



Design And Development Of A Web-Based Thesis Administration System To Improve The Efficiency Of Academic Services

Yoel Cleaver Kalumata^{1*}, Benny Pinontoan², Mahardika Inra Takaendengan³, Wisard Widsli Kalengkongan⁴, Stephano Caesar Wenston Ngangi⁵, Dodisutarma Lapihu⁶
1,2,3,4,5,6 Information Systems, Universitas Sam Ratulangi, Indonesia
¹yoelkalumata106@ststudent.unsrat.ac.id, ²bpinonto@unsrat.ac.id, ³mahardika@unsrat.ac.id, ⁴wisard.kalengkongan@unsrat.ac.id, ⁵dlapihu@unsrat.ac.id

Abstract: The thesis administration services in the Information Systems Study Program still rely on manual procedures that are slow and prone to errors. This study aims to improve the efficiency of academic services by developing a web-based thesis administration system using the Rapid Application Development (RAD) method. This method was chosen for its ability to support fast and iterative system development. Data were collected through literature studies, observations, questionnaires, and interviews. The research results show that the system successfully simplifies administrative processes and reduces processing time from 5 minutes to 1 minute per student, reflecting an 80% increase in efficiency. This system makes a significant contribution to improving the quality of academic services.

Keywords: Administrative System, RAD, Website, Academic Service Efficiency.

1. INTRODUCING

The administrative process for thesis in the Information Systems Study Program, which is still carried out manually, often poses challenges for students, lecturers, and administrative staff. Students frequently experience delays in processing the required documents because administrative staff must handle requests individually, making it difficult for students to complete their theses on time. Additionally, the manual system increases the likelihood of errors in recording data, leading to inaccurate information being provided to students. Students also struggle to track the progress of their theses due to the absence of an integrated system that allows access to such information. On the other hand, administrative staff must manually manage data, which is time-consuming and reduces work efficiency. This situation highlights the need for a technology-based administrative system to address these challenges and improve the quality of administrative services.

Based on these issues, the data management process for undergraduate theses is relatively well-structured but lacks effectiveness. The proposed solution is to develop an Administrative Management Information System. According to previous research (Sabirin et al., 2020), a management information system is necessary as it enhances service delivery and operational processes within the study program, particularly for students. The implementation of this system will facilitate the administrative process, making it more efficient for both administrative staff and students throughout the various stages of thesis completion.

Several previous studies serve as references for this research, including "Design and Development of an Administrative Management Information System for Internships and Theses Using the RAD Method" (Baqi et al., 2022), which discusses the design and development of a system to assist the administrative process for internships and theses using the RAD method. Another relevant study is "Design and Development of an Academic Administration Information System for the Information

Yoel Cleaver Kalumata: *Corresponding Author



Copyright © 2025, Yoel Cleaver Kalumata, Benny Pinontoan, Mahardika Inra Takaendengan, Wisard Widsli Kalengkongan, Stephano Caesar Wenston Ngangi, Dodisutarma Lapihu.



Systems Study Program at Krisnadwipayana University" (Devia, E., 2024), which focuses on developing an academic administration information system for the Information Systems Study Program at Krisnadwipayana University using the RAD method. Additionally, "Design and Development of a Web-Based Thesis and Internship Information System" (Kasim, A. et al., 2020) aims to develop an application system for managing thesis and internship data to support the academic administration system in the Department of Informatics Engineering at Gorontalo State University.

The thesis focuses specifically on the Information Systems Study Program and aims to improve thesis administration services. This is in line with Devia, E. (2024), which also targets a specific academic program, but the focus is specifically on thesis administration, whereas Devia's focus is broader academic administration. Baqi et al. (2022) has a broader scope, focusing on both internships and theses for administrative processes, while Kasim et al. (2020) focuses on both thesis and internship data management for a particular department (Informatics Engineering). A significant differentiator in the abstract is the quantitative measurement of efficiency: reducing processing time from 5 minutes to 1 minute per student, reflecting the 80% improvement.

2. RESEARCH METHODOLOGY

2.1 Time and Place of Research

This research began in November 2024 and ended in May 2025. The research was conducted at the Information Systems Study Program, Faculty of Mathematics and Natural Sciences, Sam Ratulangi University, Manado.

