DEVELOPMENT A WEB-BASED STUDENT INTERNSHIP APPLICATION USING LARAVEL FRAMEWORK & WATERFALL MODEL

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Abstract--In this research, the author will discuss the development of a student internship information system implemented using the Laravel framework. The aim is to provide convenience for students in registering/applying for internships, reporting daily activities, submitting final reports, and updating all other internship-related information, as well as facilitating institutions in managing internship data. The method used in this research is the waterfall method, which includes literature review, needs analysis, system design, implementation, testing, and evaluation. The Laravel framework was chosen because of its good performance, ease of use, and many features that can facilitate the development of information systems. The student internship management information system designed has easy-to-use internship registration and reporting features that can be accessed from anywhere, as well as integrated internship data management features. The results of this research show that the development of a student internship information system using the Laravel framework can provide convenience in registering and reporting internship results for students, as well as help institutions in managing internship data. It is hoped that with the existence of this student internship information system, it can be a solution to simplify and accelerate the internship process and management for students and participating institutions.

Keywords: internship; information system; Laravel; web.

I. INTRODUCTION

Internship is one of the mandatory learning methods at the Politeknik Enjinering Indorama, which aims to increase practical experience and apply theories learned in the classroom to the industries[1]. Internship also provides opportunities for students to develop skills and networks that can be useful in the future.

However, in the process, the management of internships, starting from registration to student reporting, is often perceived as ineffective and inefficient because students must meet with the internship coordinator, fill out registration forms, and collect the required documents. Similarly, in the process of reporting and registering the internship results presentation, students must return to the internship coordinator on campus and complete all requirements manually without using a system. Then the next problem arises from the internship management side, which has difficulties in managing internship data, such as managing registration data, validating documents, monitoring internship activities, assessing student interns, and reporting internship results. All of these activities are carried out conventionally by managing physical files that have the risk of being lost, misplaced, and difficult to find quickly when needed. In addition, these files will also take up space for storage, so the longer the files are collected, the more space is needed.

Based on these problems, there is a need to create a student internship information system that can facilitate students in registering and reporting all internship activities and assist institutions or internship managers in managing internship data effectively and efficiently. Therefore, in this article, the development of a web-based student internship information system using the Laravel framework will be discussed. The Laravel framework was chosen because it has good performance, is easy to use, and has many features that can facilitate information system development [2]–[4]. The method used in this research is the SDLC method, starting from literature study, needs analysis, system design, testing, and evaluation [5]. It is hoped that the student internship information system developed in this research can provide ease for students and internship managers, making the process more

effective and efficient.

The following are some previous studies related to the topic to be studied, among others: conducted by Ayu Vanesa and Elfi Tasrif about the Design of Internship Information System for Students at Higher Education Service Agency (LLDIKTI) in Region X. This article discusses the development of an information system to facilitate LLDikti in Region X in receiving and managing internship data for students. The information system was developed using PHP language, MySQL, and Code Igniter Framework, with the prototype method to design the system. The information system developed by the researchers can help in managing student internships by sending online letters, online student internship acceptance, and assisting in managing student attendance and providing internship certificates [6].

Next, there is a study by H D Yulianto and R B Firdaus on the Design of Internship Monitoring Information System. This study discusses the development of an information system to replace the conventional attendance and daily activity reporting system for internship students with a computerized system. The method used in this study is a descriptive method that aims to describe the situation at the research location. The result of this study is a computerized information system design that includes a website and a mobile application. In this information system, the use of GPS technology allows the precise location of students to be obtained when they report their attendance and inquire about the reasons if they report their attendance not at their internship location [7].

