# Design of Internship Student Management Information System with Software Development Life Cycle Approach

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## Article Information

## A B S T R A C T

This research is motivated by the absence of an information system concerning the placement of student internships. This is attributed to the diverse backgrounds of students at the H. Agus Salim Institute of Technology and Business (ITB), comprising three different classes. For regular morning students, internship placements can be tailored to their field of study. However, for evening students (regular two) and weekend students (regular three), who are individuals already employed in government institutions and private companies, determining suitable internship locations becomes challenging. This is because the tasks performed in these institutions and companies may not align with the academic disciplines studied by the students during their academic tenure. In the design of this internship information system, the researcher adopts the Incremental model, which is one of the models in the Software Development Life Cycle (SDLC). Functional suitability testing, compatibility testing, usability testing, and validity testing were conducted on the internship management information system. The test results, carried out by one expert, yielded a functional suitability score of 94%, categorized as excellent. The capability test, also conducted by one expert, resulted in a score of 80%, categorized as very good. Usability testing, conducted by seven experts, yielded a score of 80.6%. Validity testing, carried out by three validators, resulted in a score of 0.86, categorized as highly valid.

## 1. Introduction

In facing the challenges arising in the era of globalization, it is crucial to emphasize that the fundamental foundation for the progress of a nation lies in its human resources. Human resources serve as the key, not only in terms of quantity but also quality. Therefore, the improvement and development of human resources must be carried out continuously.

In this context, H. Agus Salim Institute of Technology and Business in Bukittinggi plays a significant role. Through a holistic approach, this institution not only focuses on academic aspects but is also committed to shaping individuals into excellent human resources. With continuous efforts in improving the quality and developing human resources, the institute becomes a crucial support in aligning and perfecting the human resources structuring process. Consequently, the achievement of effective and efficient development goals can be better realized. The importance of focusing on human resource development is also reflected in the vision and mission of H. Agus Salim Institute of Technology and Business in Bukittinggi. Through an integrated and market-oriented educational approach, the institution strives to produce graduates who not only possess academic excellence but also practical skills relevant to the demands of the industrial world.

By prioritizing the improvement of the quality of education and teaching, this Institute plays a role as an institution that encourages innovation and research. Providing facilities and support for teaching staff and students is a crucial step in creating a dynamic and progressive academic environment.

Through its active role, H. Agus Salim Institute of Technology and Business in Bukittinggi has emerged as a pioneer in shaping individuals into adaptive, creative, and highly competitive human resources. Therefore, this institution not only contributes to individual development but also serves as an integral part of societal efforts towards achieving sustainable and positive development [1].

Internship is one of the mandatory courses for every student, and its implementation is carried out in government institutions or companies. One of the objectives of an internship is to apply specific skills and expertise directly in the working environment, aligned with the field of study. This is expected to enhance the understanding of the scope of the work field in accordance with one's competence [2].

The internship serves as an integral component within the educational framework at H. Agus Salim Institute of Technology and Business in Bukittinggi. As a mandatory course for every student, its implementation is designed to provide practical experience within government institutions or companies. In this context, the internship is not merely a formality; rather, it represents a valuable opportunity for students to apply the skills and knowledge acquired during their studies, specifically in alignment with their field of study.

The main objective of this internship program is to provide students with a profound understanding of the scope of the work field in accordance with their competence. By actively participating in the professional environment, students can confront real-world situations, develop practical skills, and expand their professional networks. Therefore, internship is not just a component of the curriculum; it serves as a tangible window into the professional world, assisting students in responding to future challenges with greater readiness and confidence.

Currently, we are facing challenges related to the placement of student internships at H. Agus Salim Institute of Technology and Business (ITB). One of the main issues is the lack of alignment between internship placements and the academic fields studied by the students. This challenge arises due to the absence of a clear information system regarding the placement of student internships. H. Agus Salim ITB has three different classes with diverse backgrounds: regular morning students, regular two classes for evening students, and regular three classes for weekend students, some of whom are already employed in government institutions or private companies.

Morning regular students may find it easier to align their internship placements with their academic field. However, for regular two and three classes, consisting of students who are already employed, finding suitable internship locations can be more challenging. This is due to the fact that their roles in government institutions or private companies may not always align with the disciplines they are studying. Additionally, there are other issues related to the determination of internship placements by the university, which can impact the students' presence at their workplaces. Therefore, steps are needed to enhance the internship placement information system to better align with the needs and fields of study of the students, taking into consideration the conditions and jobs already undertaken by working students.

And also the time for submitting internship reports is often late and does not match the predetermined schedule, because the internship schedule for each class is different in starting internship activities. Up until now, H. Agus Salim Institute of Technology and Business (ITB) continues to strive for improvement and keeps abreast of technological advancements related to information systems and networks. Information handling has predominantly been conducted manually, leading to frequent errors and delays in the dissemination of information.

Based on the preliminary survey conducted at H. Agus Salim Institute of Technology and Business (ITB) in Bukittinggi, participants in the internship program are seventh-semester students, with the number of

internship participants adjusted to the total number of students in each cohort. On average, the number of students participating in the internship program is over 100. The internship management information system is not yet functioning as it should, and there are still many shortcomings in monitoring the internship activities conducted by students.

This research is primarily focused on the management information system related to student internship activities. One common issue is the lack of monitoring of student internship activities by the university and supervising faculty members, resulting in suboptimal and less effective internship experiences. Furthermore, the determination of internship placements is left to the students, often leading to mismatches between their academic disciplines and the chosen internship locations.

Management Information System (MIS) is a system or process that provides the necessary information to manage organizational files effectively. MIS and the information it generates are generally considered essential components of prudence and reasonable business decisions [4].

The Management Information System (MIS) plays a crucial role in the context of student internship placements at H. Agus Salim Institute of Technology and Business (ITB). MIS not only provides the necessary information for managing organizational files effectively but also serves as a key instrument in enhancing internship placement efficiency and policies. MIS (Management Information System) and the information it generates are considered inseparable components of prudence and reasonable business decisions.

With a robust management information system in place, the campus can more easily determine internship placements that align with students' fields of study, identify relevant internship opportunities in line with industry developments, and ensure that students can apply their skills and knowledge effectively in a work environment. Additionally, the MIS can assist the campus and students in managing information related to internship requirements, schedules, and progress monitoring.

Therefore, the effective implementation of a Management Information System can provide a positive contribution in ensuring alignment between the fields of study and internship experiences. This enables students to optimize their benefits and be better prepared to face challenges in the professional world.

According to Soetedjo Moeljodihardjo, Management Information System is defined as a method that generates timely information for management regarding the external environment and internal operations of an organization. The goal is to support decision-making in order to improve planning and control [5]. According to Komarudin, Management Information System is an information system that enables organizational leaders to obtain information with the appropriate quantity and quality for use in the decision-making process [6].

## 2. Method

The type of research utilized is Research and Development (R&D). Research and Development is a process intended to create new technology or enhance existing elements to provide a competitive advantage in the industry, business, or at the national level [7].

In this research, the researcher employs a system development model adopted from the System Development Life Cycle. SDLC is a traditional method used for building, maintaining, and replacing information systems [8]. The Software Development Life Cycle, often referred to as the System Development Life Cycle (SDLC), is the process of developing or modifying a software system using models and methodologies employed by individuals to develop previous software systems [9].

