

DEVELOPMENT OF INFORMATION SYSTEM FOR BOARDING HOUSES

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ABSTRACT

The management of boarding houses through manual bookkeeping still faces many challenges, such as recording errors, difficulty in monitoring room availability, and inefficiencies in communication between the manager and tenants. boarding houses face these issues, which can potentially lead to conflicts due to misinformation regarding billing and room status. To address these problems, this study aims to develop a web-based boarding house management information system integrated with WhatsApp as a billing notification tool. This system is designed to reduce recording errors, improve room management efficiency, and facilitate communication between tenants and the boarding house manager. With the implementation of this system, it is expected that boarding house managers can easily access tenant data, monitor room status in real-time, and automate the billing process for tenants. The expected outcome of this system development is improved efficiency in boarding house management, increased data recording accuracy, and ease of monitoring and communication.

Keyword : *Information System Of boarding houses, Management system, Billing system*

1. INTRODUCTION

Effective and efficient boarding house management has become a primary need in the digital era. boarding houses still relies on a manual bookkeeping system to record building, room, tenant, and billing data, which is prone to recording errors and delays in information. These errors can lead to conflicts between tenants and managers, complicate room availability and billing monitoring, and potentially reduce the boarding house's revenue.

To address these issues, a web-based boarding house management information system is needed to enhance efficiency and recording accuracy. Integration with WhatsApp is also proposed to facilitate automatic billing notifications for tenants. With the implementation of this system, boarding house management is expected to become more accurate, efficient, and improve communication between tenants and managers.

2. LITERATURE REVIEW

2.1. Information System

A system is an integration of various components, as it provides different recommendations for each case that occurs within it. Damage to any part of the system can disrupt tasks and impact the effectiveness of achieving objectives.

Information refers to data that has been processed into a more meaningful and useful form for its recipients, enabling them to make decisions in the present and future. Information is the result of data processing, where raw data is transformed and integrated into something meaningful for decision-making. It is also defined as a collection

of logically structured data that is relevant to one or more individuals at a given time. Information is processed data that serves as a foundation for making informed decisions.

An Information System is a collection of individuals working together to achieve a specific goal. Additionally, an Information System supports decision-making processes. It can also be defined as a structured combination of individuals, hardware, software, computer networks, data communication, and databases that work together to collect, distribute, and transform information into a usable form [1].

2.2. Website

A website can be defined as a collection of pages containing digital data information in the form of text, images, animations, audios, videos, or a combination of these, which are provided through an internet connection so that they can be accessed and viewed by people all over the world. Website pages are created using a standard language called HTML. This HTML script is interpreted by a web browser, allowing it to be displayed as readable information for everyone [2].

Furthermore, a website is a collection of pages that can display text, images, animations, videos, and audio, all interconnected within a network of pages. There are two main types of websites: static websites and dynamic websites. Another perspective on websites is that they are an internet service that enables data and document exchange both locally and remotely. A website consists of web pages that contain data or documents. These pages can communicate within a single server or interact with servers worldwide, depending on the

access permissions granted. These pages are accessed through a browser application [3].

2.3. HTML

HTML is a programming language used on the web in document format and connects dynamic hypertext to other documents stored on different computers. HTML is a highly suitable language for displaying information on web pages. It presents information in the form of hypertext and also supports a set of commands that can be used to control the appearance of that information [4].

2.4. CSS

Cascading Style Sheet (CSS) is a programming language designed to enhance and style the appearance or layout of web pages, making them more elegant and visually appealing. CSS is a standalone document that can be embedded within HTML code or referenced by HTML to define styles. CSS offers more capabilities compared to core programming languages like HTML and PHP. With CSS, users can control text color, font types, line spacing between paragraphs, column sizes, and background styles. Additionally, CSS enables the design of layouts, adaptive display variations across different devices, and the implementation of various visual effects on a website [5].

2.5. PHP

PHP (Hypertext Preprocessor) is an open-source programming language used to develop dynamic and interactive web applications. PHP runs on a web server and can be combined with HTML, CSS, and JavaScript to create dynamic web pages. PHP is highly popular among web developers due to its ease of learning and powerful capabilities. This programming language supports various databases such as MySQL, PostgreSQL, and Oracle, allowing developers to build more complex and functional web applications [6].

