

KOST APPLICATION AND BOARDING HOUSE PAYMENT TRANSACTIONS IN TALANG PADANG DISTRICT BASED ON GEOLOCATION

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Abstract

Utilizing web-based applications is one way that science and technology makes it easier to find information as progress continues. To find temporary housing that meets the criteria, boarding house seekers must search for boarding houses more quickly and accurately because the number of boarding houses available is often less than the comparison of boarding house seekers. However, there are still many boarding house managers who advertise their business physically, for example by distributing pamphlets or promoting by word of mouth. As a solution to the problems above, the researcher intends to develop an e-boarding application and boarding house payment transactions. This research collects data from literature, interviews and observations and uses a Waterfall approach to design the system. A useful website that helps customers choose the ideal boarding house is the result of this research.

1.0 INTRODUCTION

The rapid advancement of information and communication technology has significantly transformed how individuals access information, interact with service providers, and conduct transactions through digital platforms. Web-based information systems have become essential tools for improving information accessibility, operational efficiency, and service delivery across various sectors. The increasing adoption of smartphones and mobile internet technologies has further accelerated the transition from conventional information services to digital platforms that can be accessed anytime and anywhere. According to Venkatesh et al. [1], technology adoption is influenced by performance expectancy, effort expectancy, facilitating conditions, and other behavioral factors that determine users' willingness to utilize digital services. Furthermore, DeLone and McLean [2] emphasize that information quality, system quality, and service quality are fundamental determinants of information system success. These developments demonstrate the importance of designing accessible, reliable, and user-oriented web-based applications to address the growing demand for efficient information services, particularly in the residential accommodation sector.

The increasing demand for temporary accommodation, particularly among university students, employees, and individuals relocating for educational or professional purposes, has created challenges in accessing accurate and comprehensive boarding house information. Conventional boarding house searches often depend on physical visits, personal recommendations, printed advertisements, and informal communication with property

owners. These approaches can be time-consuming, geographically restrictive, and inefficient because prospective tenants frequently encounter incomplete information regarding rental prices, room availability, facilities, location, and payment arrangements. Research by Guttentag [3] demonstrates how digital accommodation platforms have transformed the accommodation market by enabling users to discover and evaluate available properties through online services. Similarly, Tussyadiah and Pesonen [4] highlight the influence of digital accommodation services on travel behavior and accommodation selection. Although these studies primarily examine short-term accommodation platforms, their findings provide relevant insights into the potential of web-based systems to improve information accessibility and accommodation-search efficiency.

The integration of geographic information and location-based services into web-based accommodation platforms provides additional opportunities to improve the accuracy and effectiveness of boarding house searches. Geolocation technologies enable users to identify property locations, visualize geographic distributions, and evaluate the proximity of available accommodation to educational institutions, workplaces, and public facilities. Schiller and Voisard [5] explain that location-based services integrate positioning technologies, geographic information, and communication infrastructure to deliver services associated with users' geographic contexts. Moreover, Zandbergen [6] demonstrates that geographic positioning accuracy varies according to the positioning technology and environmental conditions, highlighting the importance of reliable spatial information. In the context of boarding house information systems, integrating interactive maps, geographic coordinates, rental prices, and facility descriptions can support more informed accommodation decisions. Such integration is particularly relevant in Talang Padang District, where prospective tenants may require an efficient mechanism for identifying boarding houses that satisfy their location preferences, financial capabilities, and accommodation requirements.

Previous studies have demonstrated the potential of web-based information systems to support boarding house management and accommodation searches. Saksena et al. (2023) developed a campus-area-based student boarding house search information system using the Waterfall development methodology. The application provided information regarding boarding house availability, facilities, location maps, and property details, while enabling property owners to update accommodation information. Prasetya et al. (2021) developed a web-based boarding house application that supported room reservations, rental price management, tenant information, and payment transactions. Similarly, Nizar (2021) designed a web-based boarding house rental information system to facilitate accommodation promotion and property management. These studies illustrate the practical contribution of digital applications to boarding house services. However, the reported functionalities do not establish whether the systems comprehensively integrate geolocation-based searching, room availability management, reservation processing, and payment transaction recording within a unified platform. From an information systems perspective, Petter et al. [7] emphasize the importance of evaluating system success through interconnected dimensions, including information quality, system quality, user satisfaction, and organizational benefits. Therefore, further development is warranted to address the operational and information-management requirements of boarding house owners and prospective tenants.