## 3. Results and Discussion

### 3.1. Opening Stage

#### 3.1.1. Requirement

Seeking the requirements necessary for designing the internship student management information system at the H. Agus Salim Institute of Technology and Business (ITB) Bukittinggi, and identifying the needs of the system users. Several prerequisites must be addressed before designing a system that the researcher will create. In the phase of designing the internship student management information system at the H. Agus Salim Institute of Technology and Business (ITB) Bukittinggi, it is essential to prepare all requirements for designing the internship information system. The first step is to gather information regarding the requirements related to the internship implementation process at the H. Agus Salim Institute of Technology and Business (ITB) Bukittinggi. Currently, the internship activities conducted by the Institute of Technology and Business (ITB) H. Agus Salim Bukittinggi are manually executed. Students submit internship placement plans to the internship organizing committee by filling out a manual internship registration form. Subsequently, the committee manually selects and records all participants who will undertake the internship.

To gather further information, the researcher also conducted interviews with several students to understand the implementation process of internships at the H. Agus Salim Institute of Technology and Business (ITB) Bukittinggi. The conclusion drawn from these interviews is that a common issue is a mismatch between the internship placement and the student's field of study due to the absence of an information system regarding the placement of student internships. This is attributed to the fact that students at the H. Agus Salim Institute of Technology and Business (ITB) come from three different classes with distinct backgrounds. For regular morning class students, internship placements can be aligned with their field of study. However, for the afternoon class (regular two) and weekend class (regular three) students, who are often already employed in government institutions or private companies, determining suitable internship locations becomes challenging. This is because their work responsibilities may not align with the academic disciplines studied during their college courses. Another issue is that if the internship placement is determined by the university, it may impact the student's attendance at their workplaces. Additionally, the submission of internship reports often faces delays and does not align with the predetermined schedule, as each class has a different start date for internship activities.

#### 3.1.2. Spesification System

In the specification phase, the researcher determines the specifications for the internship management information system by using the analysis results from the requirement phase as a reference [10]. Based on the conducted analysis, the specifications for the internship management information system at the H. Agus Salim Institute of Technology and Business (ITB) Bukittinggi are outlined as follows: (a) The internship management information system is designed using the PHP programming language, with its database implemented using MySQL; (b) The system will be utilized by administrative users, internship supervising faculty members, internship placement providers, and student interns; (c) The system will allocate, place, and select supervising faculty members for students applying for internships; (d) Administrative users will input data for internship placements and supervising faculty members; (e) Student internship data will be obtained through the completion of an internship registration form by students participating in the internship program; and (f) Features within the internship management information system application include student registration form, adding internship placement data, adding supervising faculty member data, uploading student internship reports, internship student evaluation form, and printing internship student evaluations.

### 3.1.3. Architecture Design

In this phase, the planned design is implemented based on the problem analysis stages previously presented [11]. In this design stage, the researcher utilizes system design tools such as system flowcharts that illustrate the scheduling process flow and Unified Modeling Language (UML).

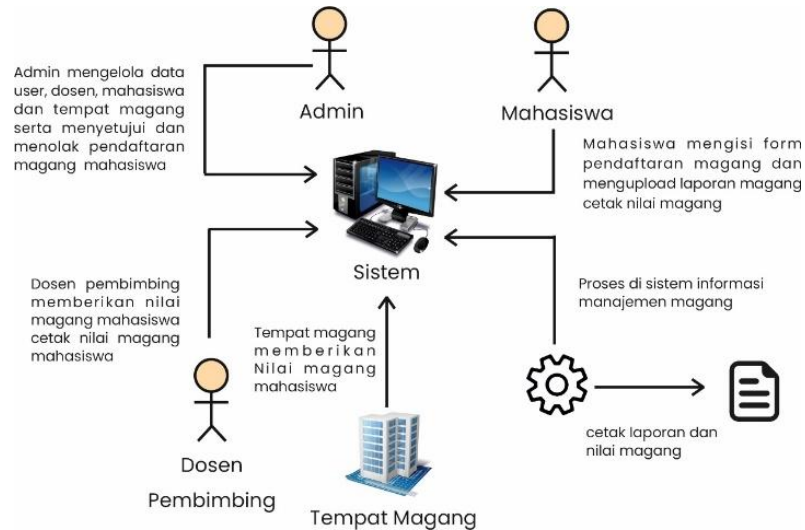Figure 1 is flowchart/process flow of internship management information system.



**Figure 1. Flow Process System**

UML is a language that visualizes, describes and documents software [12]. In this study, researchers used 4 diagrams from UML, namely: use case diagram, activity diagram, class diagram, and sequence diagram.

### 3.2. First Increment Stage

### 3.2.1. Analysis Stage

This stage involves analyzing the system requirements that will be designed [13]. Before designing the system, analysis is necessary. The goal of this analysis is to assess the importance of the system to be designed and identify the elements needed in the process of designing the internship student management information system at the H. Agus Salim Institute of Technology and Business (ITB) Bukittinggi. This allows for the depiction of the necessary components for designing the internship student management information system at the H. Agus Salim Institute of Technology and Business (ITB) Bukittinggi. During this stage, the researcher conducts interviews with students. Currently, a common issue is that internship placements do not align with the student's fields of study due to the absence of an information system regarding student internship placements. This is because students at the H. Agus Salim Institute of Technology and Business (ITB) come from three different classes with distinct backgrounds. For regular morning class students, internship placements can be aligned with their field of study. However, for the afternoon class (regular two) and weekend class (regular three) students, who are often already employed in government institutions or private companies, determining suitable internship locations becomes challenging. This is because their work responsibilities may not align with the academic disciplines studied during their college courses.

Another issue is that if the internship placement is determined by the university, it may impact the student's attendance at their workplaces. Additionally, the submission of internship reports often faces delays and does not align with the predetermined schedule, as each class has a different start date for internship activities. Before designing an application, an analysis of defining requirements is necessary to determine what is needed in the process of designing the internship student management information system at the H. Agus Salim Institute of Technology and Business (ITB) Bukittinggi.

