



Design and Development of the Boarding House Management Information System (SIMKO) Using Laravel with Agile Methodology

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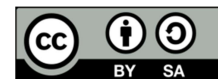
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ABSTRACT

The manual management of boarding houses often causes various problems, such as inaccurate recording of transactions and tenant data, lack of information for prospective tenants, and unstructured booking and payment processes. This research aims to design and build a web-based Boarding House Management Information System (SIMKO) using the Laravel framework and the Agile development method. Data is collected through literature studies, interviews with boarding house owners, and direct observation of boarding houses in the Sedati area. The result of this research is an integrated information system with main features such as boarding house search, filing complaints, recording tenant and transaction data, booking rooms, financial reports, and digital payment support through Xendit. The development process is iterative and flexible to adjust to user needs. This system is expected to increase transparency, as well as the overall quality of boarding business management services.

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1. Introduction

The advancement of information technology has become a key driver in transforming various sectors of life, including business systems and public services [1]. Technological innovations have introduced new ways to manage information, accelerate communication processes, and support economic activities through the use of digital platforms [2]. This development has encouraged businesses of all scales, both small and large, to adopt digital systems that can enhance their efficiency and competitiveness in the market [3].

Amidst these changes, boarding house rental services—one form of accommodation business—have also begun to feel the impact of digitalization. Boarding houses that have traditionally been managed manually are showing various shortcomings, such as errors in financial record-keeping, difficulties in promotion, and limited access to information for potential tenants [4]. The use of information technology in managing boarding houses has become an urgent necessity to address these challenges [5]. A web-based system can assist boarding house owners by providing information, facilitating room bookings, and efficiently handling payments and complaints [6].

Based on an interview with a boarding house owner in the Sedati area, it was found that the management process is still conducted conventionally. Several issues were identified, including the absence of a transaction recording system, irregular room booking procedures, and lack of communication between tenants and owners [7]. These conditions highlight the need for an information system capable of digitally and automatically integrating all these processes [8].

To address these issues, this study proposes the development of an integrated web-based boarding house management information system. The Laravel framework is selected due to its robust development structure suitable for complex-scale applications and strong community support [9]. Moreover, the implementation of the Agile methodology allows the system to be developed iteratively and flexibly in response to changing user needs. To support digital transactions, the system will also be integrated with payment services such as Xendit, making it easier for tenants to make payments online [10]. The designed system is expected to make boarding house management more structured, transparent, and efficient, as well as enhance tenant satisfaction through faster and more accessible services. This integration will reduce the administrative burden and enhance the ease of the payment process [11]. The designed system is expected to make boarding house management more structured and transparent, while also increasing tenant satisfaction through faster and more accessible services. By addressing the weaknesses of conventional systems, this solution aims to improve the overall experience for all users involved.

Furthermore, with real-time data processing and automated workflows, the system will enable owners to gain direct access to essential information such as boarding house income flows and financial reports. This level of information accessibility ensures better decision-making and responsiveness to the operational needs of the boarding house business [12]. In addition, the integration of a user-friendly interface for tenants will provide a more convenient experience in making bookings, payments, as well as submitting complaints. This approach not only enhances tenant engagement but also builds trust and satisfaction—key factors in retaining tenants over the long term [13].

The system's scalability also ensures that as the boarding house business grows, the software can adapt to manage a larger number of tenants, transactions, and room data without sacrificing performance [14] [15]. By leveraging such a digital solution, this system aims to prepare the boarding house business for the future and contribute to the digital transformation of the accommodation sector [16] [17].

2. Research Method

2.1 System Development Methods

This study employs the Agile method approach in the development process of a boarding house management information system. This method was chosen due to its flexibility in adapting to the changing needs of users [18] [19]. The development was carried out iteratively, where each development cycle included planning, building, testing, and evaluation with users, particularly the boarding house owner and tenants [20]. Feedback obtained from each cycle was used for continuous improvement, ensuring that the developed system truly aligns with the needs of the end-users [21].



