can also view students' daily reports and student data.
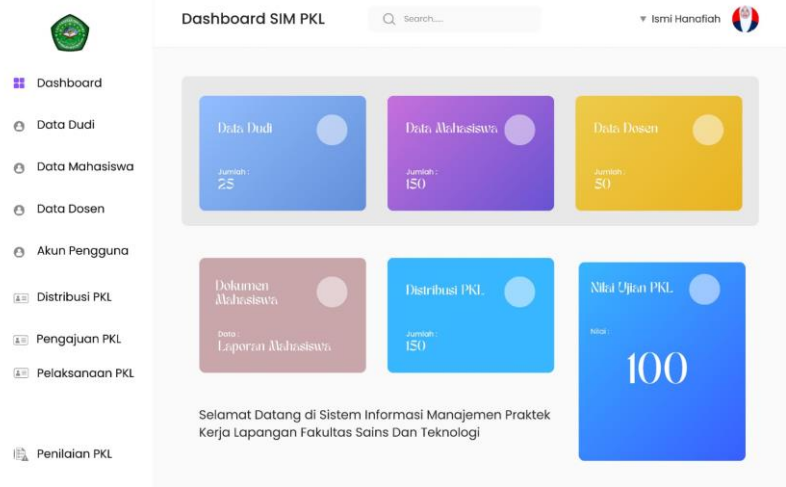
Figure 7. Dashboard Prodi

Additionally, there is a lecturer dashboard responsible for granting approvals to students. Lecturers can also view student activities through the daily reports uploaded by the students.
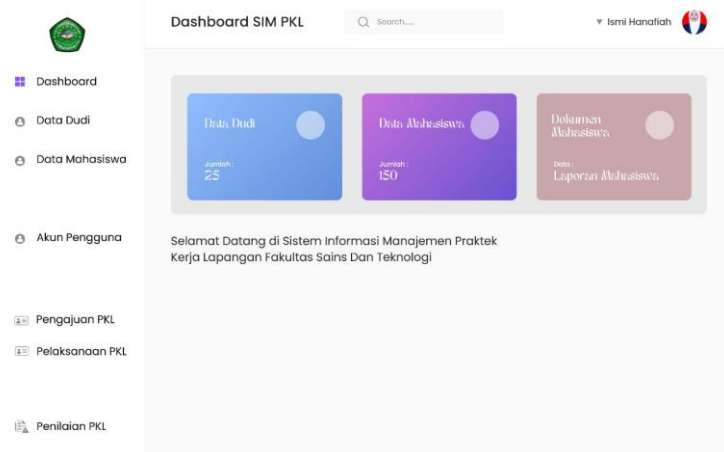

Figure 8. Lecturer Dashboard

Additionally, there is an institutional supervisor dashboard responsible for mentoring students during their internships at the institution and for evaluating students based on their daily reports.
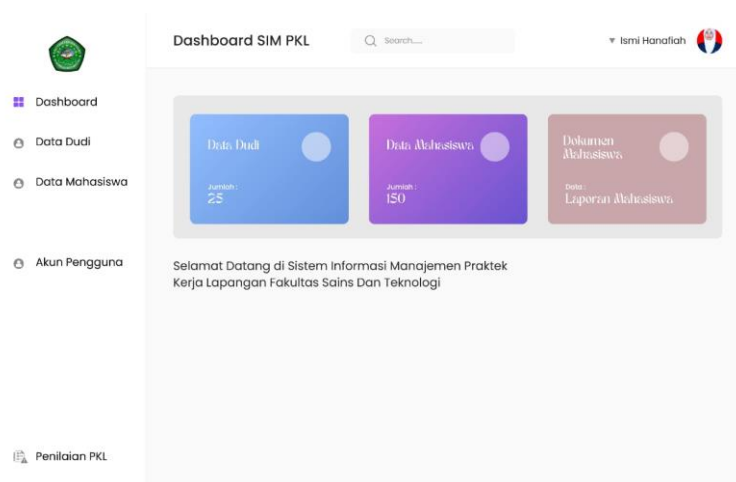

Figure 9. Institutional Supervisor Dashboard

Lastly, there is a student dashboard where students are required to actively submit daily reports and seek guidance from lecturers.
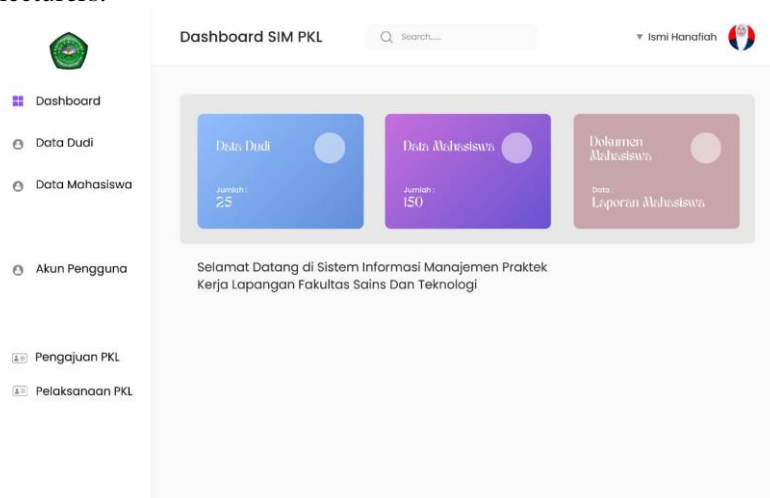

Figure 9. Dashboard Mahasiswa

Below is an example of the internship evaluation form that can be downloaded by students.

Figure 10. Internship Evaluation

CONCLUSION

This research aims to design and develop an internship management information system to generate internship final grade reports, enhance student participation, optimize coordination and information processes, and improve administrative quality.

ACKNOWLEDGEMENTS

CONFLICT OF INTEREST

Conflict of interest in the journal "Management Information System of Field Work Practice at the Faculty of Science and Technology" may arise if the authors have financial or personal relationships with organizations involved in the development or implementation of the system. Additionally, institutional or corporate affiliations could influence the authors' views on the strengths or weaknesses of the system. The possibility of academic or professional biases should also be considered, especially if the authors promote specific methodologies. The influence of funding sources could also introduce biases aligned with the expectations of the funders. It is important to clearly disclose these potential conflicts of interest to maintain the integrity and transparency of the research.

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