### 3.2.2. Design Stage

This stage involves designing the internship management information system using PHP/MySQL. In this design, the researcher employs the Unified Modeling Language (UML) as a system design tool. UML is a language that visualizes, illustrates, and documents software. In this study, the researcher utilizes four UML diagrams: use case diagram, activity diagram, class diagram, and sequence diagram.
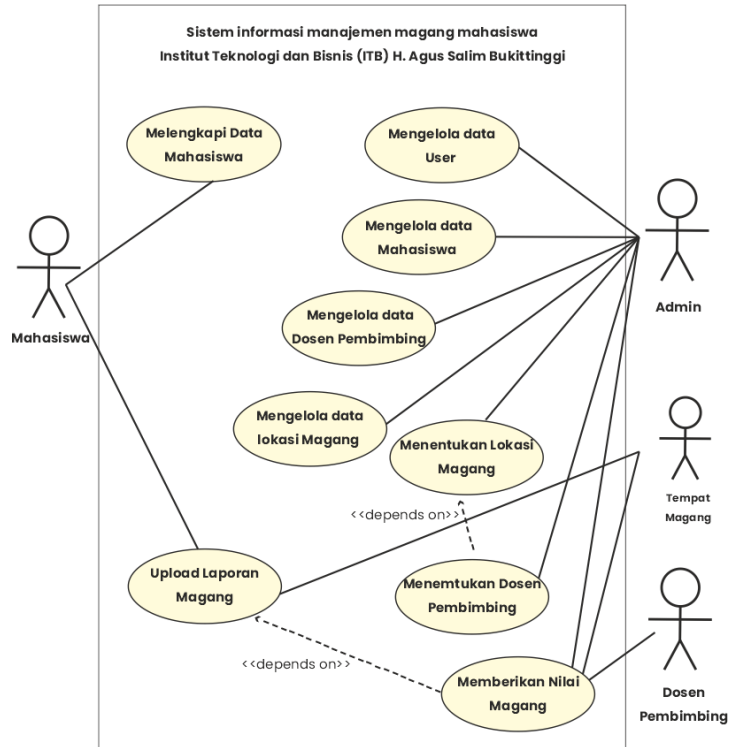
Figure 2 is a use case diagram.



**Figure 2. Use Case Diagram**

Figure 3, Figure 4, Figure 5, and Figure 6 are activity diagram.
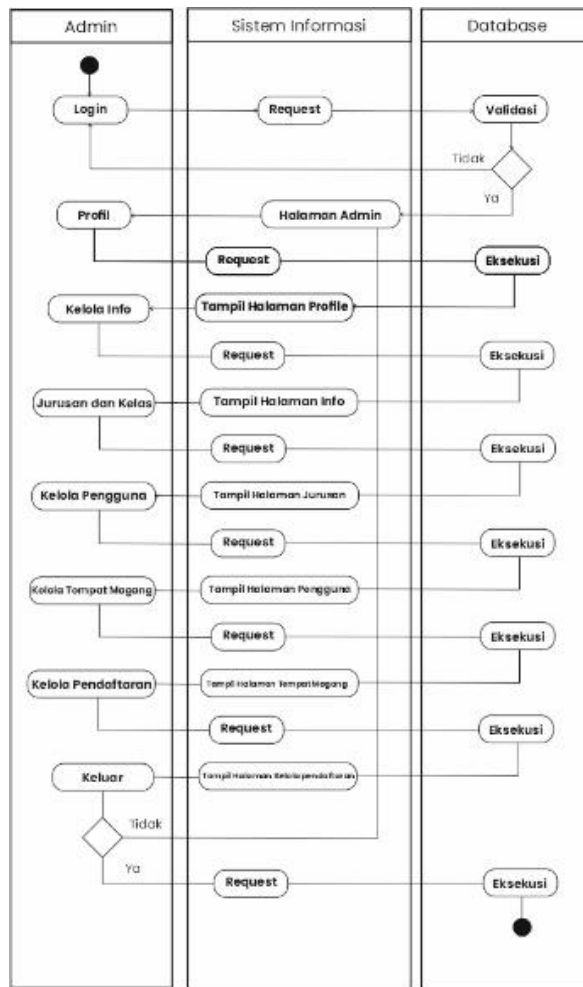
**Figure 3. Admin Activity Diagram**
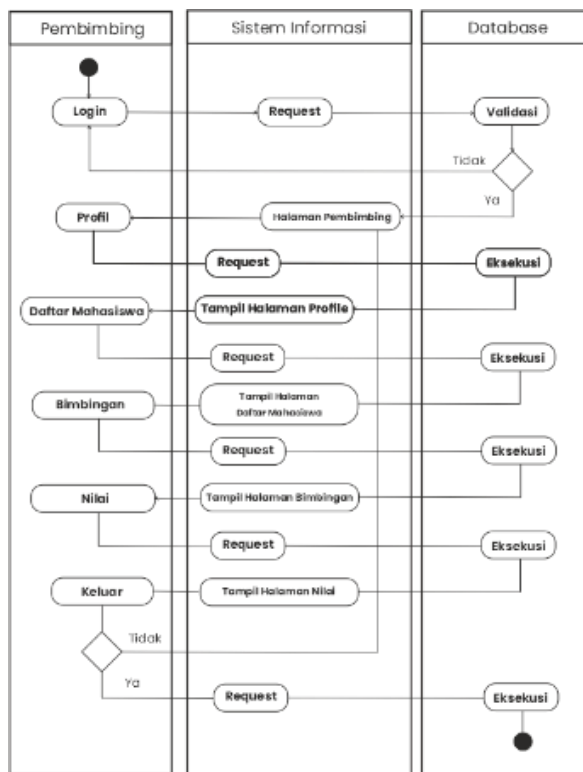


**Figure 4. Supervisor Activity Diagram**
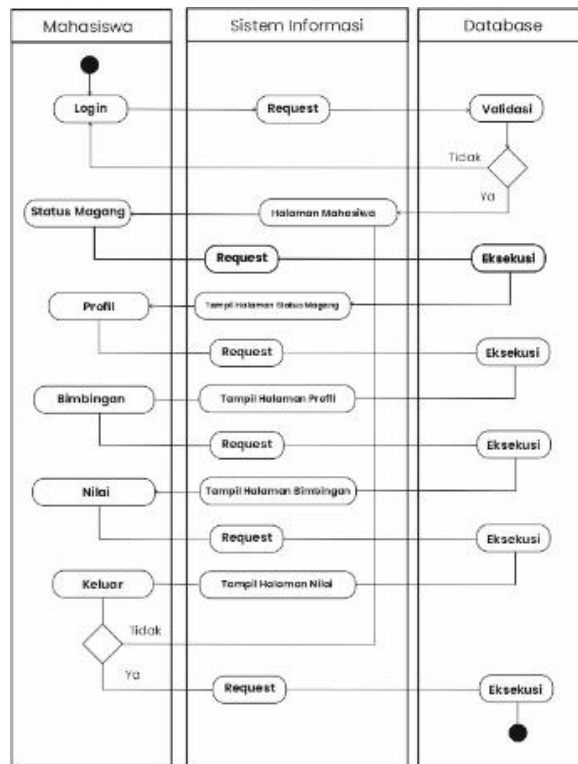
**Figure 5. Student Activity Diagram**
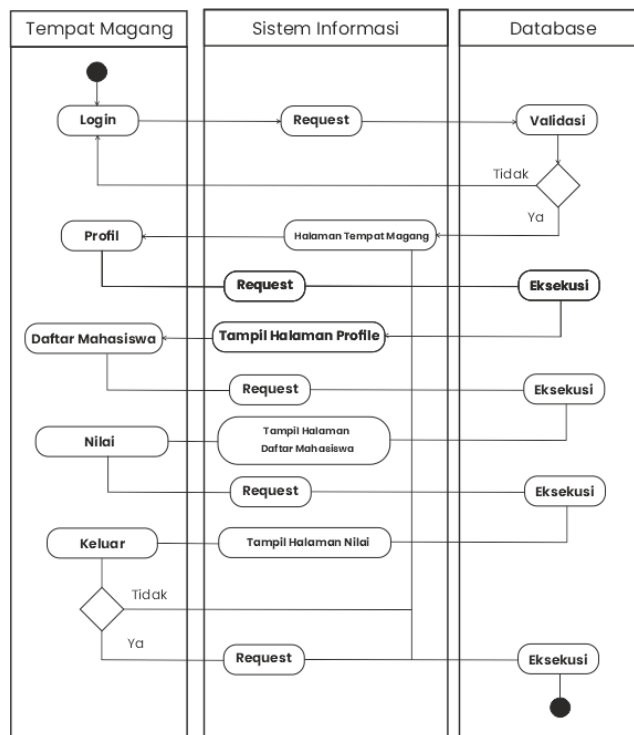


