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Design and Build an Internship Information System at PT. Perkebunan Nusantara IV Regional I Medan Web Based

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Abstract

The administrative process for the internship program at PT Perkebunan Nusantara IV Regional I Medan is still carried out conventionally, starting from the registration stage to recording attendance and daily journals. This situation causes various problems such as input errors, delays in the verification process, and difficulties in monitoring the attendance and activities of interns. This study aims to design a web-based internship information system as a solution to improve data management efficiency and reduce existing administrative problems. The method used in this study follows the SDLC approach with the Waterfall model, which includes needs analysis, system design, implementation with Laravel and Tailwind CSS, and testing using the Black Box Testing method. The findings of this study indicate that the developed system can support online registration, location-based attendance, daily journal filling, and participant management by the admin more quickly, accurately, and integrated. Testing shows that all main functions operate according to the specified scenario. This system makes a significant contribution to supporting more efficient and up-to-date internship administration and has the potential for further development to improve the quality of internship services at related institutions

Keywords: *Internship Information System, Web-Based Application, Laravel Framework, UML, SDLC Waterfall, Tailwind CSS.*

1. Introduction

Various organizations have decided to digitize their operating processes, one of which is the management of internship programs, due to the advancement of information technology [1]. PT Perkebunan Nusantara IV (PTPN IV) Region I Medan accepts interns from various educational institutions every year. However, the internship administration process such as registration, attendance, and filling out the daily journal is still done manually[2]. This manual recording often leads to a variety of issues, such as input errors, delayed verification processes, scattered data, and difficulty tracking intern attendance and progress. This condition shows how important an information system can help manage internships effectively and integrated.[3].

One of the strategic solutions to overcome this problem is the use of web technology [4]. The web-based internship information system allows the registration process to be done online, allows participants to fill out daily attendance and journals online, and related parties can manage data more quickly, accurately, and documented[5].

Previous studies on administrative digitization have shown that web-based systems can improve the efficiency of service processes, reduce record-keeping errors, and speed up user access to information [6]. However, most current research focuses on only one function, such as the registration or attendance system, and has not integrated the entire internship administration process into one integrated platform [7].

With the entire system built using the Software Development Life Cycle (SDLC) approach of the Waterfall model, this study aims to design and develop a web-based internship information system at PTPN IV Regional I Medan[8]. It is hoped that this system will simplify the internship administration process, reduce the barriers caused by manual record-keeping, and provide a faster, faster, and clearer service experience for participants [9].

2. Research Method

This research method begins with the collection of information through three main approaches: interviews with the section responsible for the internship to understand the administrative path and feature needs; direct observation of the registration and attendance process which is still carried out manually; literature study. The data is then analyzed to identify system requirements, which include functional requirements such as online registration, digital attendance recording, and participant daily journaling, as well as non-functional requirements such as access security, user-friendly interface, and consistent system performance. The system development process follows the SDLC Waterfall model, but is explained in a simpler way: it starts with understanding the needs, design system interfaces and flows, build applications using Laravel and Tailwind, and then test each feature before the system is ready to use. Testing is done using the Black

Box Testing method, which emphasizes on whether each function performs according to the usage scenario without checking the internal logic of the program.

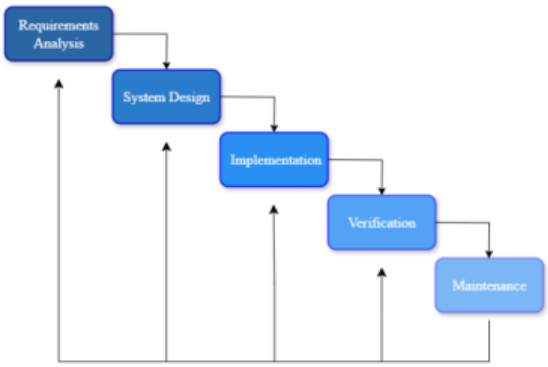

Fig. 1: Flow Model Waterfall

Figure 1 shows the flow of the development of the system with the Waterfall model. There are five stages that are the reference of the Waterfall model, namely Requirements Analysis, System Design, Implementation, Verification, and Maintenance.