2.2 Data Collection Technique

To obtain the data needed to support the implementation of this research, author used several data collection techniques as follows:

1. Literature Study

Literature study is done by studying several journals and books related to Academic Information Systems and the Rapid Application Development (RAD) method.

2. Observation

Observation is done by direct observation of the object under study, namely within the scope of the Information Systems Study Program, Faculty of Mathematics and Natural Sciences, Sam Ratulangi University, Manado.

3. Questionnaire

This questionnaire is designed in the form of questions related to system requirements, the importance of developing the website being studied, users' experiences with the current methods, and also covers aspects of functionality and the effectiveness of the current administrative management process.

4. Interview

The author conducted interviews with final-year students as well as administrative staff of the Information Systems Study Program at Sam Ratulangi University to obtain more in-depth and detailed information about the common problems faced in the thesis administration process, as well as the

essential features that need to be developed on the website so that the system being built truly meets user needs and supports the administrative process efficiently.

2.3 Research Stages

At the research stages, a series of steps taken by the author is explained and illustrated through a flowchart. The research stages can be seen below. These stages include the process of planning, data collection, system requirements analysis, design, and implementation of a web-based system that aligns with the thesis administration needs of the Information Systems Study Program at Sam Ratulangi University.



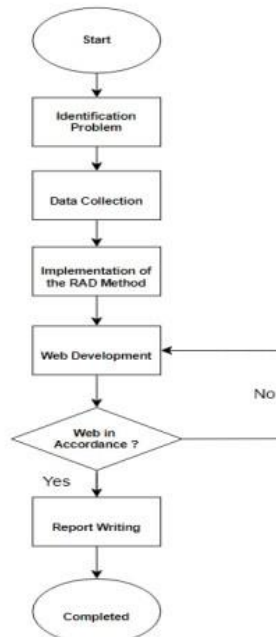


Figure 1. Research Stages

1.4 Research Method

In the research stage, the software development method used is the Rapid Application Development (RAD) method.



Figure 2. RAD Method

The stages on Rapid Application Development is as follows:

1. Planning Needs

At this stage, information collection is carried out about the administrative process to identify the needs of the thesis administration application. Information is obtained through interviews, observations and questionnaires with administrative officers, supervisors, and students.

2. System Design

System design is carried out based on the results of needs planning in the previous stage. This stage involves the interface design process with users, namely information system students. In addition to interface design, this system design will also use UML (Unified Modeling Language), namely Use Case Diagram, Activity Diagram, Class Diagram and Entity Relationship Diagram (ERD) for database design.

a) Prototype

The author's part designs a rough base using wireframes followed by making application prototypes by making interface designs using Bothstrep studio

b) Test

At this stage, testing the application prototype is carried out by conducting direct tests to users and conducting interviews to get input.

c) Iterate

The iteration process allows developers to perform regular evaluations and make improvements based on feedback or previous test results. Each repetition or iteration typically brings enhancements or updates that lead to a better final outcome, more aligned with the intended

requirements.

3. Development

After the system design stage, this thesis administration application is built in accordance with the refined system design design. Application development is carried out using a programming language with the Laravel framework

4. Application Testing Using the Black Box Method

After the stages of the application development phases are complete, the application will be tested using the Black Box Testing method. Testing will be carried out on the successful implementation of the interface, functions and features based on the requirements identification that has been carried out. Application testing using the Black Box method aims to find out whether the application created is appropriate and good.

3. RESULT AND DISCUSSIONS

3.1 Problem Analysis

From the results of the interviews with the administrative staff and a student, problems were identified such as slow document management and a manual registration process for thesis examinations in the Information Systems Study Program at Sam Ratulangi University, Manado. The author also collected data through questionnaires distributed to students.

Functional Requirements	Non-Functional Requirements
<p>The admin can log in to access the system.</p> <p>The admin has the authority to add student data for those who are permitted to access the system.</p> <p>The admin can delete student data from the system when necessary.</p> <p>The admin can manage and publish announcements to students.</p> <p>Students can register for exams according to the available exam stages.</p> <p>Students can view the list of registered exam participants.</p> <p>Students have access to view announcements published by the admin.</p>	<p>The system can only be accessed by two types of users: admin and students, each with different access rights.</p> <p>Students can only access the system after being verified or registered by the admin.</p> <p>The system is designed to be responsive and compatible for use on both mobile devices and desktop/laptop computers.</p>
<p>The admin can download the results or data submitted by students through the system.</p>	