**Figure 6. Activity Diagram of Internship Place**

Figure 7, Figure 8, Figure 9, and Figure 10 are sequence diagram.
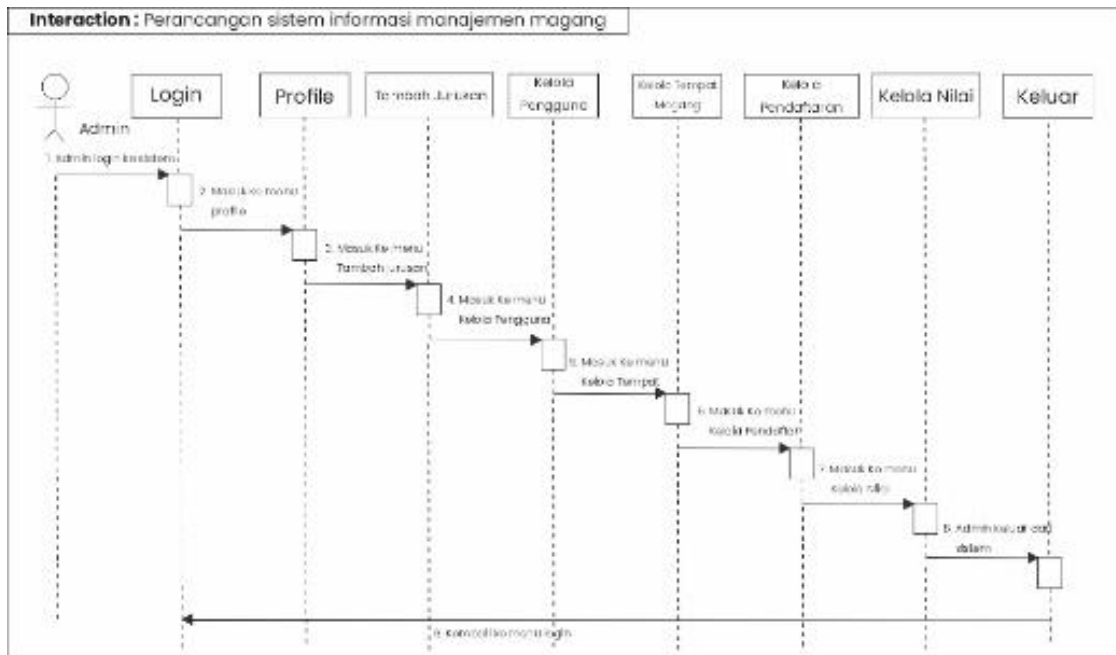
**Figure 7. Admin Sequence Diagram**
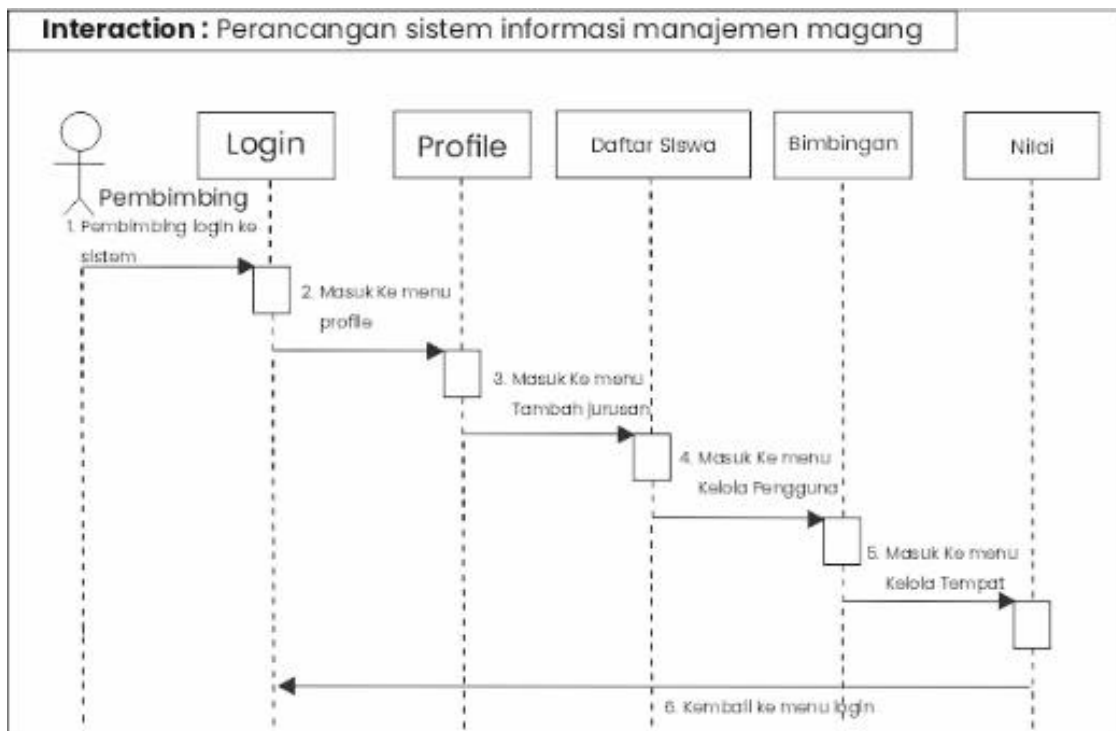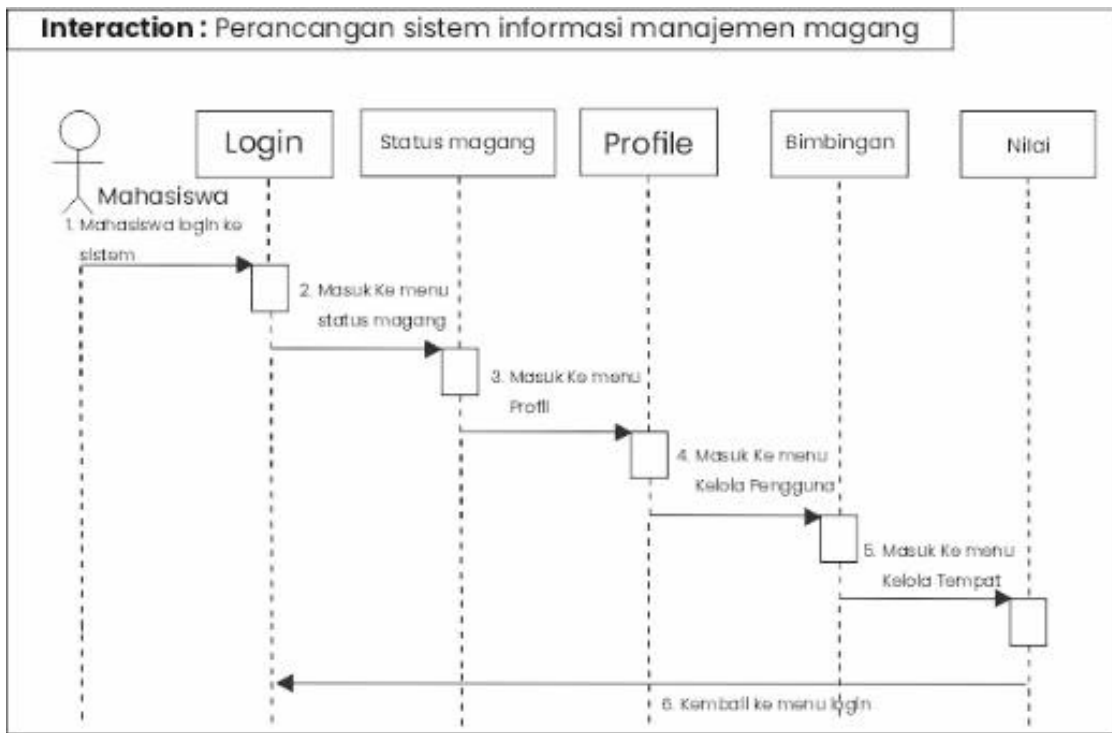