3. Result and Discussion

3.1. Requirements Analysis

This stage is carried out by analyzing needs to find out what stakeholders or participants need. This method of collecting data on needs is carried out by direct observation on the spot, interviews with related parties, and literature studies to ensure that the needs of needs, whether functional or non-functional, are recorded perfectly. For the foundation of the system design to be built, this data is very important, so that the system built meets the expectations of potential system users.

3.2. System Design

3.2.1. Use Case Diagram

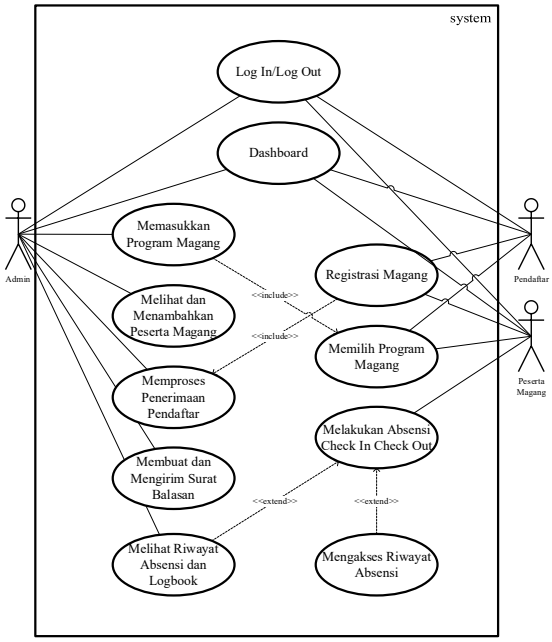

Fig. 2: Use Case Diagram Information Systems Internship

Figure 2 above is a Use Case Diagram of the system to be built. In the picture above, there are three actors, namely Admin, Registrant, and Intern. The three actors can both log in to their systems, and can have their own dashboards. Admins have access to the input of the internship program, view and can add interns by processing the acceptance of applicants, creating and sending letters via email, and can view the history of attendance and logbooks or daily journals of the interns. As for Registrants, they can have a little access, namely internship registration and can choose the internship program that they want to register in the system when they are logged in using the account sent via the registered email.

Meanwhile, the intern is the status of the latest version of the registrant status, because when the admin has validated the submitted registration, the system will automatically open more access to registrants whose status is already an intern. such as being able to do check-in/check-out attendance, view attendance history, and be able to fill in the logbook at the same time as daily attendance.

3.2.2. Activity Diagram

Activity Diagram is a type of UML diagram that functions to visualize the sequence of activities in a system[10]. This diagram is a development of the Use Case that describes the flow of activities and information in the system to support the development of the system in a more structured manner.