3.2 System Modelling

In modelling the system, the author uses UML (Unified Modeling Language) modeling tools, including a Use Case Diagram to illustrate interactions between users and the system, and an Activity Diagram to show the flow of activities within the system

3.2.1 Use Case Diagram

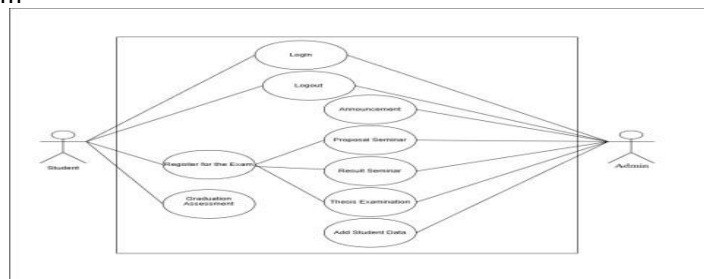


Figure 3. Use Case Diagram

The Use Case Diagram visually and structurally illustrates the relationship between users and the

Yoel Cleaver Kalumata: *Corresponding Author



Copyright © 2025, Yoel Cleaver Kalumata, Benny Pinontoan, Mahardika Inra Takaendengan, Wisard Widsli Kalengkongan, Stephano Caesar Wenston Ngangi, Dodisutarma Lapihu.

system. In this case, there are two main actor roles involved, namely Admin and Student, each with different functions and access rights according to their responsibilities in the thesis administration process. The description of each actor is as follows:

1. The Admin can log into the system via the web and easily manage student data.
2. The Student can log into the system to view information and register for thesis exams online.

3.2.2 Activity Diagram

The Activity Diagram illustrates the flow of activities within the system. There are two diagrams that each shows the process involving either the Admin and Student. The Admin's Activity Diagram plays a crucial role in viewing documents submitted by students and managing student data within the system. In the Student Activity Diagram of this system, students can view announcements made by the admin, register for exams based on the exam they wish to take, and fill out the administrative exam documents available in the system. Each of the diagrams can be seen as follows:

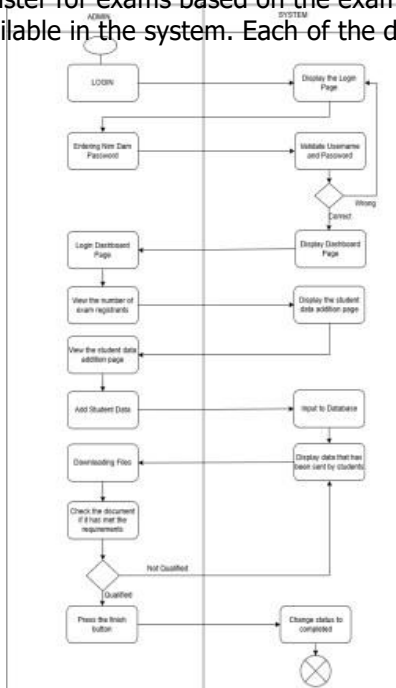


Figure 4. Admin Activity Diagram

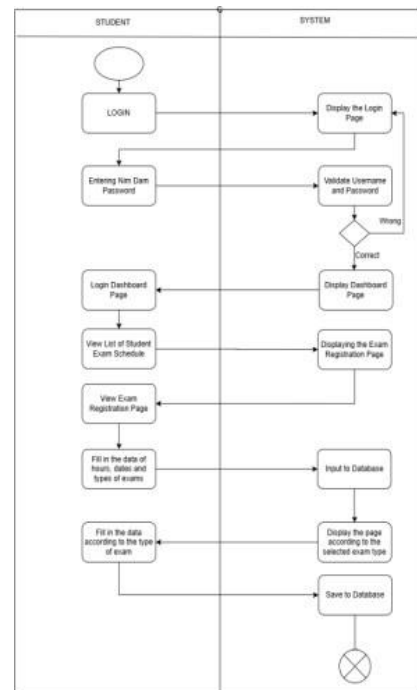


Figure 5. Student Activity Diagram

3.2.3 Sequence Diagram

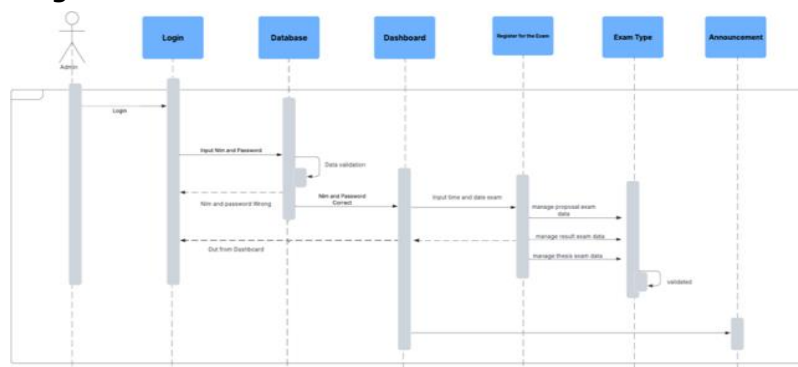


Figure 6. Admin Sequence Diagram

Figure 6 displays the Sequence Diagram for Admin, illustrating the step-by-step interactions in the system.

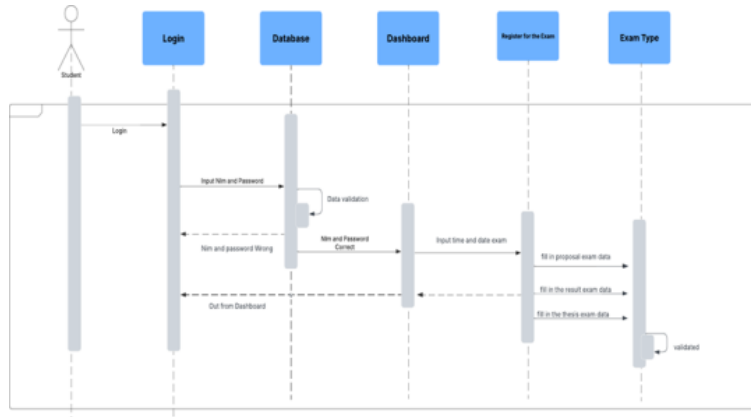


Figure 7. Student Sequence Diagram

Figure 7 displays the Student Sequence Diagram, illustrating the interaction between students and the system. In this diagram, students can log in by entering their Student Identification Number (NIM) and Password, which has been provided by the admin.

3.3 System Design

3.3.1 Login Screen

Figure 8 displays the login screen where both admin and students can access the system by entering their Student Identification Number (NIM) and password. For students, the password is provided by the administrative staff of the Information Systems study program.



Figure 8. Login Screen

3.1.2 Student Screen

- Dashboard

In Figure 9, the student dashboard is displayed, where students can view announcements from the admin and check the schedules of other students who will be taking exams, complete with the exam time.

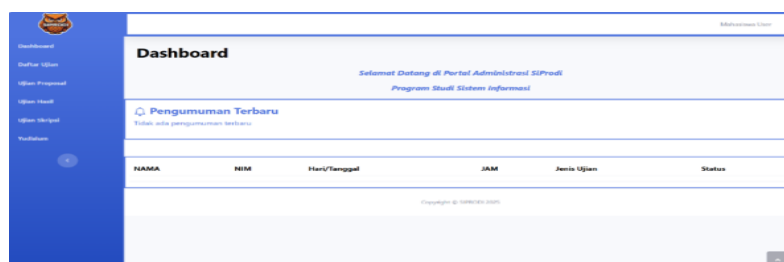


Figure 9. Dashboard Screen

- Exam Registration

In Figure 10, the screen for students to register for an exam is shown. Students can enter the exam date and time. On this screen, students do not need to enter their full name and Student Identification Number (NIM) as these details are already included.

Figure 10. Exam Registration Screen

- Proposal Exam

In Figure 11, the screen displays the registration form for students who want to take the proposal seminar exam. In this screen, students fill in the required data, including title Proposal, Supervisor 1, Supervisor 2, Examiner 1, Examiner 2, and the Seminar committee.

Figure 11. Proposal Exam Screen

- Result Exam

In Figure 12, the screen displays the registration form for students who have registered for the Seminar Final exam. In this screen, students fill in the form with details such as the title, Supervisor 1, Supervisor 2, Examiner 1, Examiner 2, Examiner 3, and the Seminar committee.