**Figure 8. Guiding Sequence Diagram**

**Figure 9. Student Sequence Diagram**
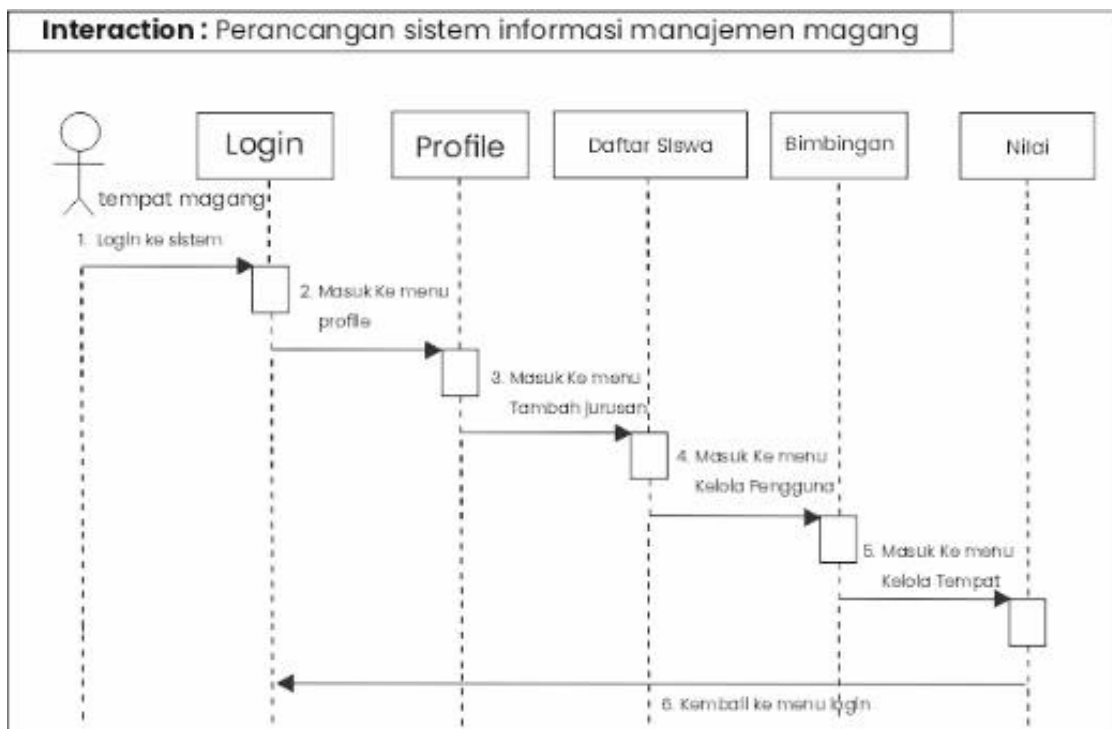


**Figure 10. Sequence Diagram of Internship Locations**
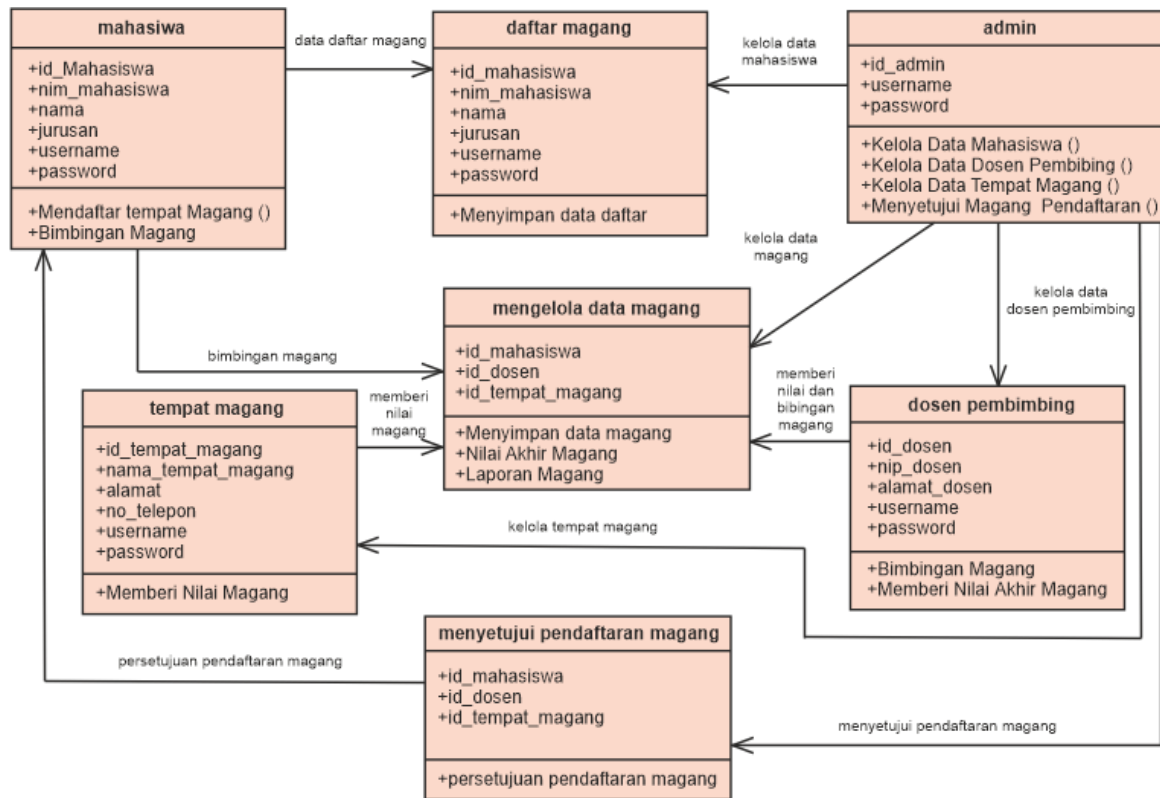
Figure 11 is a class diagram.