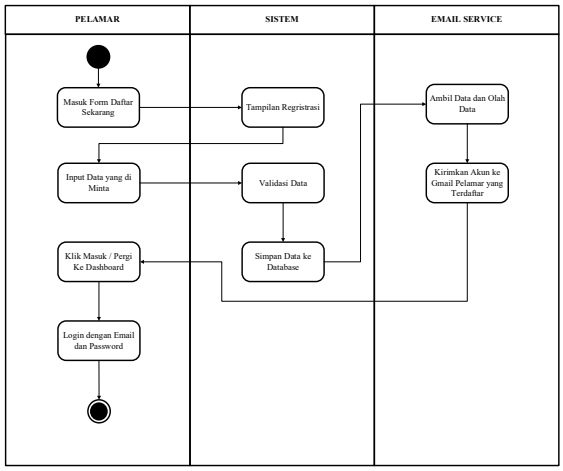

Fig. 3: Activity Diagram of Registration or Registration of Interns

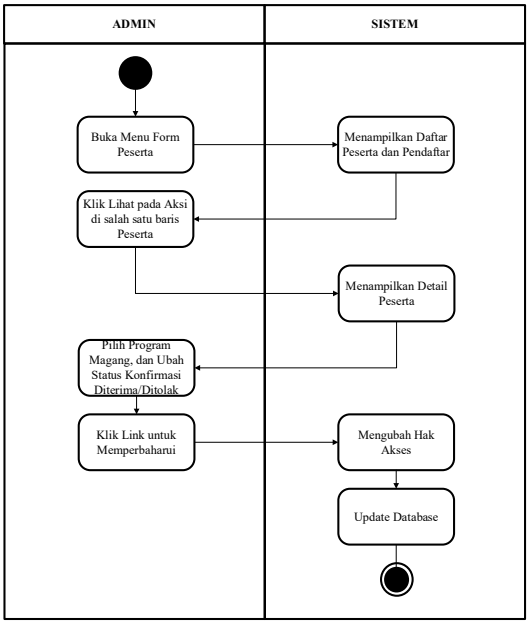

Fig. 4: Activity Diagram Processing Applicant Admission

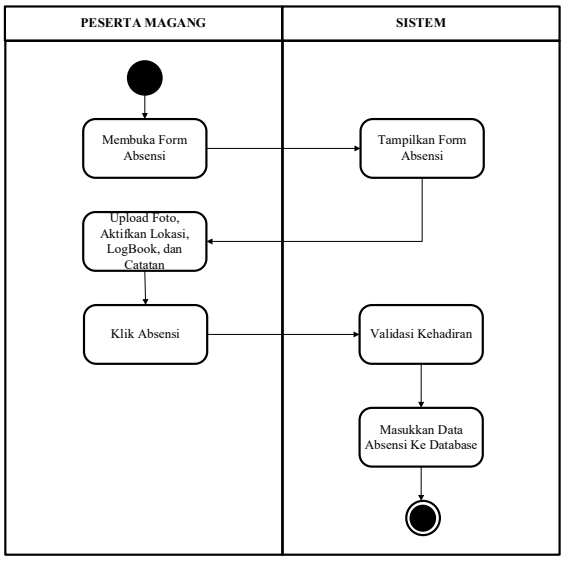

Fig. 5: Activity Diagram Doing Daily Check-In/Check-Out Attendance

3.2.3. Sequence Diagram

A sequence diagram is a diagram that presents the interaction and communication between various objects and describes the sequence of procedures or processes carried out to achieve a certain goal[11]. For example, from logging in to generating the necessary reports or outputs so as to provide a clear understanding of the communication flow and behavior of objects in and around the system.