Based on these challenges, this study aims to develop a web-based boarding house information and payment transaction system for Talang Padang District that integrates accommodation information management, boarding house searching, room reservations, tenant records, and rental payment administration. The proposed system is intended to provide prospective tenants with accessible information regarding boarding house locations, rental prices, available facilities, and room availability while supporting property owners in managing reservations, tenant data, and payment records through a centralized application. The development process adopts the Waterfall methodology to structure the stages of requirements analysis, system design, implementation, testing, and maintenance. The main contribution of this research lies in the development of an integrated boarding house service platform that combines accommodation discovery with administrative and financial transaction management in a specific local context. System functionality will be assessed through black-box testing to determine whether the implemented features operate according to the specified functional requirements. The proposed application is expected to improve

accommodation information accessibility, simplify boarding house management, and support more efficient interactions between prospective tenants and property owners.

2.0 THEORETICAL

2.1 Previous Research

Previous research, also known as a literature review, refers to a review or analysis carried out by a researcher of previously existing works of literature or research in a field that is relevant to the topic being researched. [2] Below is some previous research related to current research.

Table.1 Analysis of Previous Research Results

No	Author and Year	Research Title	Method	Results
1	Ilham Sidik Saksena, Ria Suci Nurhalizah, R Bagus Bambang Sumantri (2023)	Implementation of a Web-based Boarding House Search Information System for Students Based on Campus Area [1]	Waterfalls	The study findings include features that allow boarding house owners to update data as well as facility information, boarding house availability, location maps, and other related details. Using black box testing methodology, this website testing technique produces program test results that show that it is working as intended.
2	Muhammad Akbar Prasetya, Galih Mahalisa, M. Dedy Rosyadi, (2021)	Web-Based E-Kost Application and Boarding House Payment Transactions in South Banjarbaru District [3]	Use cases	creating a system that can help and simplify the management of all boarding house owner transactions, including managing reservations for rooms that have been booked, updating boarding house prices, inputting boarding room information, and inputting boarding house renter information.
3	Chalidazia Nizar, (2021)	Design and Development of a Website-Based Boarding House Rental Information System (E-Kost). [4]	Waterfalls	Makes it easy for boarding house managers to advertise boarding houses they want to rent and handle all boarding house problems quickly and easily, as well as for boarding house seekers who are looking for a place to live.
4	Muhammad Ibnu Saad, Muhammad Surahmanto	Geographic Information System Mapping Boarding Houses uses the Haversine formula method	Haversine formula method	Produce geographic information system data and use the Haversine formula algorithm which produces location mapping complete with overall information about costs

From a number of previous studies shown in table 1, there are differences in methods, web displays and results. In this research, we will use the *waterfall method* and present a simple web design so that it can be easily used by consumers.

Information Systems

An information system is an integrated arrangement of people, technologies, data, procedures, and organizational resources designed to collect, process, store, and distribute information for operational activities and decision-making. Laudon and Laudon define information systems through interconnected components that collect, process, store, and distribute information to support decision-making, coordination, control, analysis, and organizational activities [2]. Stair and Reynolds emphasize that information systems combine technological resources and operational procedures to transform data into meaningful information that supports organizational goals [3]. DeLone and McLean explain that information system success can be evaluated through six interconnected dimensions: system quality, information quality, service quality, system use or intention to use, user satisfaction, and

net benefits [4]. In addition, Petter, DeLone, and McLean demonstrated that information system success should be evaluated through multidimensional relationships rather than relying exclusively on technical performance [6]. Based on these theoretical foundations, an information system can be defined as an integrated technological and organizational framework that transforms raw data into useful information to support operational efficiency, decision-making, service delivery, and organizational performance. In the context of geolocation-based applications, information systems integrate geographic databases, location-detection technologies, digital mapping services, and user interfaces to provide accurate and accessible spatial information [2][5][6][7] [8][9].