**Figure 11. Class Diagram**

## 3.3. Second Increment Stage

After completing the opening stage, the researcher then follows the flow of stages for each increment. In the first increment stage, there were several improvements. Therefore, in the second increment stage, adjustments were made based on the feedback from the first increment, specifically focusing on refining the design of the internship management information system.

### 3.3.1. Analysis Stage

Software and hardware preparations for designing the internship student management information system at the H. Agus Salim Institute of Technology and Business (ITB) Bukittinggi are essential in program requirement analysis. Software preparations include selecting the programming language and other supporting applications needed. Hardware preparations involve ensuring that the computer or laptop supports the software used for designing the system. For designing the internship management information system at the H. Agus Salim Institute of Technology and Business (ITB) Bukittinggi, the researcher utilizes Windows 10 as the operating system on the laptop, Visual Studio Code (VSCode) as the code editor, and Xampp and MySQL for database design. In terms of hardware, the researcher uses a laptop with an Intel Core i3 processor and 4GB of RAM.

Issues identified in this study include internship placements not aligning with students' fields of study due to the absence of an information system on student internship placements. This is attributed to the diverse backgrounds of students at the H. Agus Salim Institute of Technology and Business (ITB), comprising three different classes. For regular morning class students, internship placements can be aligned with their field of study. However, for the afternoon class (regular two) and weekend class (regular three) students, who are often already employed in government institutions or private companies, determining suitable internship locations becomes challenging. This is because their work responsibilities may not align with the academic disciplines studied during their college courses. Another issue is that if the university determines the internship placement, it may impact the students' attendance at their workplaces.

### 3.3.2. *Design Stage*
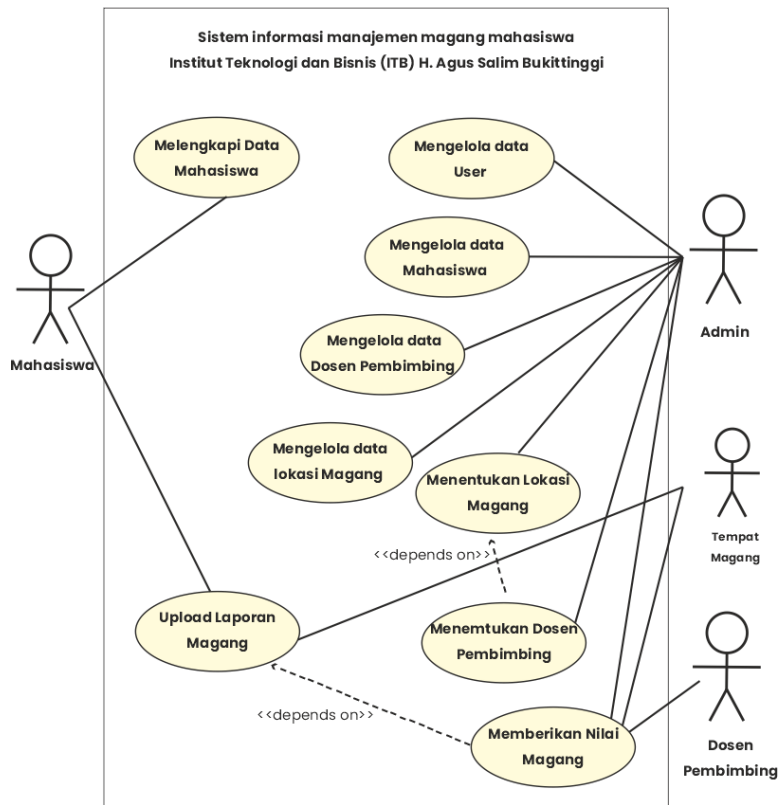
Figure 12 is a use case diagram.



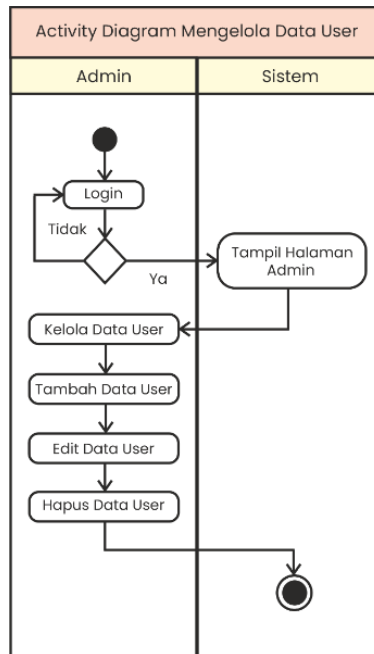**Figure 12. Use Case Diagram**

Figure 13 is an activity diagram.



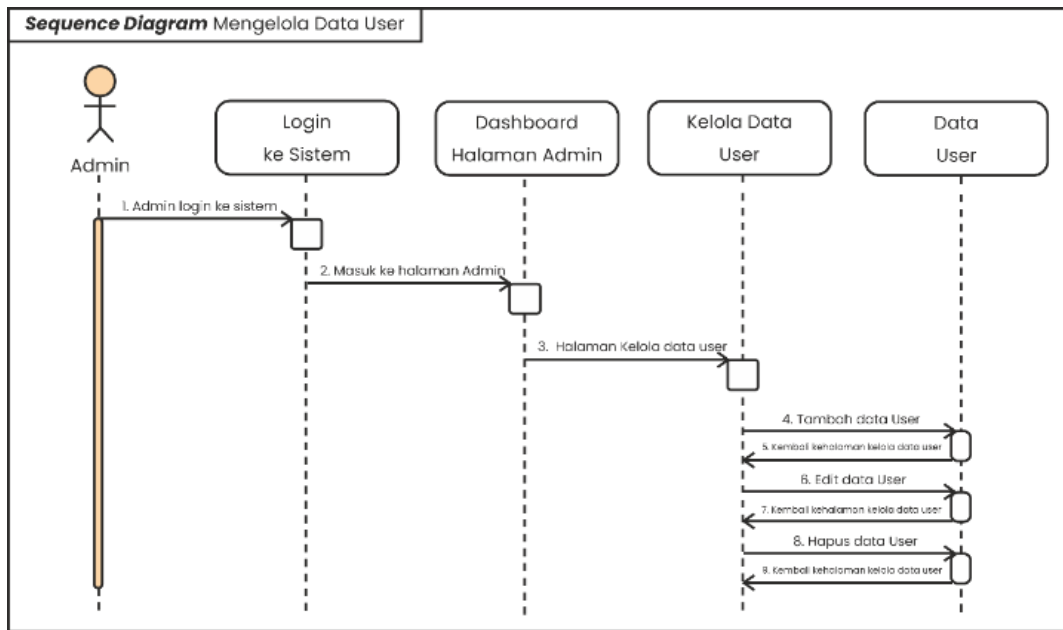**Figure 13. User Activity Diagram**

Figure 14 is a sequence diagram.

