

DESIGN AND DEVELOPMENT OF A LOCATION-AWARE WEB-BASED BOARDING HOUSE SEARCH AND BOOKING SYSTEM USING EXTREME PROGRAMMING

Muhammad Arif Furqon¹, Sudewi²

Study Program of Information Systems, Institut Bakti
Nusantara, Lampung
Wisma Rini Street, No. 09, Pringsewu, Lampung,
Indonesia

*Corresponding author
farif9831@gmail.com

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Abstract

The increasing demand for affordable and accessible boarding houses among students and workers highlights the need for efficient digital accommodation services. Conventional boarding house searches often involve limited information, manual visits, and difficulties in comparing rental prices, facilities, and locations. This study aims to design and develop a mobile-responsive web-based boarding house information and booking system in Pringsewu, Indonesia, integrating accommodation categorization, online reservations, and location-based search functionality. The system was developed using the Extreme Programming (XP) methodology, supported by Unified Modeling Language (UML) diagrams and a MySQL database. Data requirements were identified through observations, interviews, and literature reviews involving prospective tenants and boarding house owners. The proposed system incorporates six primary interfaces: homepage, boarding house categories for male and female tenants, accommodation listings, property details, online booking, and geographical location visualization. Location-based features provide information on boarding house proximity to Pringsewu City Center, enabling users to evaluate accommodation accessibility. The resulting system design demonstrates an integrated approach to improving accommodation information accessibility, simplifying reservation workflows, and supporting digital property promotion. The proposed platform provides a foundation for user-centered boarding house management and future evaluation of usability, functionality, and booking efficiency.

1.0 INTRODUCTION

The rapid development of information technology today has changed various aspects of people's lives, including in the field of providing temporary housing such as boarding houses (Chalidazia N, 2021). In Indonesia, especially in urban areas and around campuses, the need for temporary housing is increasing as the number of students, students, and migrant workers

increases. Based on data from the Central Statistics Agency (BPS) in 2022, it was recorded that around 9.96% of households in Indonesia occupy rental or rented houses. This percentage shows that there are still many people who do not have their own houses, so they choose alternative temporary housing such as boarding houses. In the DKI Jakarta area, for example, the percentage of rented residents reached 30.94% of the total households, while home ownership was only around 50.67%. This condition shows that the rental housing system is one of the main needs in densely populated urban areas. A similar phenomenon also occurs in the city of Bandar Lampung, which is one of the centers of education and economic activity in Lampung Province. The number of universities and schools in this area encourages an increase in demand for boarding houses. Students and workers from various regions come to the city to study and work, so the demand for temporary housing increases from year to year (Baby Lolita B et al, 2022). However, the process of finding a boarding house is still done manually, such as asking directly to local residents, looking at bulletin boards, or getting information from friends and relatives. This conventional method is certainly inefficient because it requires time and effort, and often the information obtained is incomplete and difficult to update. Apart from the side of boarding house seekers, boarding house owners also face obstacles in marketing their properties. Most boarding house owners still rely on traditional promotions such as installing banners, banners, or distributing brochures in campus areas. These methods are limited to the range of locations and require additional costs. As a result, information about room availability is often not widely conveyed, while prospective tenants must visit locations one by one to ensure that the boarding house conditions suit their needs. This situation shows that there is no system that is able to bridge the needs of both parties digitally and integrated. With the rapid development of internet technology and web-based services, there is a great opportunity to overcome these problems through a website-based information system. This system can display complete information about boarding houses, ranging from room descriptions, facilities, prices, locations, to room availability that is updated in real time. Boarding house seekers can also make payment transactions if the boarding house owner has approved it (Jumardi A, 2022). In addition, integration with features such as Google Maps will make it easier for users to visually trace the location of the boarding house, while the use of WhatsApp API can speed up the communication process between prospective tenants and boarding house owners. Thus, this system not only provides convenience for boarding house seekers, but also becomes an effective digital promotional medium for owners.