In addition, there is also a study conducted by R Mulia, K S Rosi, and A Reynold titled "Rancang Bangun Sistem Pendaftaran Mahasiswa Magang Pada Program Studi Sarjana Sosiologi Fisip Universitas Indonesia Depok" (Design and Development of Internship Student Registration System for Undergraduate Sociology Program at FISIP Universitas Indonesia Depok). The focus of this study is to design a web-based internship student information system for the sociology undergraduate program at FISIP Universitas Indonesia, with the aim of helping students and relevant parties in carrying out their internship activities more safely, effectively, and efficiently.

The result of this study is a web-based internship information system that can manage and provide the necessary information for sociology students and relevant parties. This system can also transform the paper-based model into a digital-based model, making it more effective and efficient in supporting activities at the FISIP Universitas Indonesia Undergraduate Sociology Program [8].

Based on several previous studies, it can be concluded that the development of a web-based internship information system using the Laravel framework has the potential to provide convenience in the internship process for students and internship managers. In the study conducted by the authors, the focus will be on the development of an internship information system that can facilitate prospective internship participants in the registration process until the final reporting, as well as assist the university in easily managing all internship data quickly and easily.

II. METHOD

The research methodology used in this study using waterfall method includes the following steps [9]:

1. Literature review: The first step in this research is to conduct a literature review to understand the concept of internship student information system.

2. Needs analysis: The second step is to conduct a needs analysis of the users, including students, supervising and examining lecturers, and the university as the internship manager. This is done through interviews and observations with relevant parties.

3. System design: After gathering user requirements, the next step is to design the system. System design includes interface design, database design, and business process design.

4. System implementation: After system design is complete, the next step is to implement the system using the Laravel framework. At this stage, program code development, database development, and system integration will be carried out.

5. Testing and evaluation: After implementation is complete, the next step is to test and evaluate the designed system. The results of

this testing will be evaluated to determine whether the system meets user needs or not.

6. Report preparation: After testing and evaluation are completed, the final step is to prepare the research report. The research report contains a description of the research methodology, research findings, and conclusions drawn from the research.

III. RESULT AND DISCUSSION

Based on the results of the conducted requirement analysis, the system design and its implementation are as follows:

A. Database Design

The database design serves as a reference for managing data that will be processed in the system to be developed. The database design for this system will be depicted in an Entity Relationship Diagram (ERD). An ERD is a diagram model that represents the structure of a database using entities, attributes, and relationships between entities [10]. The ERD of the student internship management information system to be developed consists of several main entities, namely Student, Supervisor, Internship, Logbook, Examiner, Report, Minutes of Meeting, and Final Presentation. The ERD diagram is illustrated in Fig. 1.
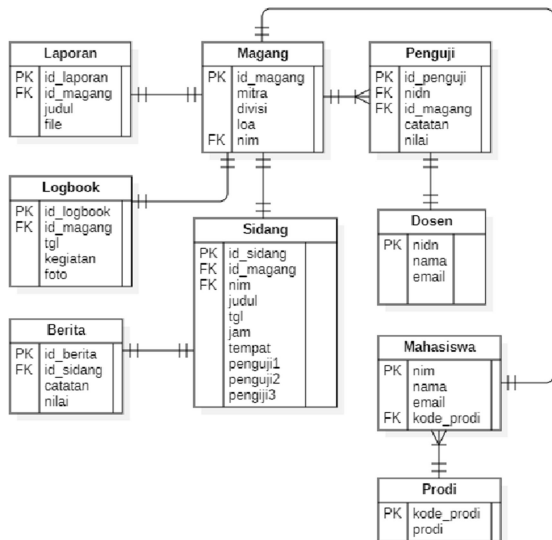

Fig. 1. ERD of the Student Internship Information System

B. Use Case Diagram

A Use Case Diagram is a model diagram used to represent the interaction between users or actors and a system[11]. In the student internship management information system, the Use Case