Figure 1. Agile Methodology

Figure 1 illustrates several stages involved in the Agile methodology approach, which include the following:

1. **Requirements**
This is the initial stage where the development team gathers and documents user requirements and system specifications. At this phase, collaboration between stakeholders and the development team is crucial to ensure that all relevant needs are identified and properly prioritized.
2. **Design**
The design stage involves creating the system architecture and user interface based on the collected requirements. The team designs the technical solution to meet user needs, including selecting appropriate technologies and tools for development.
3. **Development**
At this stage, developers begin coding to build the system according to the established design. This process is carried out in small iterations (sprints), where each iteration delivers a functional part of the software that can be tested.
4. **Testing**
This phase is conducted after each development iteration, where the team performs testing to ensure the developed features work properly and meet quality standards. Testing is carried out continuously during the development phase to detect and fix bugs as early as possible.
5. **Deployment**
Deployment takes place when the software has been tested and is ready to be released into the production environment. At this stage, the team ensures all configurations and settings are in place so the system can operate smoothly in real-world conditions.
6. **Review**
This phase occurs after deployment, where the team evaluates the work completed during the sprint. Feedback from users and stakeholders is gathered to improve the development process in the next sprint and to ensure the final product meets user expectations.

2.2 Data Collection Techniques

The data required in this research was collected through several techniques to obtain relevant and in-depth information. The techniques used are tailored to the research objectives and system development needs. The data collection techniques used include the following:

1. **Literature Review**
In this stage, the author looks for various reference sources in the form of books and journals that discuss boarding information systems. The selected references have a direct relationship with the research topic, so as to provide a theoretical basis that is in line with the problems that occur in boarding house management.
1. **Observation**
The author makes direct observations of the activities that exist at Rindu Kost and Mbak Luh's Blue Yellow Boarding House in the Sedati area. The results of observations are used to identify problems and become a reference for analyzing the needs required.
2. **Interview**
In this method, information related to the research was obtained directly from one of the boarding house owners in the Sedati area. Prior to conducting the interview, the participant was given a brief explanation regarding the purpose of the study and assured that all collected data would be used solely for research purposes and kept confidential. Data was collected by asking a number of questions, both directly through face-to-face meetings and online via WhatsApp, to identify system requirements and gain an overview of the current boarding house management conditions.

3. Result and Discussion

3.1 Requirements

System analysis is an important first step in developing information systems, because it serves to recognize user needs and existing problems [22] [23]. This stage provides an overview of the business processes, user roles, and flow of activities that the system will support [24]. Information is obtained through literature study, observation, and analysis of similar systems [25]. This approach helps in finding obstacles that can be solved with the right solution [22]. In addition, this analysis takes into account the technical aspects and user readiness so that the designed system is easy to implement and as needed [23] [24]. The

results of the analysis become a reference in designing features, data structures, and system flows so that the development of boarding information systems runs effectively and provides real benefits for managers and tenants [25].