Geolocation

Geolocation refers to the process of determining or estimating the geographic position of an object, device, or user within a defined spatial reference system. Geographic positions are commonly represented using latitude and longitude coordinates, although additional attributes such as altitude, accuracy, and timestamps may also be included. Kaplan and Hegarty explain that positioning technologies, particularly Global Navigation Satellite Systems (GNSS), provide geographic positioning capabilities through satellite-based measurements and navigation algorithms [7]. These technologies form an important foundation for modern location-aware applications. Schiller and Voisard describe location-based services as applications that integrate positioning technologies, geographic information, communication networks, and user-specific requirements to deliver services associated with geographic locations [8]. Zandbergen demonstrated that positioning accuracy can vary significantly depending on the technology and environmental conditions, particularly when comparing assisted GPS, Wi-Fi, and cellular positioning techniques [9].

3.0. METHODOLOGY

3.1 Method of collecting data

The author used data collection procedures to obtain the data necessary for his research, which is an important component of any research. Researchers can choose the best data collection technique based on the type of data required, availability of data sources that allow extracting information in the field, available conditions, time, and costs, as well as other factors for efficient research.

1. Observation
Using the observation method, researchers went directly to the research location, namely in a boarding house in Talangpadang District and observed and interacted directly so that the research could better understand the problems that would be used as research material.
2. Interview
Using this technique, researchers applied questions and answers to people at several research locations to be interviewed regarding the management carried out so far so that researchers could find shortcuts for this research.
3. Literature
Look for reference sources obtained indirectly, or based on data that is already available, such as books, insights and the internet that relate to the object being worked on.

Table 2. Cost Data Table

No	Boarding House Name	Kos Address	Total Cost
1.	H. Jaeni's boarding house	Jl. Minak Mangunang Agung Appeal	3 Doors
2.	H. Pandi's boarding house	Jl. Minak Mangunang Agung Appeal	4 Doors
3.	Can's boarding house	Jl. Supreme Appeal gg. SMK N 1 Talang Padang	18 Doors
4.	Ismet Boarding House 1	Jl. Sinar Harapan Makmur	20 Doors
5.	Ismet Boarding House 2	Jl. Rays of Hope Gg. Sampurna Take Care of Baya	8 Doors

6.	Jon's boarding house	Jl. Kalibening gg. SMA N 1 Talang Padang	5 Doors
7.	Darmidi boarding house	Jl. Lightning Ray Corps	4 Doors
8.	Ringgit boarding house	Jl. Baru Sinar Semendo	10 Doors
9.	Jondi boarding house	Jl. Upper Great Country	4 Doors
10.	Yur's boarding house	Jl. Upper Great Country	6 Doors
11.	Boarding House Fri	Jl. Sinar Harapan Makmur	8 Doors
12.	Gray Boarding House	Jl. King City	5 Doors
13.	Tris boarding house	Jl. Ansor Sinar Semendo	6 Doors
14.	Yun's boarding house	Jl. Sinar Semendo gg. Jasmine	8 Doors
15.	Ilaw boarding house	Jl. Blessings Jaya Minncang Atas	4 Doors
16.	Sukri's boarding house	Jl. Sakia Lightning Ray	3 Doors
17.	Hermi's boarding house	Jl. King City	2 Doors

3.2 System Development Methods

According to Albi, Johan (2020), this research uses the Waterfall method. It is a sequential software development process, which takes successive stages from top to bottom (*waterfall*) in the form of requirements (needs analysis), design (drafting and modeling), and implementation (application), continuously flowing. , Verification (testing) and maintenance (maintenance). [2]

1. Requirements

This step is an analysis of system requirements. Researchers will look for sources of information from users so that they will create applications that are expected by users so that they will create applications that are expected by users to help with all activities.

2. Design

The Design Stage is the initial design stage for creating the application. The design will display all the requirements that were designed before implementation. The design process will be explained with a *flowchart*.

3. Implementation

This part of the stage is the implementation stage. This stage is the most important stage in the *waterfall* method. In this application, the initial design, which is a design, will add source code to create a complete application system. The resulting program code is still in the form of modules which will later run like an application program.