Diagram can be used to model the main functions that can be performed by users or actors in the system. The actors in this system are the Students, Mentors, and Admin or Internship Coordinators. The student actor represents students registered in the internship program, the mentor actor represents the supervisor and examiner who provide guidance and assessment to students, and the Admin actor represents the administrator responsible for managing the system. The Use Case Diagram is shown in Fig. 2.
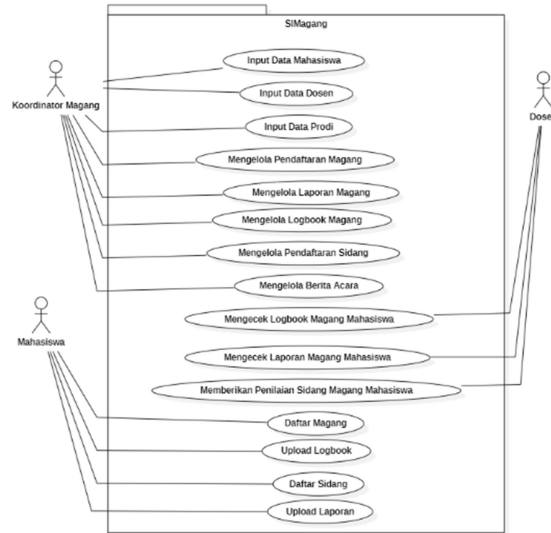

Fig. 2. Use Case Diagram of Student Internship Information System

C. Activity Diagram

An Activity Diagram is a diagram used to model workflow or activities in a system[12]. In the student internship management information system, the Activity Diagram can be used to model the workflow that occurs in the system, from beginning to end. Below are several activity diagrams in the student internship management information system that have been designed.
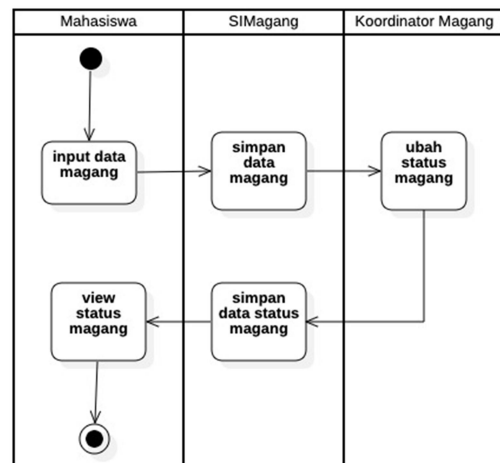
a) Internship Registration Activity Diagram

Fig. 3. Activity Diagram for Internship Registration

The activity diagram in Fig. 3 illustrates the internship registration process that starts with the student entering the internship data completeness into the internship information system, starting from personal data, internship period, partner company data, and proof of acceptance letter from the partner company. After that, the internship coordinator, through the internship information system, validates the data entered by the student and then arranges the name of the supervising lecturer into the internship registration data.
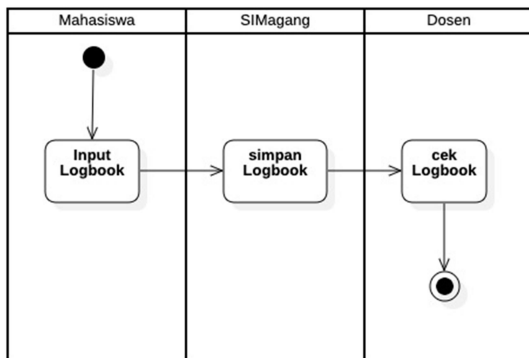
b) Internship Logbook Activity Diagram

Fig. 4. Activity Diagram for Internship Logbook

The activity diagram above illustrates the process of reporting internship activities by students through the Logbook input feature in the internship information system. Each logbook inputted by the student will be checked by the assigned academic supervisor. The logbook function also records the guidance activities between the student and the academic supervisor in preparing the internship report.