The implementation of a web-based boarding house search and booking information system will have a positive impact on both parties. Prospective tenants can easily find boarding houses based on the desired location and facilities without having to come directly to their place. Boarding house owners can update information independently and reach potential tenants more widely. In addition, the digitalization of this system is also in line with the development of the digital economy in Indonesia, where people are increasingly accustomed to using online applications to meet various needs, including in the property and residential sectors. Seeing these problems, this research is important to design and implement an Online Search and Registration Information System for Website-Based Boarding House Success. This system is expected to be an innovative solution in digitizing rental housing services, providing easy access for users, and increasing the competitiveness of boarding houses in the era of digital transformation. With this system, the boarding house rental process can be carried out more efficiently, transparently, and modernly.

2.0 METHODOLOGY

2.1 Data Collection Methods

1. Observation

Observation is an observation that shows a study or learning that is carried out deliberately, directed, sequentially, and according to the goals to be achieved in an observation that records all events and phenomena called observation results, which are explained in detail, thoroughly, precisely, accurately, usefully, and objectively in accordance with the observations made. (Suhailasari, 2021). The author conducted an observation at one of the boarding houses in Sridadi village, Kalirejo District, precisely in Sukses Kost on Wednesday, May 15, 2024. The data obtained from the observation results is about the way of advertising boarding houses which are still considered less

efficient for boarding house seekers because they are just putting up promotional boards. Boarding house seekers still have to conduct a direct survey.

2. Interview

The researcher conducted interviews with migrants/students who were looking for boarding houses and boarding house owners in Kalirejo district, one of which was at Sukses Kost in Sridadi village, Kalirejo District with a resource person named Mr. Akhmad Durori on Wednesday, May 15, 2024 with the results of interviews with boarding house owners in general still promoting their boarding houses in manual ways such as "Accept Kost" in front of the house, installing banners. Where this is still not efficient because sometimes boarding house seekers do not know the boarding house. Meanwhile, the results of interviews from boarding house seekers who are now boarding houses there as well, in general they get information about boarding houses from references from relatives, friends, and information from promotional boards. The rental system is generally carried out annually.

3. Library

The results of various previous studies have found that currently the available system for finding and booking boarding houses is still few and in general the promotion of boarding house owners is carried out by manually placing advertisements on banners, etc.

2.2 System Development Methods

This study uses the waterfall system development method.

1. Analysis

Software Needs Identify problems with the management of the boarding house rental system that is still manual. Identify the solution to the problem of renting a boarding house by designing a website-based system. Identify the needs of system users, namely prospective tenants or residents and owners of boarding houses.

2. Design

The design included the design of the database by making an ERD diagram using the visio 2013 software, making the architectural design using UML diagrams using visual paradigm tools, making the user interface design using the visual paradigm and dreamweaver tools, designing the database using the apache web server. This stage is the integration of software needs and the needs analysis stage into the design representation so that it can be implemented into a program at the next stage

3. Implementation Creation

At this stage, the compiler writes a program or code that can be understood by a computer to support the creation of a program to support the creation of a program, the design of the software is realized as a series of programs or program units.

4. Testing

Testing is carried out using *black box testing*, *black box testing* is carried out to determine the validation of the system accessed by users. Identify solving problems for renting boarding rooms by designing a website-based system. Identify the needs of system users, namely prospective tenants or residents and owners of boarding houses.

3.0 RESULTS

3.1 System Design

The system design uses an object-oriented modeling method with UML (Unified Modelling Language) modeling tools.

Use Case Diagram

Use case diagrams are used to visualize business processes based on the perspective of system users. The goals of the use case include defining the functional and operational needs of a system by defining the agreed use scenarios between the user and the developer presenting functional features on the side of the system administrator.