4. Verification (Testing)

This stage is the testing stage. At this stage it can be concluded that the final stage in making the application. At this stage the user will test whether the system is running smoothly or not. In accordance with the initial design that was expected by users. This stage is indeed the final stage, but a program will be upgraded to improve the application system.

5. Maintenance

This stage is a stage that will continue to be carried out while the application program is still being used. This stage is not the final stage, but rather a stage that will continue to be carried out to improve the application system.

4.0. RESULTANTS

Systems Analysis

New system analysis involves a series of steps to understand and evaluate the needs, goals, and requirements of the system to be built. Here are some common stages in new system analysis:

1. Identify Needs

The initial stage in new system analysis is identifying business or organizational needs. This involves understanding the problems or challenges faced, as well as identifying opportunities to improve the efficiency, productivity or performance of existing systems.

2. Requirements Analysis

Once requirements are identified, this stage involves gathering and analyzing specific system requirements. This involves talking to relevant stakeholders, such as end users, management, and other relevant departments. System requirements may include functionality, performance, security, and user interface.

3. System planning

Once the requirements are gathered, the next stage is to design the new system. It involves creating a system architecture design that includes components, modules, and the interactions between them. Design also includes decision making regarding the technology to be used and integration with existing systems.

4. Evaluation and Solution Selection

After designing the system, this stage involves evaluating solution options that meet the established requirements and needs. Solutions can involve developing custom software, using existing software, or even using solutions with data hosted on *cloud* servers. The evaluation should include factors such as cost, resource requirements, scalability, and technical readiness.

5. Development and Implementation

Once a solution is selected, the next stage is the development of the new system and implementation in a production environment. Development involves programming, testing, and integrating system components. Implementation involves installing the system in appropriate infrastructure and training users.

6. Testing and Validation

This stage involves thorough testing of the system to ensure that it functions according to established requirements and expectations. Testing can include functionality testing, performance, security, and integration testing with existing systems.

7. Launch and Evaluation

After successful testing, the new system can be rolled out to the production environment. This stage involves monitoring and evaluating the system to ensure good performance and correct any problems that may arise during use.

Each stage in the analysis of a new system can involve iteration and active involvement of relevant stakeholders. It is important to involve stakeholders throughout the entire process to ensure successful implementation of the new system.

Login Page

On the login page the user can log in to enter the application using an email address, after entering the email address the user must wait for a verification reply and after receiving verification the user can access the application fully.

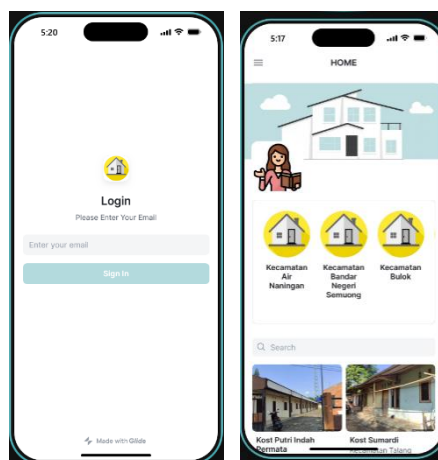


Figure 1. Login page

On the home page there is a simple list of boarding houses accompanied by pictures of the boarding house buildings. On this page there is also brief information about boarding house prices and facilities.

Boarding House Flat Yard

On the boarding house list page, users can see all the boarding house lists that have been entered into the application. The list also contains information on boarding house addresses and boarding house prices.

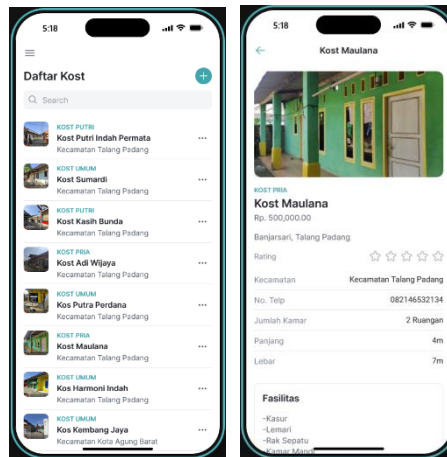


Figure 3. Boarding House List Page

On the boarding house details page there is complete information about the boarding house selected by the user to see detailed information provided by the boarding house owner such as number of rooms, facilities, prices and so on.