c) Activity Diagram for Internship Final Presentation Registration
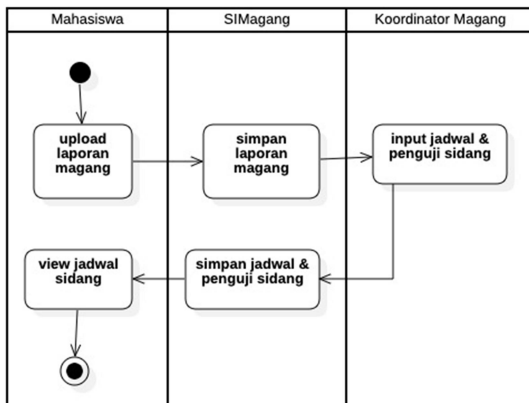

Fig. 5. Activity Diagram for Internship Final Presentation Registration

The diagram above represents the process of registering for a final project presentation (defense) which is the final stage of the internship program. In order to be able to do the final project presentation, students must register through the internship information system by uploading their internship report. Then, the internship coordinator will create a presentation schedule along with the examiners and store the data in the internship information system. Students can view the schedule of the presentation from the internship information system.

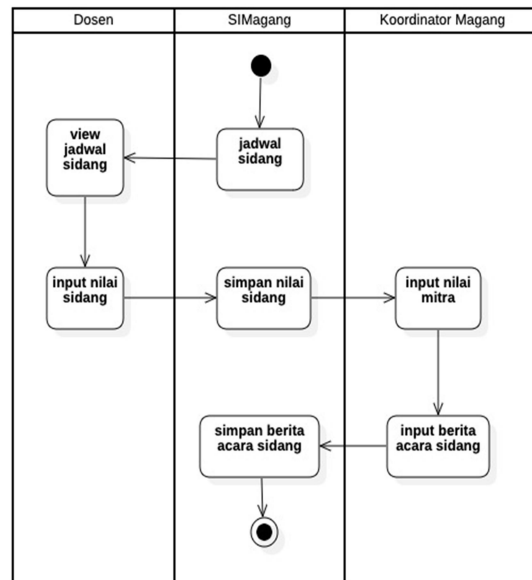d) Activity Diagram of the Minutes of the Final Internship Report Defense

Fig. 6. Activity Diagram for the Minutes of Meeting of the Thesis Defense

The minutes of the internship report defense is a documentation that records the internship report defense activity which contains a summary of the gradings from the examiners and the partner company of the internship. The minutes of the defense can be entered after the examiners input the defense grading through the internship information system, then the internship coordinator inputs the grading of the partner company to be accumulated with the examiners' gradings to produce the final internship grading.

D. Implementation Results

The result of developing a student internship management information system is the creation of a system that can help manage student internship

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programs more effectively and efficiently. Some of the results that can be achieved from the development of this system include:

1. Ease of administration: With the student internship management information system, administrative processes such as registration, submission of internship reports, and student performance evaluation can be done online and automated. This can reduce the time and cost required for manual administration.

2. Transparency in evaluation and performance assessment: The student internship management information system has features for evaluating/student performance assessment during their internship. The results of this evaluation can be accessed by students, internship examiners/supervisors, and internship program managers. This can provide transparency in evaluating student performance and facilitate decision-making related to student performance assessment.

3. Increased efficiency in internship program management: With the student internship management information system, internship program managers can easily see information about students who are interning, internship status, and progress that students have made. This can facilitate internship program management and help in making decisions related to the development of internship programs in the future.

4. Cost and time savings: In the long run, the use of a student internship management information system can save costs and time required to manage internship programs manually. This can provide efficiency and effectiveness in managing student internship programs.

Overall, the results of developing the student internship management information system can provide benefits for all parties involved in the internship program, such as internship program managers, students who are undergoing internships, and supervising examiners/lecturers in assessing and monitoring their students. The results of the program development include:

1. Login

The login page, as shown in Fig. 7, is the initial page used by users to enter the system.