Indah Naurah Fakhira et.al, *Design of Internship Student Management…*

**Figure 14. User Sequence Diagram**

Figure 15 is a class diagram.
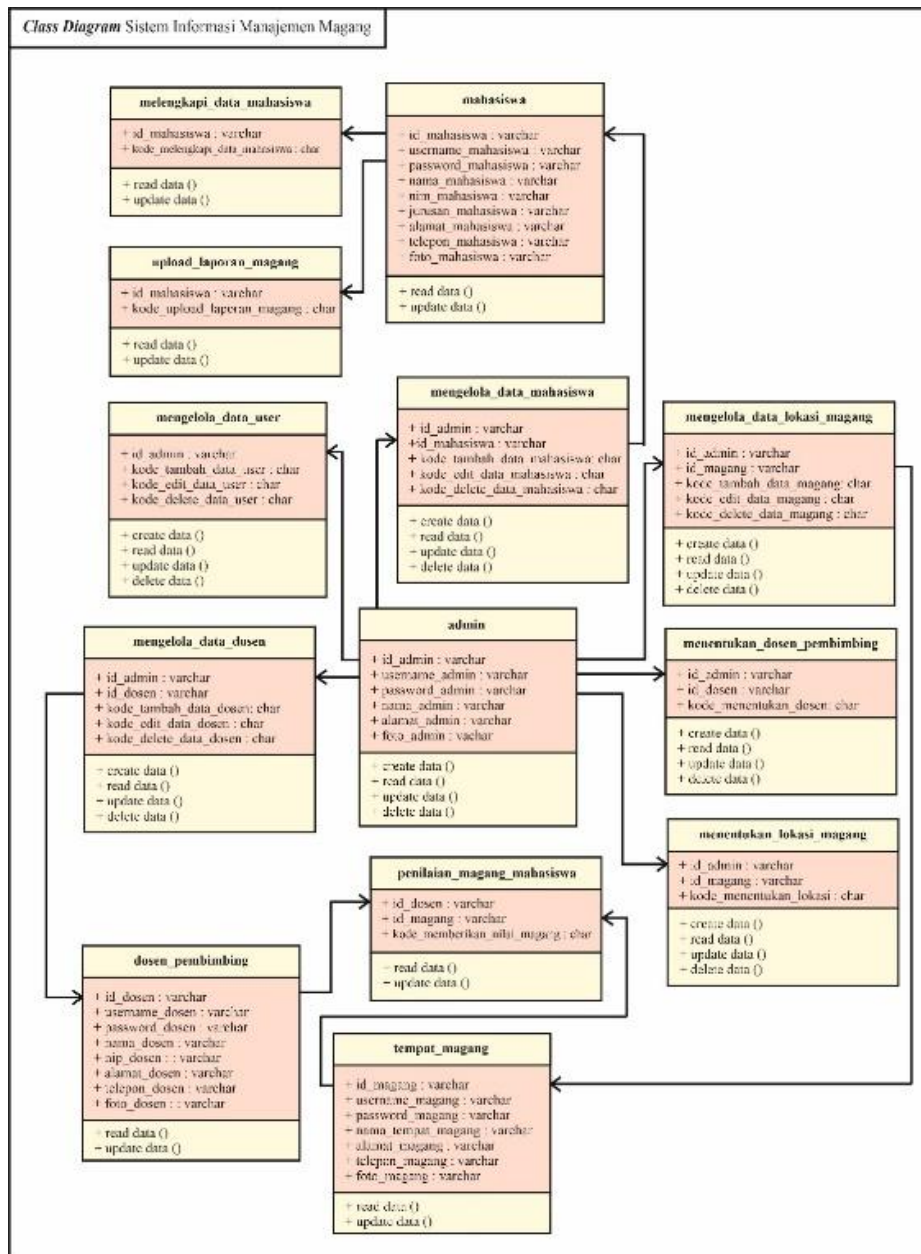
**Figure 15. Class Diagram**

### 3.3.3. Design Results

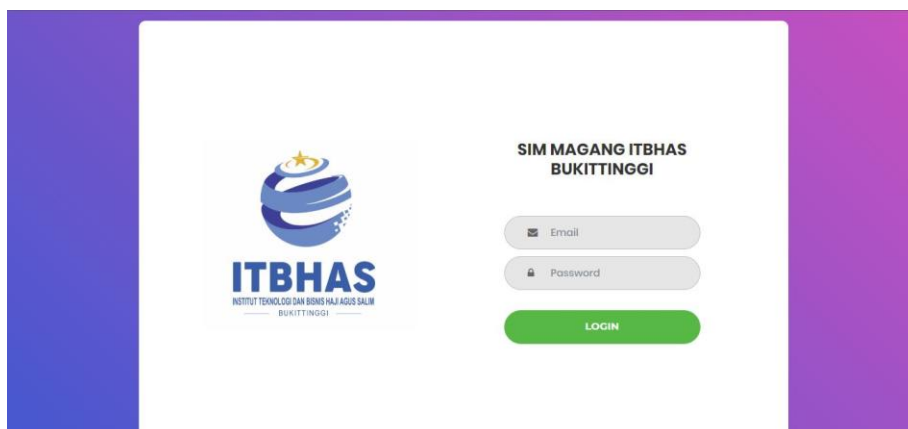Figure 16 is the login page.



**Figure 16. Login Page**
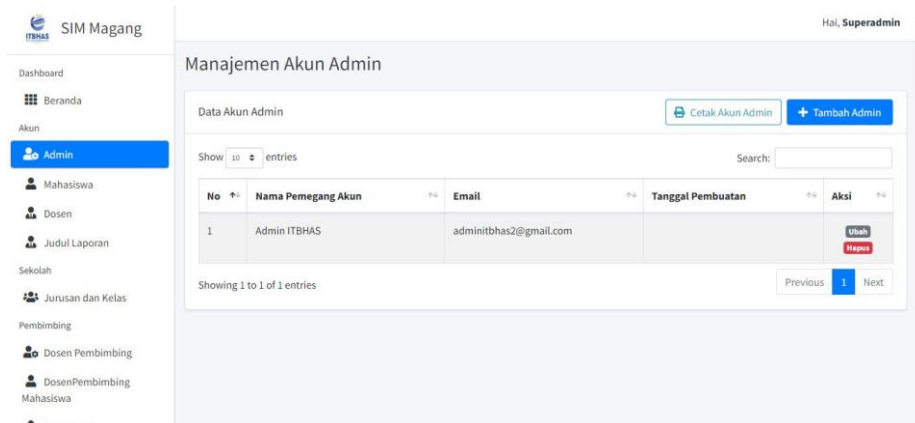
Figure 17 is the admin dashboard page.



**Figure 17. Admin Dashboard Page**

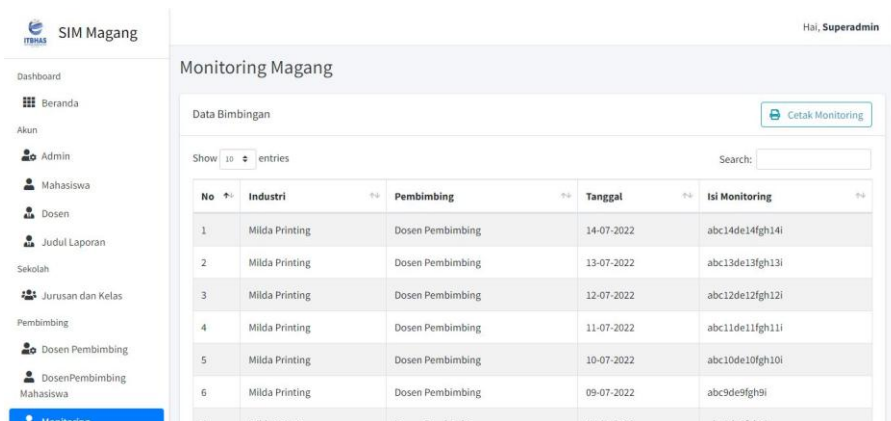Figure 18 is the internship monitoring page.