Figure 12. Final Exam Screen

- Thesis Exam

In Figure 13, the screen is similar to the Proposal Exam and Seminar result Exam screens. Here, students fill in details such as the title, Supervisor 1, Supervisor 2, Examiner 1, Examiner 2, Examiner 3, and the Seminar committee.

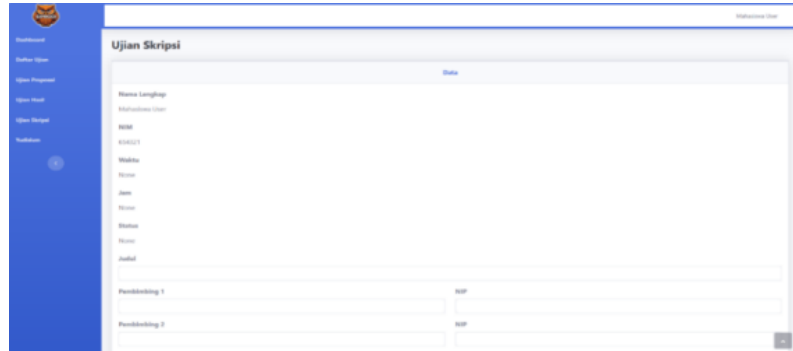


Figure 13. Thesis Exam Screen

- Graduation Assessment

In Figure 14, the screen allows students to see the requirements needed to proceed to the Yudisium stage.

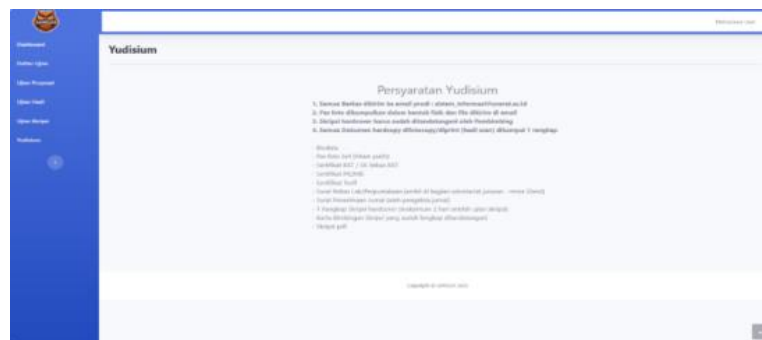


Figure 14. Graduation Assessment Screen

3.1.3 Admin Screen

- Dashboard Screen

In Figure 15, the screen displays the initial view when the admin logs into the system. On this Dashboard, the admin can see the total number of registrants who will take exams based on the selected exam type.



Figure 15. Admin Dashboard Screen

- Student Data

In Figure 16, the screen displays student data that can be viewed and accessed in the system. The

admin can delete or add student data as needed.

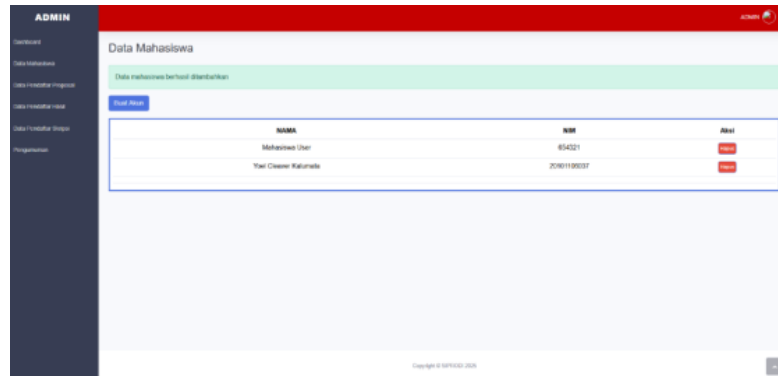


Figure 16. Student Data Screen

- New Account Creation

Figure 17 shows the display when the admin will add students who want to enter the system by adding data in the form of full name, Student Identification Number (NIM) and Password that will be given to the student.



Figure 17. New Account Creation Screen

- Proposal Registrants Data

In Figure 18, the screen allows the admin to view the history of students who have taken the Proposal Seminar exam. The admin can also download the documents submitted by students who have registered for the Proposal Seminar exam. The downloaded documents will be printed and given to the students.