This page provides a feature for entering login information in the form of a username and password provided by the system administrator. After entering the login information, the system will verify the validity of the data entered. If the data is valid, the user will be directed to the dashboard page according to their role. However, if the entered data is invalid, the system will give an error notification and ask the user to enter the correct login information. The login page in the student internship management information system is very important because it is the gateway to accessing all information related to student internships. In addition, this page also provides security protection for the information system because only those with valid login information can access it.
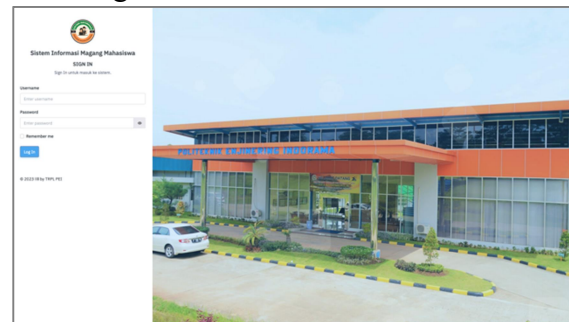

Fig. 7. Login Page

2. Dashboard

The dashboard page, as shown in Fig. 8, is the main page displayed after the user successfully logs into the system. This page contains important information and an overview of the internship activities that have been or are being carried out by the students. The dashboard page in the student internship management information system provides convenience for students to monitor their progress and update information related to their internship activities. In addition, this page also helps internship managers to monitor the internship activities of the students and ensure that the internship runs effectively and efficiently.
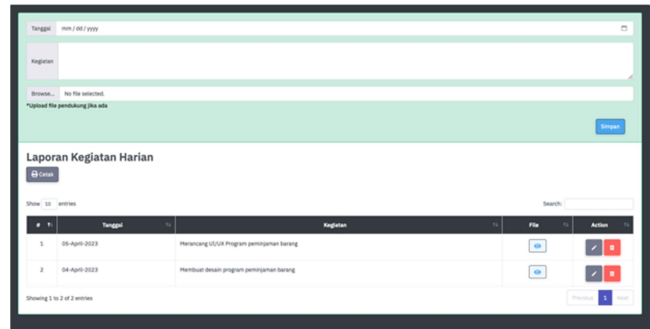
Fig. 8.   Dashboard Page

3.   Internship Registration

The internship registration page, as shown in Fig. 9, is a page that allows students to register and apply for internships to the internship administrator on campus through the system. This page usually includes several important sections such as inputting the student ID number, name, program of study, the name of the company and the division being applied for, as well as a letter of acceptance from the company. After the student completes the registration form and meets the specified requirements, the administrator through this system will process the internship application and provide the application status whether it is accepted or not.
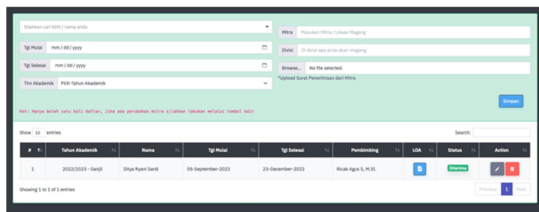

Fig. 9.   Internship Registration Page

4.   Logbook

The logbook page as shown in Fig. 10 is a page that allows students to record their activities during the internship period. On this page, students can record information about the activities they have done during the day, difficulties encountered, and solutions found. The logbook page is very important because it allows students to monitor and record the activities they have done during the internship period. In addition, this page also helps internship managers to monitor the internship activities carried out by students and ensure that the students have carried out their internships in accordance with applicable regulations.