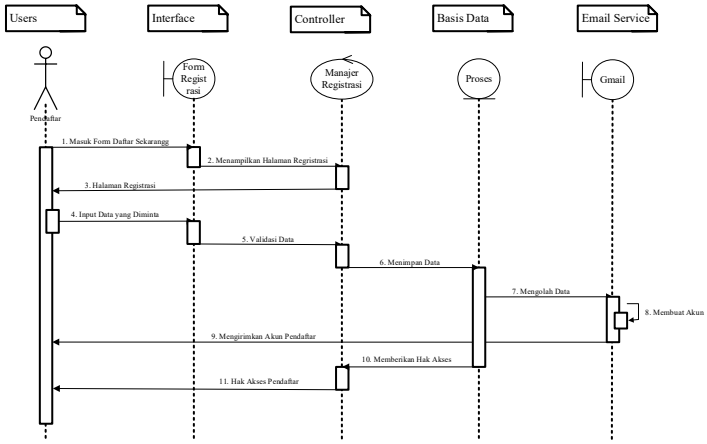

Fig. 6: Sequence Diagram of Registration or Registration of Interns

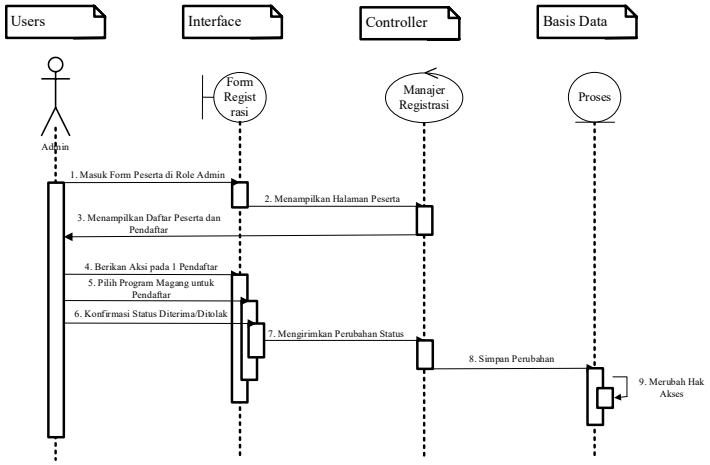

Fig. 7: Sequence Diagram Processing Applicant Acceptance

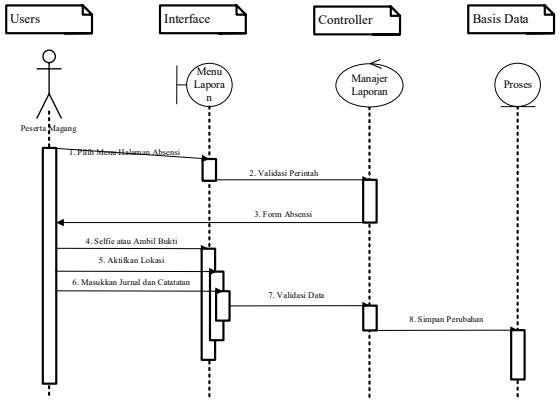

Fig. 8: Sequence Diagram of Doing Daily Check-In/Check-Out Attendance

3.2.4. Class Diagram

Class Diagram is a type of UML diagram that serves to describe the structure of the system by displaying existing classes, attributes, methods, and relationships between classes[12]. These diagrams play a role in modeling the critical elements of the system and how each class interacts, thus supporting the software design and development process.

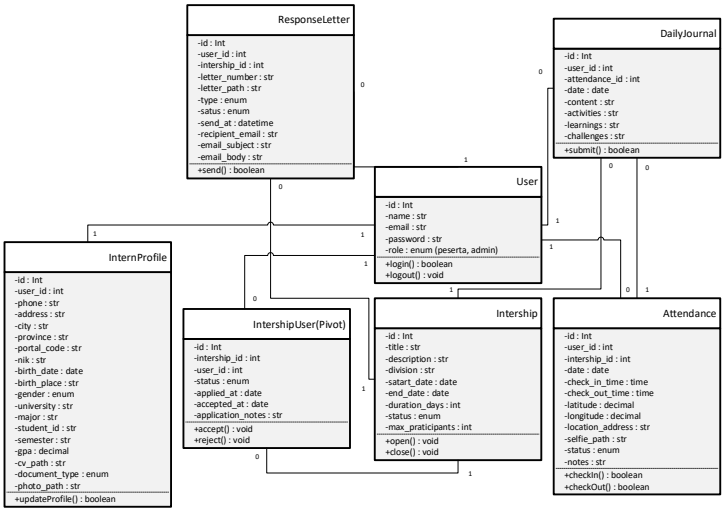

Fig. 9: Class Internship Information System Diagram

Figure 9 shows a class diagram and there are user classes, attendance, internships, interns, internship profiles, daily journals, and reply letters.

3.3. Implementation

This implementation is the application of a system that has passed the analysis stage and also the design stage[13]. This website is designed to make it easier for registrants and related parties in matters related to internship programs.

Fig. 10: System Index Page

The page above presents a brief overview that correlates with the internship program.