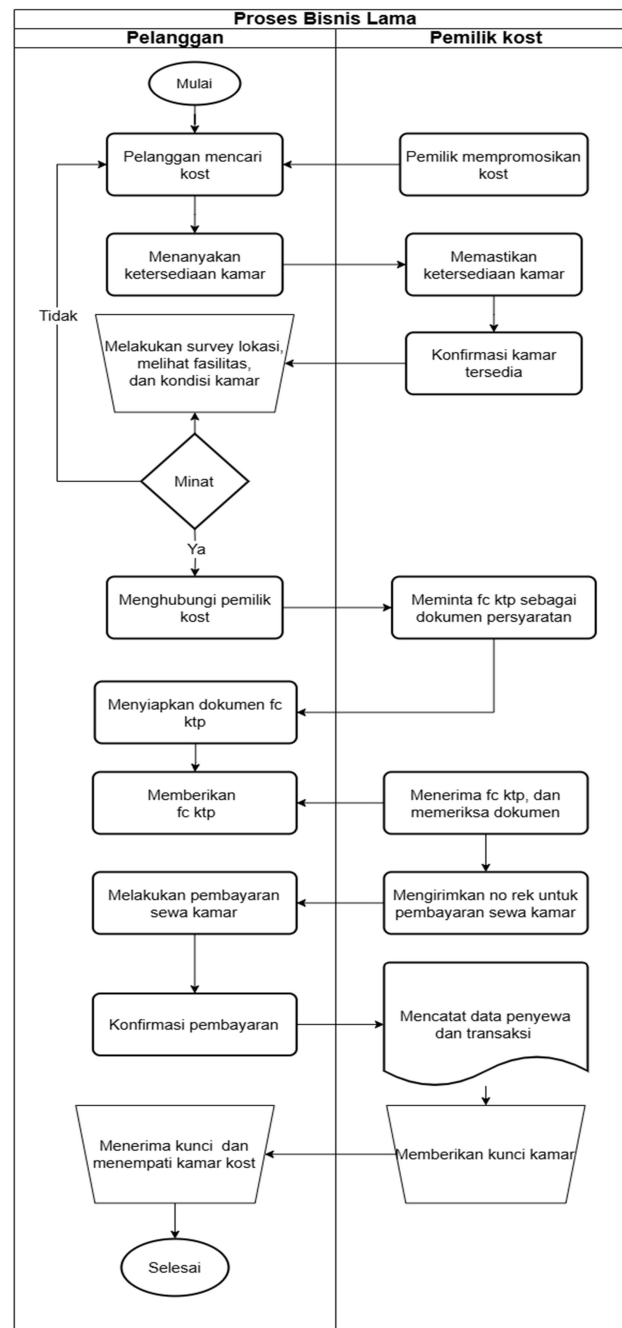


Figure 2. Current Business Process

3.2 Design

This stage utilizes the Unified Modeling Language (UML) to design a boarding information system that will be implemented in the Sedati area. UML was used to visualize the workflow and interaction between users and the system through use case diagrams.

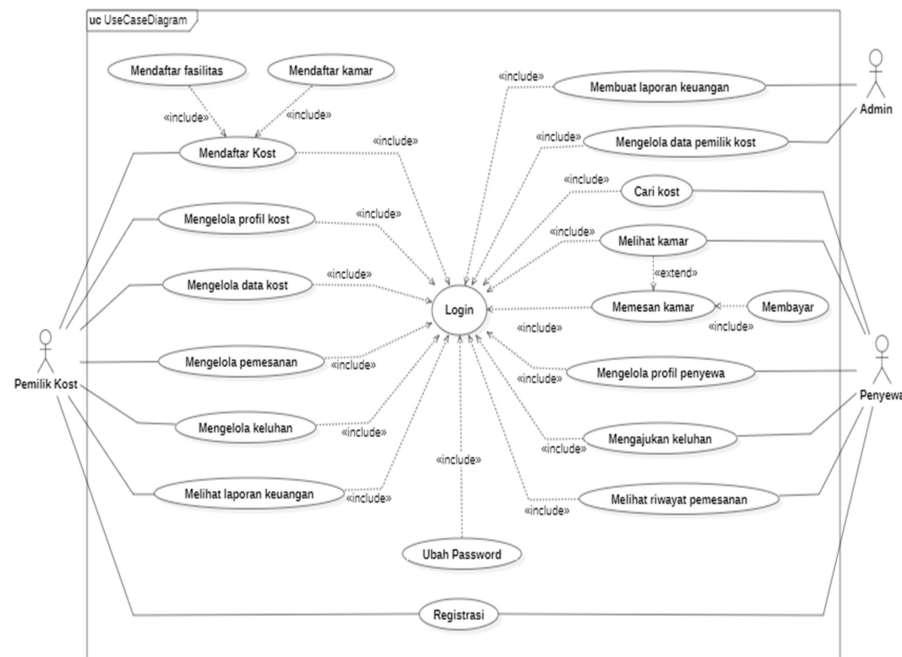


Figure 3. Use Case Diagram

3.3 Development

After the analysis and design stages have been completed, the implementation stage is carried out to develop features in accordance with the analysis that has been determined.

3.3.1 User side

a. Login

Users must login first, before accessing the main features of the system.