5.   Report

The report page, as shown in Fig. 11, is a page that allows students to submit their completed internship reports to their supervising lecturers through the system. After submission, the supervising lecturer can review the report and provide feedback, either by accepting the report, requesting revisions, or rejecting it. If revisions are needed, the student must make the necessary changes and resubmit the report. However, if the report is accepted, the student can move on to the next stage, which is the final internship presentation.
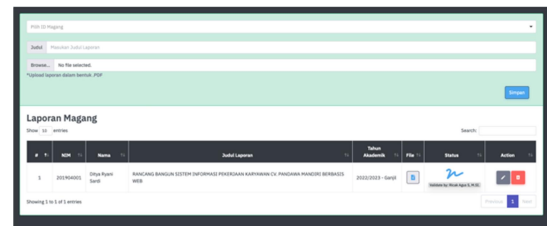

Fig. 11.   Report Page

6.   Thesis Defense

Thesis defense page, as shown in figure 12 below, is a page for managing the scheduling of thesis defense conducted by the internship manager. Supervisors and students can only see the schedule of their respective thesis defense. The information contained on this page includes the names of the thesis defense participants, title, room, date, time, and examination committee.
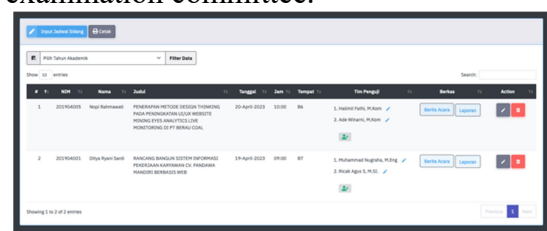

Fig. 12.   Thesis Defense Page

Fig. 10.   Logbook Page

7. Thesis Assessment by Examiner

The examiner assessment page, as shown in Fig. 13, is a page used by examiners during a thesis defense. On this page, examiners can select the student being examined and provide some notes on the results of the thesis defense as well as input the assessment score. The results of this assessment will be summarized in the minutes of the thesis defense which can be viewed by the student.
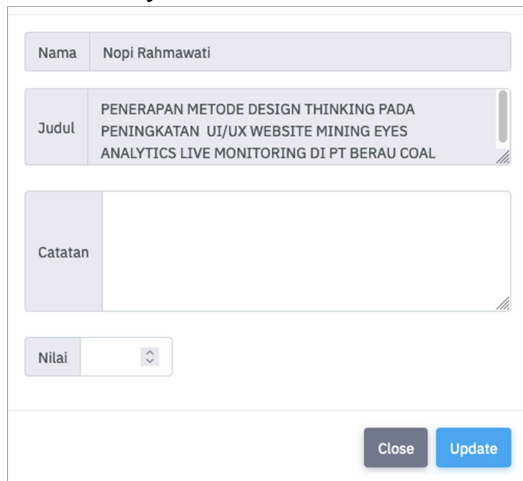

Fig. 13. Examiner Assessment Page

8. Assessment Report

Page of assessment report, as shown in Figure 14 below, contains information about the results of the thesis defense conducted by the student. This page includes notes and grades given by the thesis defense committee to the student. The result of this report will serve as a reference for the student to make revisions to their thesis based on the feedback received during the thesis defense. Additionally, on this page, the student can directly see their final grade, which is the compilation of grades given by the industry and the thesis defense committee.
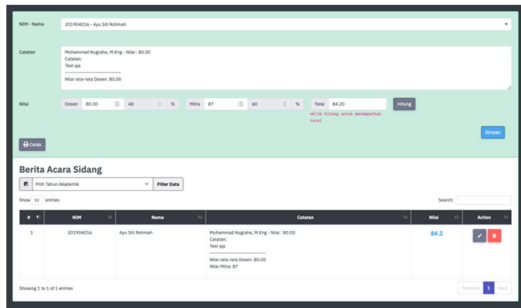

Fig. 14. Assessment Report Page

E. Implementation Results

Testing is carried out using User Acceptance Testing (UAT) which involves end users for testing. In this test, 30 users were involved consisting of lecturers, students, and staff components. Before filling out the questionnaire, all users were given tutorials on using the system. The test instrument used is a questionnaire with a measurement scale using a Likert scale. The point rating scale is divided into 5 answers, namely strongly disagree, disagree, undecided, agree, and strongly agree. UAT is carried out to determine the extent to which the level of acceptance of the system that has been built whether the results are as expected or not. The results of the assessment are as shown in Table 1 with the category of assessment variables divided into 5 parts.