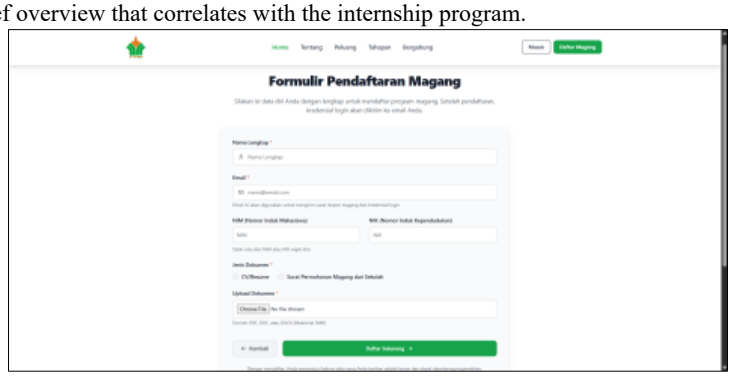

Fig. 11: Internship Registration Page

Figure 11 refers to the internship registration form that must be completed and filled out by prospective interns.

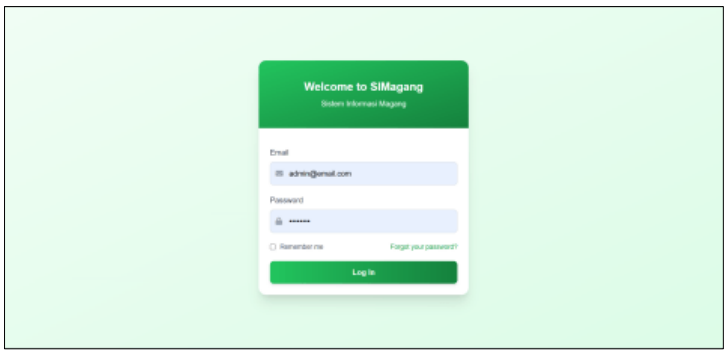

Fig. 12: Login Page

The image shows the interface used by the user to log in/login to the system with the account that has been given.

Fig. 13: Admin Dashboard Page

Figure 13 shows a page that provides brief information on the number of registrants, active interns, available divisions, and documents, as well as a list of registrants and interns.

Fig. 14: Internship Program Page

Figure 14 shows a page that presents a list of available internship programs, and admins can also add available internship programs in PTPN IV Regional I Medan.

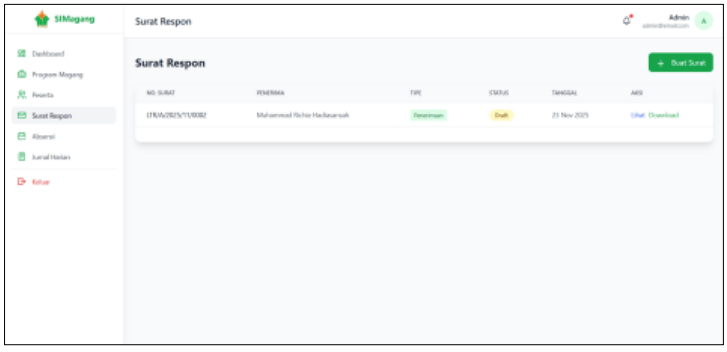

Fig. 15: Reply Letter Page

The image above depicts the response letter page or replies letter for interns. Admins can create a reply letter and send it directly to the gmail registered in the letter.