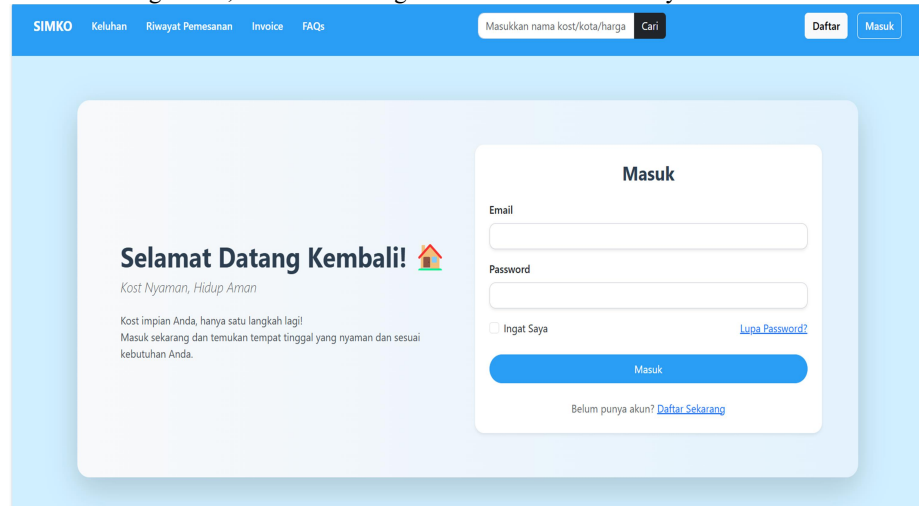


Figure 4. Login Page - SIMKO

Users are required to log in before accessing the main features of the system. This step ensures secure access and personalized user experience. By entering a registered email or username and password, the system can verify the user's identity. Once authenticated, users can access all functionalities, such as

searching for boarding houses, making bookings, managing profiles, and viewing order history in a secure and organized manner.

b. Homepage

After the user successfully login, the user will be directed to the homepage.

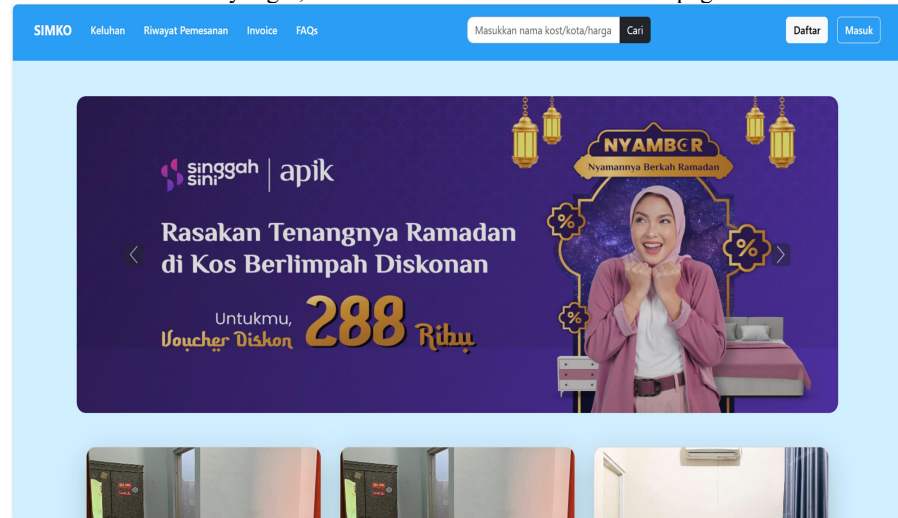


Figure 5. SIMKO Homepage

After successfully logging in, users are directed to the homepage, which serves as the main interface of the e-boarding house application. The homepage is designed to be intuitive and user-friendly, providing quick access to the core features of the application. Users can easily navigate through available boarding house listings, use the search function to filter by location, price, or facilities, and view promotional offers if available. It also displays personalized recommendations based on the user's previous searches or preferences. Important notifications such as booking confirmations, payment reminders, or updates from boarding house owners are also shown on this page. The layout is structured to ensure convenience, allowing users to begin their experience smoothly and efficiently. Whether the user wants to browse options, continue a previous booking, or check the latest updates, the homepage acts as a central hub that connects all essential functionalities of the application in a seamless manner.

c. Order history

Users can view information related to bookings that have been made previously on this page.