2.6. Java Script

JavaScript is a popular programming language used to create dynamic and interactive web pages. It was created by Brendan Eich in just 10 days in September 1995 while working at Netscape. Over time, JavaScript underwent several name changes, from Mocha to LiveScript, before finally being named JavaScript.

Its development continued with standardization as ECMAScript in 1996, followed by the release of ECMAScript 2 in 1998 and ECMAScript 3 in 1999. Today, JavaScript has become the backbone of modern web development, with 92% of websites using it by 2016 [6].

2.7. Laravel

Laravel is a PHP framework released under the MIT license and initially developed by Taylor Otwell. It is built on the MVC (Model-View-Controller) concept. Laravel is an MVP-based web development framework written in PHP, designed to enhance software quality by reducing initial development costs and maintenance expenses while improving overall efficiency [7].

2.8. Database

A database is a collection of data that is managed in such a way based on specific rules, ensuring interconnectivity and ease of management. Through this management, users can easily search for, store, and delete information [8].

2.9. MySQL

MySQL is an open-source Database Management System (DBMS) tool that supports multi-user and multi-threaded operations. It is popular and free to use. Based on the above theory, SQL can be defined as a specific database query language, where its sub-language allows for the creation and manipulation of data within a database. SQL is used to perform tasks such as updating databases, adhering to the concept of a Relational Database Management System (RDBMS) [9].

2.10. Boarding Houses

For people who continue their education or work in a different area away from their hometown, housing is a primary necessity. Those with a high economic status typically choose to live in apartments, guest houses, or even hotels. However, individuals with a middle to lower economic background usually opt for rented rooms, commonly known as "indekos" or boarding houses. "Indekos" refers to a type of rental room that is leased for a specific period based on an agreement between the room owner and the tenant, with a predetermined price [9].

3. RESEARCH METHOD

3.1. Menu Structure

The main menu on the web page consists of Dashboard, Building Settings, Room Settings, Tenants, Payment Entry, Billing, Tenant Statistics, Occupancy Rate, and Revenue Reports, each serving to facilitate user navigation. Figure 1 shows that accessing the website requires logging in first. Once logged in, users will be directed to the dashboard page, from which they can navigate through various menus displaying relevant information. Additionally, in the Payment menu, there is a button to access the Payment Processing menu, which handles the actual payment process.

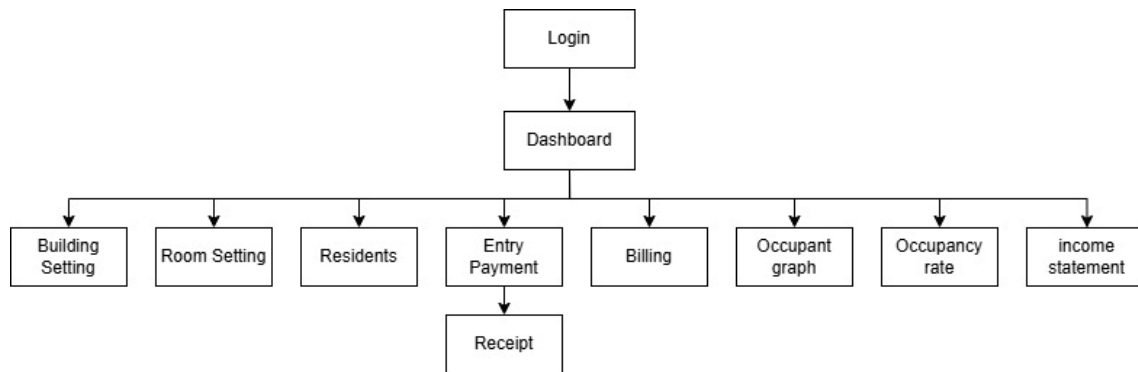


Figure 1. Menu Structure

3.2. ERD

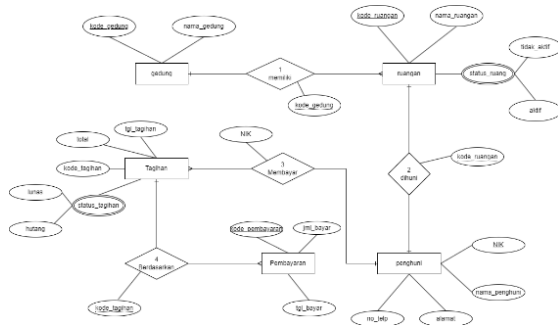


Figure 2. ERD

This Entity-Relationship Diagram (ERD) illustrates the boarding house management system, covering building, room, tenant, billing, and payment data. A building consists of multiple rooms, which can be occupied by tenants identified by their NIK (National Identification Number). Each tenant receives a billing record that includes total amount, billing date (*tgl tagihan*), and billing status (paid or outstanding).