TABLE I
UAT testing result

Aspect of Assessment	Presentation	Status
Validation	87 %	Very good
Function	90 %	Very good
Usability	88 %	Very good
System performance	90 %	Very good
Interface	91 %	Very good

IV. Conclusion

Based on the discussion above, it can be concluded that the student internship management information system can help improve the efficiency and effectiveness of the student internship management process. This system allows students to register, report their activities, and get real-time updates related to their internship. In addition, the system also allows internship supervisors to monitor and evaluate the progress of students during their internship, and the system provides ease for managers to manage student and internship data, as well as simplify the evaluation and assessment process. Therefore, it can be concluded that this web-based student internship management information system provides many benefits and ease in managing the internship program for students, lecturers, and institutions as internship managers.

V. ACKNOWLEDGMENT

VI. REFERENCES

[1] BPM PEI, *SOP Praktek Kerja Lapangan PEI*. Indonesia: https://bpm.pei.ac.id/pob/, 2014.

[2] H. Halimi and - Ishaq Jound, "Comparison of performance between Raw SQL and Eloquent ORM in Laravel." [Online]. Available: www.bth.se

[3] M. Laaziri, K. Benmoussa, S. Khoulji, and M. L. Kerkeb, "A Comparative study of PHP frameworks performance," in *Procedia Manufacturing*, Elsevier B.V., 2019, pp. 864–871. doi: 10.1016/j.promfg.2019.02.295.

[4] U. Khaira Latif and T. F. Kusumasari, "Performance Comparison of Executing Large Data in Yii2 and Laravel Framework," *International Journal of Innovation in Enterprise System*, vol. 01, pp. 2580–3050, 2017.

[5] S. Radack, "The System Development Life Cycle (SDLC) NIST Special Publication (SP) 800-64, Revision 2, Security Considerations in the System Development Life Cycle."

[6] Ayu Vanesa and Elfi Tasrif, "Jurnal Vocational Teknik Elektronika dan Informatika," *Jurnal Vocational Teknik Elektronika dan Informatika*, vol. 10, no. 1, pp. 12–19, Mar. 2022, [Online]. Available: http://ejournal.unp.ac.id/index.php/voteknika/index

[7] H. D. Yulianto and R. B. Firdaus, "Perancangan Sistem Informasi Monitoring Magang Design Internship Monitoring Information System," *IJIS Indonesian Journal on Information System*, pp. 130–136, Sep. 2021.

[8] M. Rahmayu and R. K. Serli, "Rancang Bangun Sistem Pendaftaran Mahasiswa Magang pada Program Studi Sarjana Sosiologi FISIP Universitas Indonesia Depok," *Jurnal SIMETRIS*, vol. 10, no. 2, 2019.

[9] Mei Prabowo, *Metodologi Pengembangan Sistem Informasi*. LP2M Press IAIN Salatiga, 2020.

[10] Y.-L. Li Qing and Chen, "Entity-Relationship Diagram," in *Modeling and Analysis of Enterprise and Information Systems: From Requirements to Realization*, Berlin, Heidelberg: Springer Berlin Heidelberg, 2009, pp. 125–139. doi: 10.1007/978-3-540-89556-5_6.

[11] A. Gemino and D. Parker, "Use case diagrams in support of use case modeling: Deriving understanding from the picture," *Journal of Database Management (JDM)*, vol. 20, no. 1, pp. 1–24, 2009.

[12] A. and R. E. Börger Egon and Cavarra, "An ASM Semantics for UML Activity Diagrams," in *Algebraic Methodology and Software Technology*, T. Rus, Ed., Berlin, Heidelberg: Springer Berlin Heidelberg, 2000, pp. 293–308.