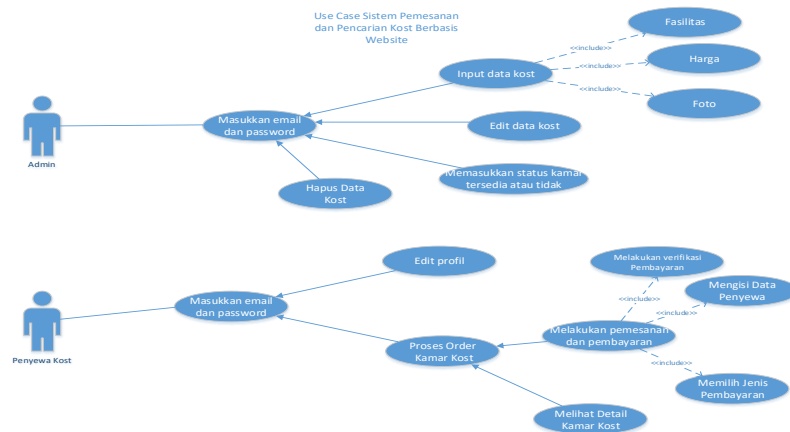


Figure 1. Use Case Diagram

The image shown is a use case diagram that illustrates the interaction between actors (users) and systems in the context of Educational Game Registration. There are two main actors in this diagram, namely User (general user) and Administrator. For general users, the process starts with the "Register for Educational Game" use case, which includes activities such as entering account data and filling in personal data. After that, the system will save the data into a database, consisting of account data, price, and photos. After the registration process is complete, users can log in to the system. After logging in, users can access the "Game Code Input" feature and get information related to the status and validation of the game code, as well as notifications whether the code is successfully used or not.

Meanwhile, the Administrator actor has a more complex role. Administrators can "View all participant data", which includes viewing participant profile data and code verification status. In addition, administrators can also perform "Game Card Printing Process", which includes verifying participant data, printing game cards, and submitting the printouts. Administrators can also manage submissions and view the status of the card submissions. Overall, this diagram illustrates the structured flow of the system from the registration process to the printing and delivery of the Education Game Card, by differentiating the roles and responsibilities between ordinary users and administrators.

Activity Diagram

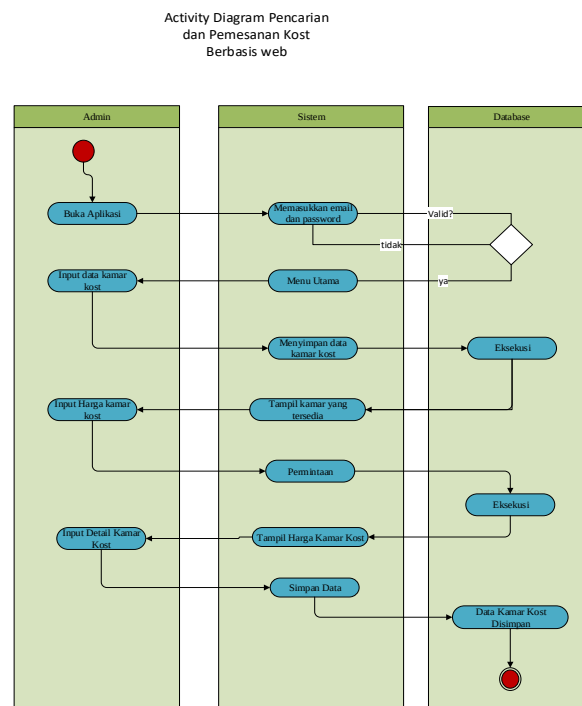


Figure 2. Activity Diagram

The process starts with the user logging in to the system. After successfully logging in, the user can search for the boarding house, which is then processed by the system to display the list of available boarding houses. Next, the user can see the details of the boarding house of interest. At this stage, the system will check the availability data from the database, and the results of this check can be in the form of available or unavailable boarding houses. If the boarding house is available, then the system allows the user to make a reservation. After the booking is made, the booking data will be stored in the database, and the system provides a notification to the user in the form of the results of the booking process. Finally, the system displays the status of the order, and the process is complete. Overall, this diagram describes a fairly structured flow from the login, search, to boarding house booking process that is interconnected between users, systems, and databases. This diagram makes it easy to understand how web-based boarding house systems work from a functional point of view.