Payments are processed based on the billing records through the Payment entity, which records the payment code (*kode_pembayaran*), payment date (*tgl_bayar*), and payment amount (*jml_bayar*). The relationships among these entities represent a systematic flow of boarding house management, ensuring structured data handling and efficient operations.

3.3. DFD

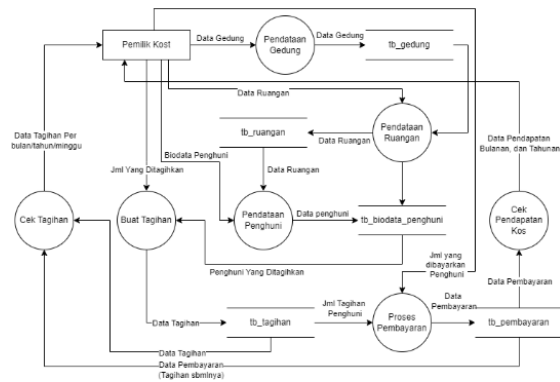


Figure 3. DFD

Figure 2 illustrates the data management flow in the boarding house information system. The boarding house owner can input and update data related to prospective tenants, current tenants, buildings, rooms, and payments. Tenant data is stored in the *tb_biodata_penghuni* and *tb_penghuni* tables, while building and room information is recorded in the *tb_gedung* and *tb_ruangan* tables. Any data modifications are carried out through an update process, replacing old information with new data. Additionally, tenant payment transactions are recorded in the *tb_pembayaran* table. This data management process ensures the accuracy, integrity, and real-time updates of information within the boarding house system.

4. DISCUSSION DAN RESULT

The boarding house information system consists of various menu pages, including Dashboard, Building Settings, Room Settings, Tenant Settings, Payment Entry, Billing, and Revenue Reports for Each Building. This system features only one user type, the boarding house manager, and can only be accessed by the manager to ensure controlled and secure management of the boarding house operations.

4.1. Dashboard

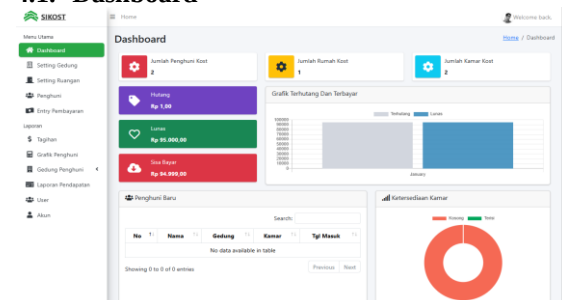


Figure 4. Dashboard

The dashboard page is used to display summarized data representations, including the total number of boarding rooms, total tenants, total boarding houses, total revenue, total outstanding debt, remaining payments, and room availability.

4.2. Room Settings

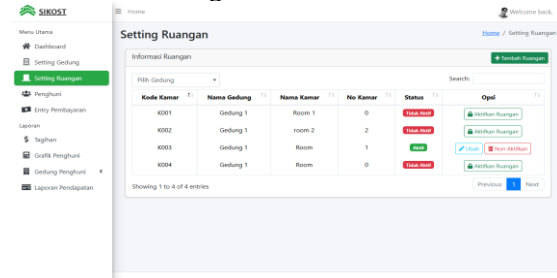


Figure 5. Room Settings

The Room Settings Page is designed to help boarding house managers efficiently manage room data, ensuring that each tenant is properly recorded in the system. The "Room Data Settings" feature in the boarding house information system is developed to streamline room information management. A user can perform CRUD (Create, Read, Update, Delete) operations on room data, which is directly linked to building data.

During the data entry process, users can select the associated building from a dropdown menu, ensuring that newly added rooms are correctly linked to a specific building. Additionally, managers can input room details, including room name, room number, and capacity, to ensure accurate and comprehensive data recording.