**Figure 18. Internship Monitoring Page**

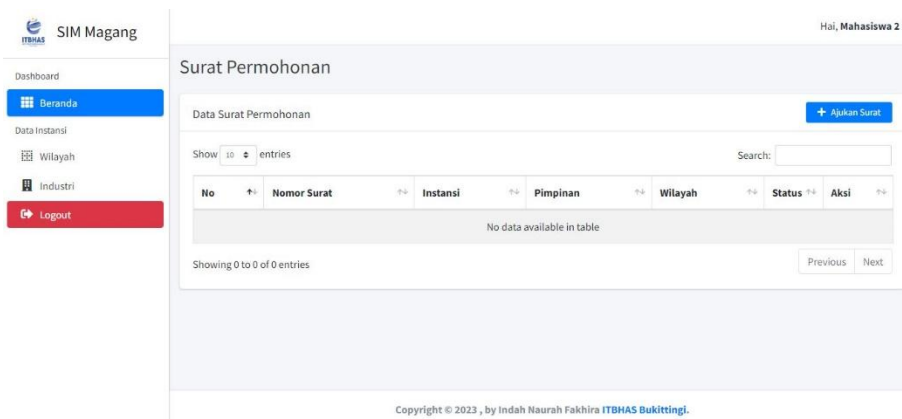Figure 19 is the student dashboard page.



**Figure 19. Student Dashboard Page**

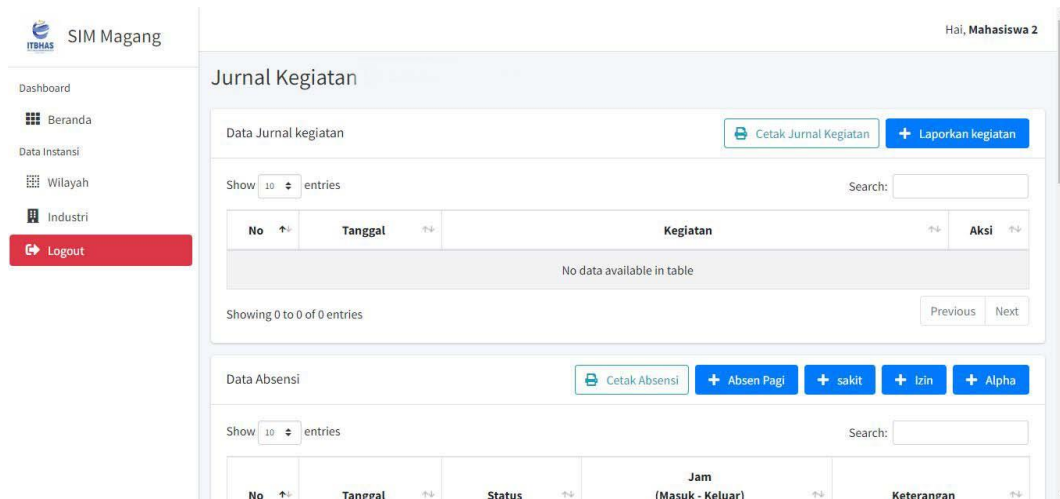Figure 20 is the internship journal input page, making internship reports and taking student internship absences.

**Figure 20. Student Account Management**

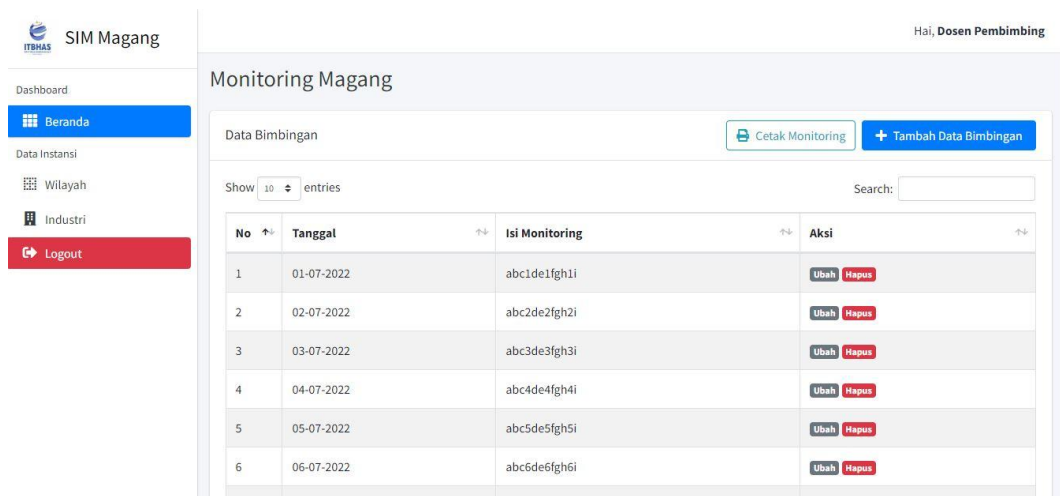Figure 21 is the lecturer account management page.



**Figure 21. Lecturer Account**

The output, in general, represents the results of a process that can be presented in the form of reports. Subsequently, the reports generated have a capacity that depends on the information needs. With the presence of instructions, the computer will produce processed data output to a medium such as a printer. The purpose of output design is to comprehend and understand everything related to the output format and generate outputs that are effective and comprehensible.

This page is intended for user input. Users enter their username and password to access the system. If the credentials are valid, the system will redirect to respective pages based on the access rights, which serve as the main menu. In case of invalid credentials, the user will be prompted to re-enter the correct username and password.

The coding stage involves constructing the information system using the PHP programming language. In this phase, the researcher engages in the coding process. The programming software utilized is Visual Studio Code, supplemented by database software, namely MySQL.

Testing is the phase of evaluating the completed information system. After the program undergoes testing, if any errors are identified, the program will be corrected. If the information system is error-free, the program will be implemented directly in the field.

In this internship management information system, tests for functional suitability, compatibility, usability, and validity were conducted. The results of the product testing carried out by the author obtained

a functional suitability test with one expert, yielding a score of 94%, categorized as excellent. The compatibility test, conducted by one expert, resulted in a score of 80%, also categorized as excellent. The usability test, involving seven experts, achieved a score of 80.6%. The validity test, conducted by three validators, obtained a score of 0.86, categorized as highly valid.

## 4. Conclusion

The outcome of this research is a internship management information system at ITBHAS Bukittinggi, which can be utilized by students to apply for internships and by the internship committee for monitoring the internship process. It is anticipated that the implementation of this internship management information system will facilitate students, as well as faculty members and internship committees, in executing all internship activities more efficiently.

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