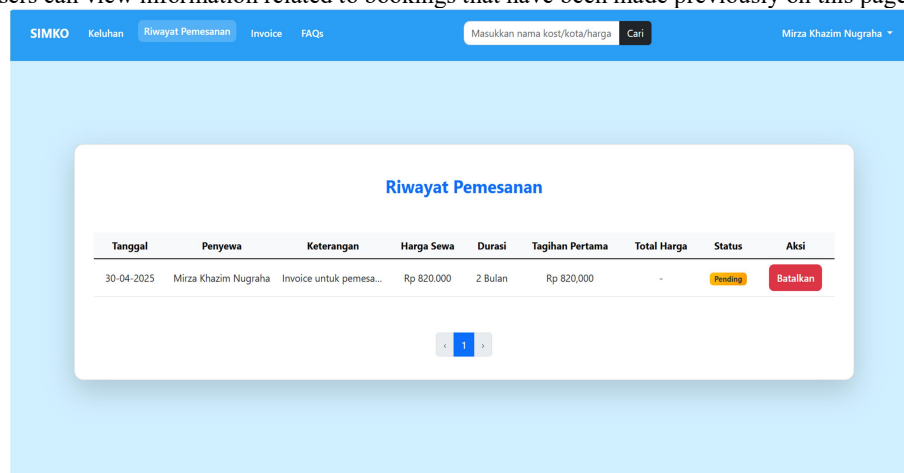


Figure 6. SIMKO Order History

The *Order History* feature provides users with easy access to a complete record of their previous bookings. On this page, users can view detailed information such as the name of the boarding house, check-in and check-out dates, payment status, and other relevant transaction details. This feature not only helps users track their past activities, but also serves as a useful reference for future bookings or when clarification is needed regarding previous transactions. With a clean and organized interface, users can navigate their booking history efficiently, ensuring transparency and better management of their accommodation plans.

d. Invoice

Users can view information related to payments that have been made previously on this page.

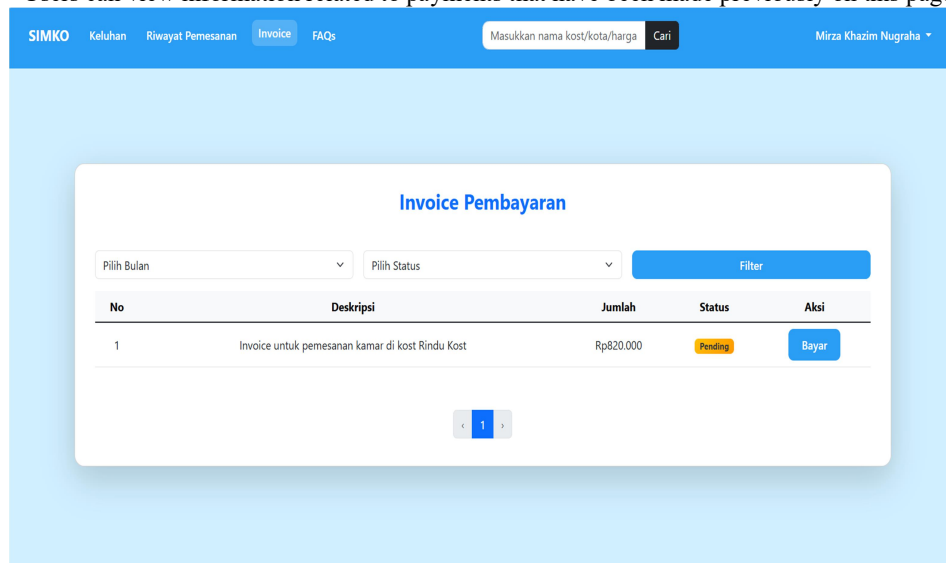


Figure 7. SIMKO Invoice History

3.3.2 Admin side

a. Dashboard

After login, the admin will be directed to the dashboard, in the dashboard there is some information displayed through the score card so that it speeds up the admin in receiving the latest information.

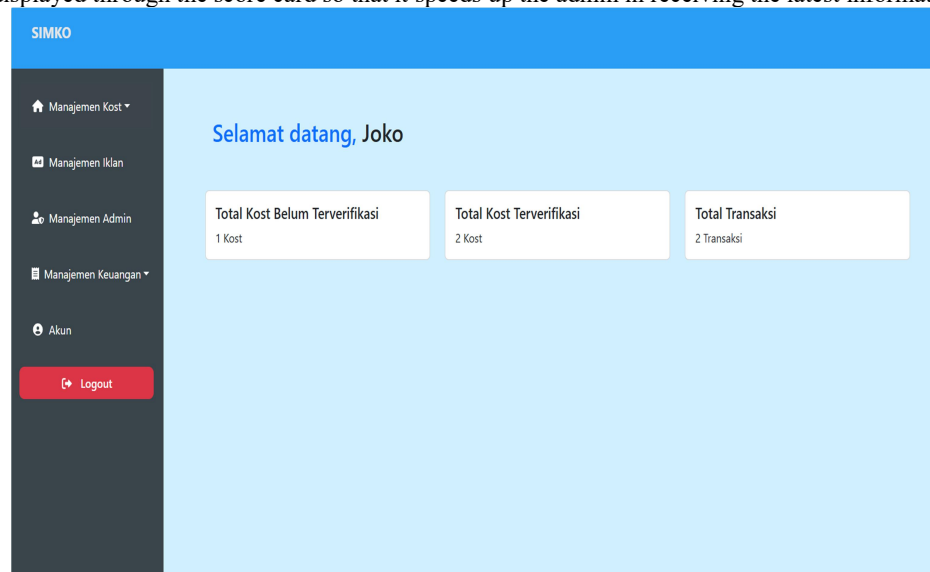


Figure 8. Adminpage Simko

3.3.3 Owner side

a. Dashboard

After login, the owner will be directed to the dashboard, in the dashboard there is some information displayed through the score card so that it speeds up the owner in receiving the latest information.