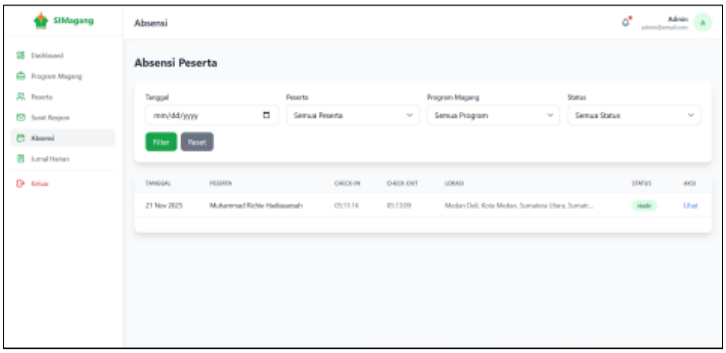

Fig. 16: Internship Participant Attendance Page

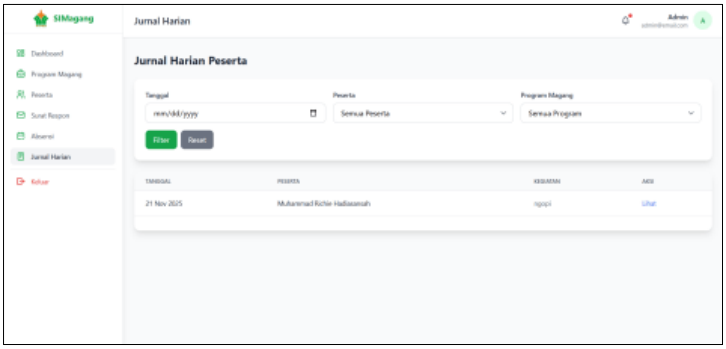

Fig. 17: Intern Daily Journal Page

The two images above show that the admin can see the attendance that has been made by the intern, whether it is check-in or check-out. As well as being able to see the activities of the interns or the daily journals of the interns.

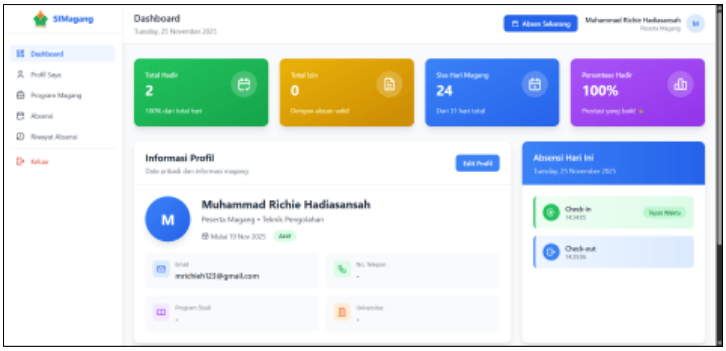

Fig. 18: Intern Dashboard Page

Interns can view their attendance information during the internship, total permits, countdown of internship days or remaining internship days, as well as attendance percentages during internships. On the dashboard, participants can also make attendance directly without having to go to the attendance menu, and can directly access the edit profile.

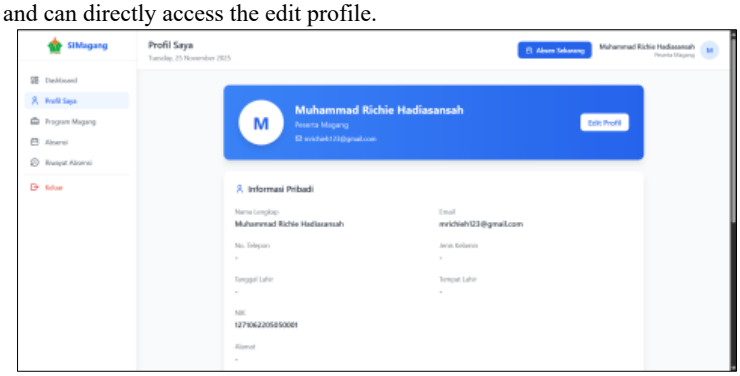

Fig. 19: Profile Page

Figure 19 presents a profile page where interns can view and edit profiles, view documents entered at the time of registration, and can change the password of the intern's account.

Fig. 20: Internship Program Page

The internship program page presents a list of internship programs that we have registered for while we are still in the status of an applicant, and a list of other internship programs that we have not registered.