Figure 18. Proposal Registrants Data Screen

- Seminar Result Registrants Data

In Figure 19, the screen allows the admin to view the history of students who have taken the Seminar Result exam. The admin can also download the documents submitted by students who have registered

for the Seminar Result exam. The downloaded documents will be printed and given to the students.

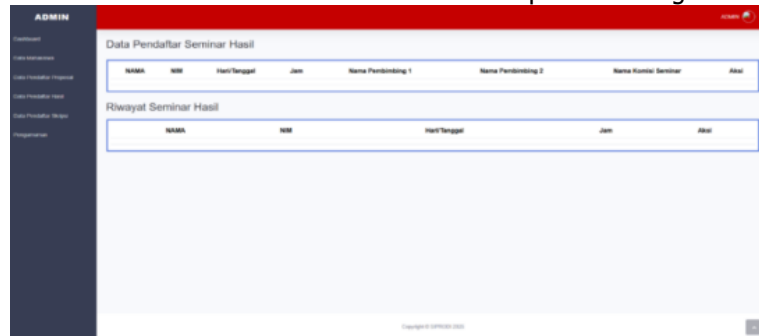


Figure 19. Seminar Result Registrants Data Screen

- Thesis Exam Registrants Data

In Figure 20, the screen allows the admin to view the history of students who have taken the thesis exam. The admin can also download the documents submitted by students who have registered for the thesis exam. The downloaded documents will be printed and given to the students.



Figure 20. Thesis Exam Registrants Data Screen

- Announcement Creation

In Figure 21, the screen allows the admin to create announcements for students. The announcements entered will appear on the student homepage.

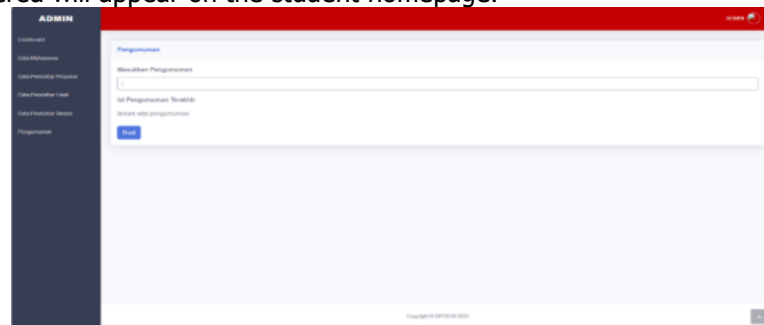


Figure 21. Announcement Creation Screen

4. CONCLUSION

This research concludes that the system developed using the Rapid Application Development (RAD) method has significantly improved the efficiency of academic services in the Information Systems Study Program. This system is able to overcome delays in document processing and streamline administrative procedures. The effectiveness of the services has dramatically increased, with the administration processing time per student reduced from 5 minutes to only 1 minute, demonstrating an efficiency improvement of 80%. For

Yoel Cleaver Kalumata: *Corresponding Author



Copyright © 2025, Yoel Cleaver Kalumata, Benny Pinontoan, Mahardika Inra Takaendengan, Wisard Widsli Kalengkongan, Stephano Caesar Wenston Ngangi, Dodisutarma Lapihu.



suggestions to future authors, additional features such as notifications and the ability to upload other documents beyond just thesis exam documents could be included. Additional security measurement features such as "forgot password" and communication to and from Administrators regarding thesis registration process is also important to be added.