Class Diagram

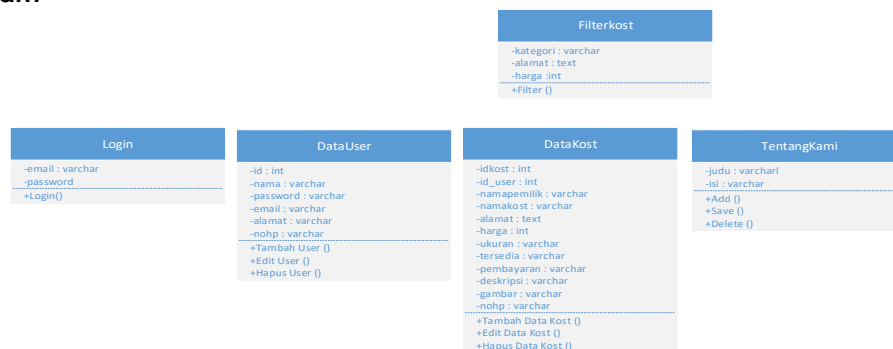


Figure 3. Class Diagram

This diagram consists of five main entities, namely Login, DataUser, Evaluation, Timeofgame, and History, each of which has essential attributes to support system functionality. The Login table stores user authentication data, such as id_login, username, password, and usertype, which indicates the type of user (e.g., user or admin). The DataUser table is a data center for users' personal data that includes id_user, nama_lengkap, jenis_kelamin, address, email, phone, and additional data such as kode_game and tanggal_daftar. Furthermore, the Evaluation table serves to store the results of user evaluations of educational games. The attributes are quite complete, such as id_eval, id_user, nama_game, material, grades, feedback, and dates, which support assessments based on materials and user scores. This table is directly related to DataUser through id_user.

The Timeofgame table records user interaction data on the game, including id_waktu, id_user, nama_game, lama_bermain, and dates, which are important for evaluating the duration of user engagement in the game. The History table keeps a general record of user activity towards the game, including id_riwat, id_user, nama_game, tanggal_main, skor_akhir, and feedback, as an archive that supports the continuous monitoring and analysis process. Overall, this ERD shows a systematic and interconnected data structure, so that it is able to support educational game management systems, ranging from login, personal data recording, tracking play activities, to evaluation and feedback from users.

Sequence Diagram

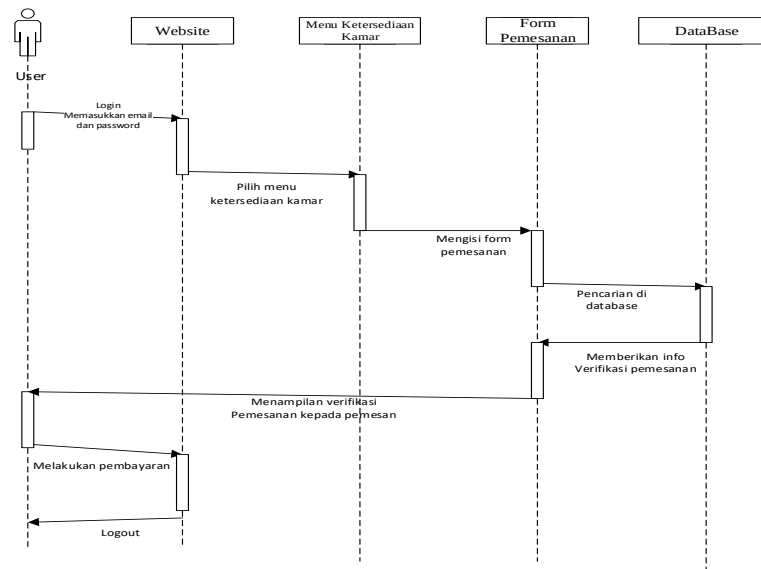


Figure 4. Sequence Diagram

This diagram shows how a user interacts with several components of the system, namely the Website, Boarding House Service Menu, Order Form, and Database, in order to book a boarding house. The process begins when the user accesses the website and selects the boarding house service menu, which then displays a list of available boarding houses. After that, the user will select one of the boarding houses and enter the booking form to fill in the required data. The data input by the user is then sent to the database to be stored and verified. After the storage process is successful, the system will display a notification or information that the order has been successfully placed. Furthermore, the user can make a payment in accordance with the applicable conditions. After the payment is completed, the process is closed with the user logging out of the system. Overall, this diagram explains the logical and systematic sequence of the steps of booking a boarding house online, starting from choosing a boarding house, filling in the data, saving it to a database, to the final stage in the form of confirmation and logout. This diagram is very useful for visualizing the flow of the system and making it easier for developers and users to understand the process.