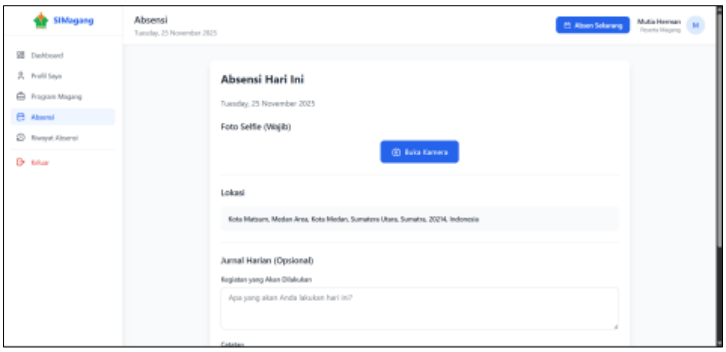

Fig. 21: Internship Check-In Attendance Page

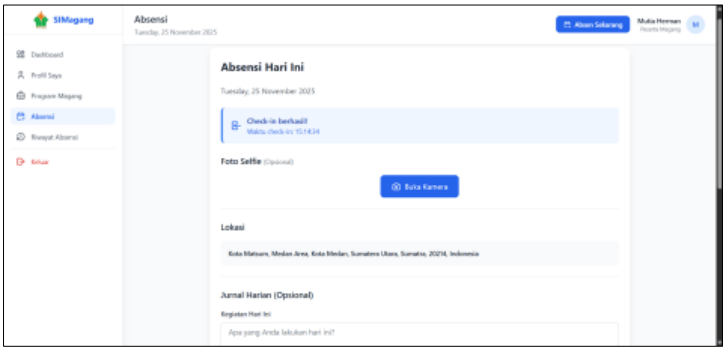

Fig. 22: Internship Participant Check-Out Attendance Page

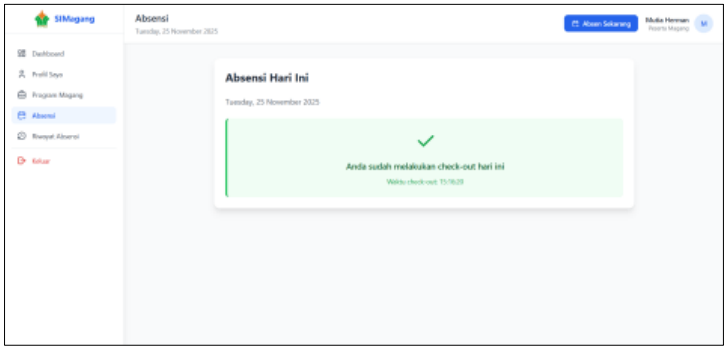

Fig. 23: Post-Attendance Page

The image above refers to the intern's attendance page. Interns can do check-in and check-out attendance by taking a photo/photo of themselves as evidence, and activate the location so that it can be detected by the system that the intern is at the internship location. Interns can also add a daily journal of the activities to be carried out.

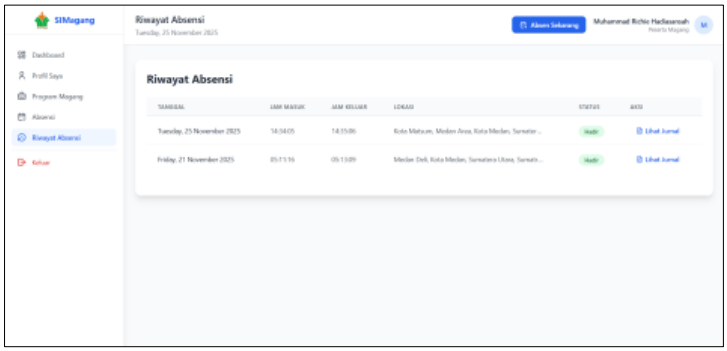

Fig. 24: Attendance History Page

Attendance history during the internship is displayed on the page above, namely the Attendance history page, we can also see the daily journal that has been filled out every day.