5. REFERENCES

- [1] D. Ambriani and A. I. Nurhidayat, "Rancang bangun repository publikasi ilmiah dosen berbasis web menggunakan framework Laravel," *Jurnal Manajemen Informatika*, vol. 10, no. 1, pp. 58–66, 2020.
- [2] R. Baqi, P. Choirina, and U. M. Jannah, "Rancang Bangun Sistem Informasi Manajemen Administrasi PKL dan Skripsi Menggunakan Metode RAD," in *Seminar Nasional Sistem Informasi (SENASIF)*, vol. 6, pp. 3423–3432, Sept. 2022.
- [3] E. Devia, "Rancang Bangun Sistem Informasi Administrasi Akademik Pada Program Studi Sistem Informasi Universitas Krisnadipayana," *Jurnal Information System*, vol. 4, no. 1, pp. 7–16, 2024.
- [4] M. D. Firmansyah and H. Herman, "Perancangan web e-commerce berbasis website pada Toko Ida Shoes," *Journal of Information System and Technology (JOINT)*, vol. 4, no. 1, pp. 361–372, 2023.
- [5] A. Kasim, L. Hadjaratie, and R. H. Dai, "Rancang bangun sistem informasi skripsi dan kerja praktik berbasis web," *Jambura Journal of Informatics*, vol. 2, no. 2, pp. 95–107, 2020.
- [6] A. Putra, "Perancangan Sistem Informasi Administrasi Skripsi," *Jurnal Teknologi dan Sistem Informasi*, vol. 9, no. 2, pp. 45–52, 2021.
- [7] F. Sabirin, D. Sulistiyarini, and Z. Zulkarnain, "Pengembangan Sistem Informasi Seminar dan Skripsi Mahasiswa," *Edumatic: Jurnal Pendidikan Informatika*, vol. 4, no. 1, pp. 73–82, 2020. [Online]. Available: <https://doi.org/10.29408/edumatic.v4i1.2048>
- [8] I. P. Sari, A. Syahputra, N. Zaky, R. U. Sibuea, and Z. Zakhir, "Perancangan sistem aplikasi penjualan dan layanan jasa laundry sepatu berbasis website," *Blend Sains Jurnal Teknik*, vol. 1, no. 1, pp. 31–37, 2022.
- [9] J. Winanjar and D. Susanti, "Rancang Bangun Sistem Informasi Administrasi Desa Berbasis Web Menggunakan PHP Dan MySQL," *PROSIDING SNAST*, pp. 97–105, 2021.
- [10] R. S. Pressman and B. Maxim, *Software Engineering*, New York: McGraw-Hill Education, 2020.
- [11] E. Widarti et al., *Buku Ajar Pengantar Sistem Informasi*, PT. Sonpedia Publishing Indonesia, 2024.
- [12] I. S. Putra, F. X. Ferdinandus, and M. Bayu, "Sistem Pendukung Keputusan Pemilihan Paket Pernikahan Dengan Metode SAW Berbasis Web," *CAHAYATECH*, vol. 8, no. 2, pp. 136–149, 2019. (Catatan: Hanya ini yang berasal dari luar rentang 5 tahun tapi masih relevan)
- [13] A. Zlatkov, "Bootstrap Studio: A Powerful Tool for Web Development." [Online]. Available: <https://bootstrapstudio.io>. [Accessed: 13-Mar-2025].
- [14] A. Khoir, H. Hoiriyah, and A. K. Darmawan, "Pengembangan Sistem Informasi Manajemen Skripsi Berbasis Web," *Jurnal SISKOM-KB*, vol. 8, no. 1, 2024. [Online]. Available: <https://www.jurnal.tau.ac.id/index.php/siskom-kb/article/view/657>
- [15] F. Nathan Tawa, F. Hariadi, and R. M. Indri Malo, "Sistem Informasi Administrasi Skripsi pada Program Studi Peternakan," *Intellektika: Jurnal Ilmiah Mahasiswa*, vol. 2, no. 5, 2024. [Online]. Available: <https://jurnal.stikes-ibnusina.ac.id/index.php/Intellektika/article/view/1591>
- [16] L. M. Diana and E. M. Stefany, "Pengembangan Website Administrasi Skripsi Program Studi Pendidikan Informatika," *Decode: Jurnal Pendidikan Teknologi Informasi*, vol. 3, no. 2, 2024. [Online]. Available: <https://journal.umkendari.ac.id/index.php/decode/article/view/167>
- [17] N. Salsabila, J. Kekenusa, and S. Ngangi, "Aplikasi Sistem Informasi Taman Pendidikan Al-Qur'an (TPA) Az-Zikra Berbasis Website Menggunakan Metode RAD," 2023.
- [18] F. Lesomar, "Apa itu Bootstrap dan Cara Menggunakannya untuk Pemula," *Rumahweb*, 2022.
- [19] M. Joseflim, "Apa Itu Sistem Informasi," *Universitas STEKOM*, 26 Juni 2023. [Online]. Available: <https://stekom.ac.id/artikel/apa-itu-sistem-informasi>
- [20] A. Sallaby and I. Kanedi, "Perancangan sistem informasi jadwal dokter menggunakan framework CodeIgniter," *Jurnal Media Infotama*, vol. 16, no. 1, 2020.