4.3. Residents

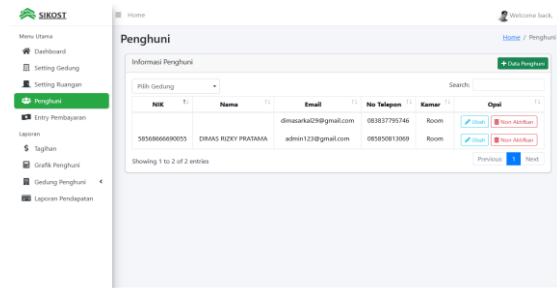


Figure 6. residents

4.5. Test

Table 1. Scenario Of Add Room

No	Test Scenario	Test Case	Expected Result	Testing Result
1	Add room data with valid data	Building: Building 1 Name Room: Room 1 Number Room: L1 Room Capacity: 1	The data is successfully saved, and a success message appears	Accepted
2	Empty fields are not filled in	Empty Field	A validation message "This field is required" appears on all mandatory inputs..	Accepted
3	The room capacity is filled with letters	Building: Building 1 Name Room: Room 1 Number Room: L1 Room Capacity: ABC	The data will be saved to the database but will appear with a value of 0	Accepted
4	The room capacity is filled with a negative value	Building: Building 1 Name Room: Room 1 Number Room: L1 Room Capacity: -1	The data is saved but the value becomes 0	Accepted

The residents page in the boarding house information system is designed to facilitate structured tenant data management. On this page, users can view a list of tenants along with essential details such as NIK (National Identification Number), name, email, phone number, and the room they occupy. These columns enable manager to quickly monitor tenant identities and contact information, as well as track room assignments. Additional features like search and data sorting further assist administrators in efficiently locating specific tenant information.

4.4. Billing

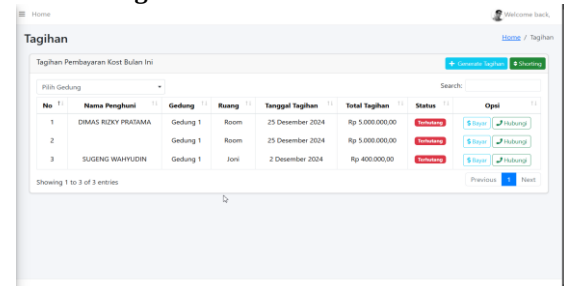


Figure 7. Billing

The Billing menu is designed to monitor and manage tenant payments efficiently. It displays a table view containing comprehensive information, including Tenant Name, Building, Room, Billing Date, Total Amount, and Payment Status (e.g., Outstanding or Paid). This menu features a dropdown filter to sort billing data by building. Additionally, it includes a "Generate Bill" button to automatically create new bills, as well as "Pay" and "Contact" buttons. The "Pay" button directs manager to the payment processing page, while the "Contact" button allows direct WhatsApp communication with tenants for payment reminders.

Table 2. Scenario Of Add Residents

No	Test Scenario	Test Case	Expected Result	Testing Result
1	Add resident data with valid data	NIK: 098765434567876 Email: dimasrkal29@gmail.com Price: Rp 2.500.000 Register Date: 25/11/2024	Resident data has been successfully saved and appears in the resident list	Accepted
2	Add data without filling in all fields	Empty Field	A validation error message appears such as "The NIK field must be filled in".	Accepted
3	Selecting a room that is not available	Rooms was booked	Can not Change	Accepted
4	Didn't choose the room and building	Rooms and buildings are not selected	The system will display an error pop up	Accepted

5. CONCLUSION AND SUGGESTION

The web-based information system for managing boarding houses has been successfully developed with key features that integrate resident, room, and billing data. It enables seamless management of buildings, rooms, and tenants on a single, easily accessible platform. The bill notification via WhatsApp facilitates communication regarding payments, while the web-based system implementation reduces the risk of manual recording errors and enhances data accuracy. Real-time room monitoring accelerates the rental process for vacant rooms, and the revenue reporting feature assists administrators in effectively tracking finances. The user-friendly interface allows boarding house managers easy to operate the system easily. Test result shows that the system can handle various boarding house management scenarios with satisfactory results, making resident data more structured and minimizing potential conflicts due to misinformation. Overall, this system enhances boarding house management efficiency and provides a better experience for tenants.

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