3.2. Implementation

The image shows the initial page of the Kost Pringsewu. On this page, users are greeted with a Welcome message and directed to select the available rooms. There are several room options that are displayed in the form of images along with their names or descriptions. Each room has a different appearance according to the facilities and conditions offered. This view makes it easy for users to visually see the condition of the room before deciding to make a booking. With a neatly arranged list of rooms, users can compare and choose rooms according to their needs and preferences. This page serves as the main interface for the online boarding room selection process.



Figure 5. Data Page

The image displays the room booking details page on the Kost Pringsewu application. On this page, you can see complete information about the rooms offered, including room photos, monthly rental prices, and descriptions of available facilities. This information includes details such as room size, location, and supporting facilities such as electricity, water, and applicable regulations. There is also a Book button that allows users to continue the booking process after confirming the choice of room that suits their needs. This page is designed so that prospective tenants can get clear information before making a transaction, so that it can help in making the right decision.

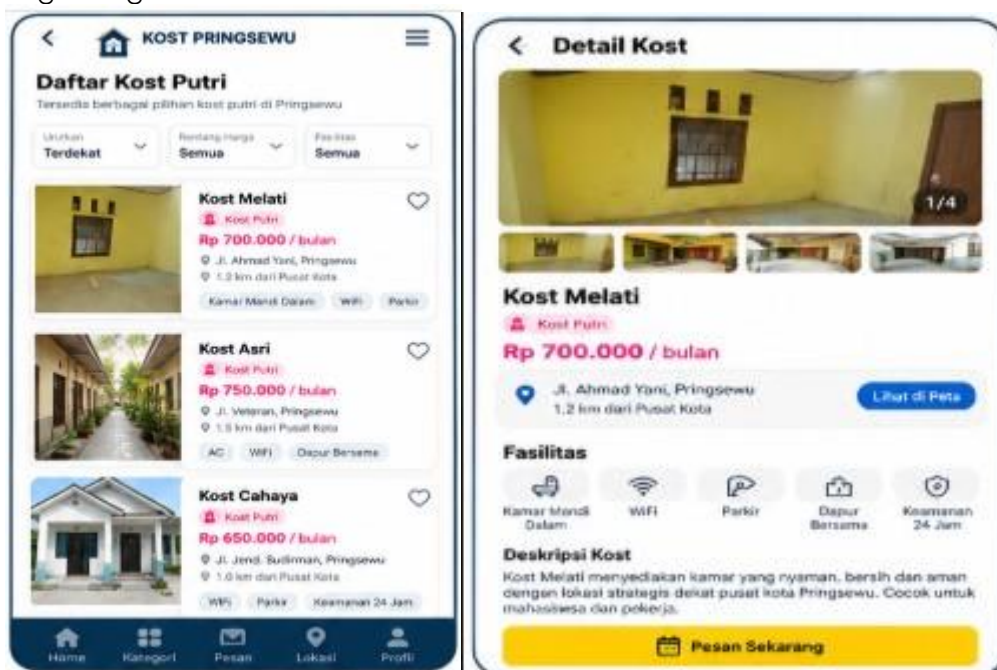


Figure 6. Profile Design

The image shows the Profile page on the Kost Pringsewu application. This page functions to display and manage the user's personal information which includes name, address, and phone. The data is displayed in the form of text fields that can be edited as needed. In addition, there is an option to change the profile by pressing the Change Profile link and changing the

password through the Change Password link. At the bottom, there is a Back button that directs users to the previous page. This page is important to maintain the accuracy of user information and make it easier to manage accounts to match the latest data.

4.0 CONCLUSION

Based on the results of the research and implementation carried out, it can be concluded that this web-based boarding house search and booking information system has been successfully built and functions well. This system is able to be a medium of information, promotion, and marketing for boarding house owners digitally, which can be accessed anytime and anywhere. For boarding house seekers, this system simplifies the process of finding a place to live according to needs through the location, facilities, and price search features. Meanwhile, for boarding house owners, this system is an efficient means of promotion without the need to use conventional methods. Thus, the rental process becomes faster, transparent, and effective, and supports the increase in the digitalization of services in the simple housing sector. Overall, this study shows that the application of information technology in the field of boarding house rental has a positive impact on service efficiency and ease of access to information. By adopting a web-based system as developed in this study, it is hoped that a digital ecosystem can be created that encourages the transformation of simple property services to be more modern, transparent, and highly competitive in today's digital era.

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