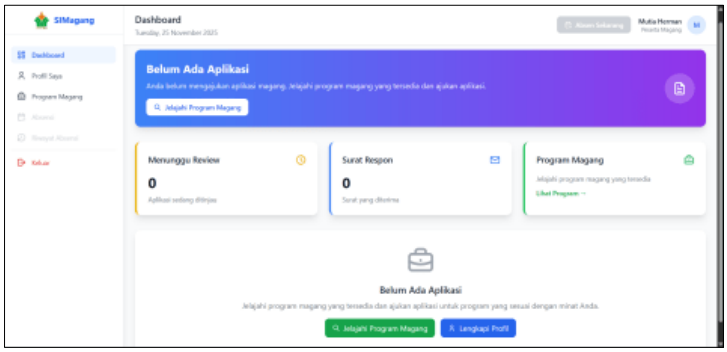

Fig. 25: Registrant Dashboard Page

The registrant's dashboard page displays the contents of the dashboard page of users who are still in the status of Registrant/their internship registration application has not been accepted by the admin. Applicants can directly access the internship program to choose and register, as well as directly access the profile page and can edit it.

Fig. 26: Registrant Internship Program Page

On the internship program page, the user can choose the internship program we want to participate in and can also see the details, but the admin can also choose our internship program for the applicant.

3.4. Verification

The test will be carried out using Blackbox Testing on the internship information system website. This test is carried out with the aim of adjusting the input and output of the system without having to look at the structure of the system program code one by one.

Table 1: Blackbox Internship Information System Test Results

No.	Modul	Test Case	Expected Results	Test Results
1.	Log In / Log Out	Enter the correct username and password	Login to the dashboard	✅
2.	Log In / Log Out	Click logout	Return to the index page	✅
3.	Dashboard	Login	Dashboard displayed	✅
4.	Dashboard	Direct URL access	Redirect to login	✅
5.	Admin – Internship Program	Fill in all fields	Stored data	✅
6.	Admin – Internship Program	Clear field	Validation error appears	✅
7.	Admin – Participants	Access menu	Featured list	✅

8.	Admin – Participants	Fill out the form	Stored data	✅
9.	Internship Registration	Full Content	Successful registration	✅
10.	Internship Registration	Empty field	Validation appears	✅
11.	Choosing a Program	Access menu	List of fetured programs	✅
12.	Attendance	Clik check-in	Saved check-in	✅
13.	Attendance	Clik check-out	Saved check-out	✅
14.	Admin - Attendance History	Access menu	Data displayed	✅
15.	Admin – Logbook	Access menu	Logbook displayed	✅
16.	Admin – Sending a Response Letter	Fill out the form	Send email	✅
17.	Account Email Automatically Sent	Complete the registration stage	Accounts Automatically Sent to Registered Accounts	✅

3.5. Maintenance

System maintenance is carried out after the system is implemented to keep the system operating properly[14]. In this phase, the team makes adjustments and fixes to various issues that arise, as well as adding or improving features according to user needs. Maintenance activities can include performance improvements, bug fixes, and the development of new features to keep the system relevant and optimal in its use.

4. Conclusion

This research succeeded in creating a web-based internship information system to support the internship administration process at PTPN IV Regional I Medan. This system includes online registration features, location-based attendance, daily journal filling, and participant management by admins. The use of Laravel and Tailwind CSS in implementation demonstrates its effectiveness in producing a structured, responsive, and easy-to-use system. The test results with the Black Box Testing method show that all functions run according to the predetermined scenario, so this system is feasible to implement.

This system has a number of advantages, such as increased speed in the administrative process, accuracy in data logging, and more organized and accessible documentation. This digitization process also reduces the risk of errors in manual recording and helps related parties in monitoring the activities of interns more efficiently. However, the study also found some limitations, such as reliance on internet connections and the need to improve security aspects for longer uses.

Future system development can be done by adding real-time notification features to speed up information delivery, creating an analytics dashboard to make it easier to monitor participant performance, and automating internship assessments. In addition, optimizing system performance is also important in order to handle more users and ensure operational stability in the long term.

Acknowledgement

Future system development can be done by adding real-time notification features to speed up information delivery, creating an analytics dashboard to make it easier to monitor participant performance, and automating internship assessments. In addition, optimizing system performance is also important in order to handle more users and ensure operational stability in the long term.

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