Figure 9. Ownerpage Simko

3.4 Testing

To verify that the system functions according to its intended purpose, the author applies the Blackbox testing method to evaluate the designed and implemented system procedures, with the results presented in a tabular format.

Table 1. *Blackbox Testing for Login*

No	Test Scenario	Test case	Expecting Result	Testing Result	Conclusion
1.	Performing login without filling one of the input fields	Email: <u>user@gmail.com</u> Password: (empty)	Displays alert below the empty input field: "attribute cannot be empty"	As expected	Valid
2.	Performing login with unregistered email and password	Email: <u>user@gmail.com</u> Password: <u>Ustertest_1</u>	Displays notification: "email or password does not match"	As expected	Valid
3.	Performing login with registered email and password	Email: <u>user@gmail.com</u> Password: <u>Ustertesting1</u>	Displays page according to role and notification "login successful"	As expected	Valid
4.	Performing login without including @ in the email	Email: <u>user.com</u> Password: <u>Ustertesting1</u>	Displays alert below the email input field: "invalid email format"	As expected	Valid
5.	Performing login with wrong password format	Email: <u>user@gmail.com</u> Password: <u>12345678</u>	Displays alert below the password input field: "attribute must contain at least 8 characters, one letter, uppercase and	As expected	Valid

lowercase letters, and a number" according to the incorrect format

Table 2. *Blackbox Testing for Order History*

No	Test Scenario	Test case	Expecting Result	Testing Result	Conclusion
1.	Selecting the "Booking History" menu on the homepage	User is logged in as a tenant and accesses the order history menu	The system successfully displays the order history data that has been made	As expected	Valid
2.	Clicking the "Cancel" button on the booking history page	User select the cancel button	The system successfully deletes the order data and displays a notification: "The booking has been successfully canceled"	As expected	Valid

Table 3. *Blackbox Testing for Invoice History*

No	Test Scenario	Test case	Expecting Result	Testing Result	Conclusion
1.	Selecting the invoice menu on the homepage	User is logged in as a tenant and accesses the order history menu	User is logged in and accesses the invoice page from the homepage	As expected	Valid
2.	Clicking the "Pay" button on the invoice page	User select the cancel button	User clicks the "Pay" button on an unpaid invoice	As expected	Valid

3.5 Deployment

The deployment process is a crucial stage aimed at moving the application from the development environment to the production environment so it can be accessed online by users. The system was built using Laravel as the framework and MySQL as the database. The Agile methodology was applied during development, allowing for flexible and iterative implementation based on evolving needs. Deployment was carried out using Arenhost services, which included configuring the .env file to match the production server settings, creating the database schema, and setting up the database connection.

3.6 Review

At this stage, the developed system was evaluated based on feedback from users, including boarding house owners and tenants. The review process was conducted through discussions and direct testing of SIMKO's features. According to the review results, the system is considered to meet user needs. All implemented features align with the business processes identified during the analysis phase.

4. Conclusion

This research aims to develop SIMKO, a web-based boarding house management information system, to answer the challenges of digitalization in boarding house management. Using an Agile approach and the Laravel framework, the system is designed to solve key problems such as manual record keeping, inefficient booking processes, and limited communication between tenants and owners. SIMKO offers integrated features for three main user roles-owners, tenants, and administrators-and supports digital payments through integration with Xendit, thus improving overall management performance and transparency.

Based on the evaluation conducted during the review phase, which involved hands-on testing with boarding house owners and tenants, the system has met the users' needs. All implemented features correspond to the business processes identified during the analysis stage, ensuring that the system supports real-world workflows and operational requirements.

As a suggestion, future development of SIMKO could include the integration of real-time notifications to improve communication between users, as well as the development of a mobile app to improve accessibility. In addition, an increased focus on system security and infrastructure readiness will be crucial to maintain stability as the number of users and transactions increases along with technological advancements.

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