Payment Page

On the payment page, users can see information on the boarding price that the user must pay. There are also options for payment methods, namely via funds and bank transfer. Users can also upload a proof of payment file to ensure that they have paid with proof of payment in the form of an image.

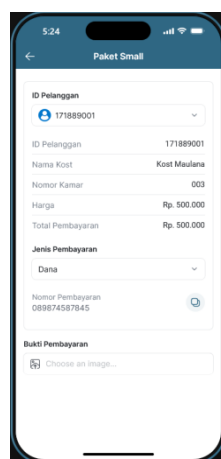


Figure 4. Payment Page

Analysis of Research Results

The development of a web-based boarding house information and payment transaction system in Talang Padang District is intended to address limitations in conventional accommodation searches and rental administration. The proposed system integrates boarding house information, room availability, geographic locations, reservation management, tenant records, and payment transactions into a centralized digital platform. This integration provides a foundation for improving information accessibility, administrative consistency, and interactions between prospective tenants and boarding house owners. The analysis focuses on the system's functional design, its potential contribution to accommodation management, and its relationship to previous research published in internationally recognized journals. From an

information systems perspective, the proposed application can be analyzed using the Information Systems Success Model introduced by DeLone and McLean [1]. The model emphasizes six interrelated dimensions: system quality, information quality, service quality, system use, user satisfaction, and net benefits. In the proposed boarding house system, system quality relates to navigation, functional reliability, and transaction processing, while information quality concerns the accuracy and completeness of boarding house descriptions, rental prices, facilities, and room availability. Integrating these functions within a single application may reduce information fragmentation and improve administrative efficiency. However, the actual effects on user satisfaction and operational performance must be established through empirical evaluation rather than inferred solely from the availability of system features.

Analysis of Boarding House Information Management

The proposed boarding house information management module enables property owners to maintain structured accommodation records, including boarding house descriptions, rental prices, available rooms, facilities, and location information. Centralizing these records can support more consistent information presentation and reduce dependence on conventional promotional methods, such as printed advertisements and personal recommendations. Prospective tenants can compare accommodation alternatives using information provided through the application, potentially reducing the effort required to identify suitable boarding houses. This interpretation is consistent with the research of Wang and Strong [2], who identified intrinsic, contextual, representational, and accessibility dimensions as important-components of data quality. Their framework suggests that information systems should not merely provide data but should ensure that the information is sufficiently accurate, relevant, understandable, and accessible to support users' needs. Accordingly, the effectiveness of the proposed boarding house information module depends on regular data updates, consistent property descriptions, and accurate room availability records. These requirements are particularly important because outdated rental prices or incorrect availability information may undermine users' confidence in the application.

Analysis of Geolocation-Based Boarding House Searching

The incorporation of geographic information into the boarding house search process provides a spatial dimension that distinguishes location-aware applications from conventional accommodation directories. By presenting boarding house locations through digital maps, the proposed system can assist prospective tenants in identifying properties within their preferred geographic areas. Geographic coordinates and location descriptions may also support comparisons of accommodation alternatives based on proximity to educational institutions, workplaces, and other relevant facilities. Research by Zandbergen [3] demonstrates that geographic positioning accuracy differs among assisted GPS, Wi-Fi, and cellular positioning methods. This finding indicates that reliable location-based services require attention to the quality of geographic coordinates and the limitations of positioning technologies. For the proposed system, the accuracy of registered boarding house coordinates is essential to ensuring that map markers correspond to actual property locations. Nevertheless, the presence of a digital map does not automatically establish improved search accuracy or reduced travel time. Such benefits require additional validation using coordinate verification, location-based search scenarios, or comparisons with conventional search procedures.

Analysis of Room Reservation and Payment Transaction Management

The integration of room reservation and payment transaction management represents an important functional contribution of the proposed application. Through the reservation module, prospective tenants can submit accommodation requests, while boarding house owners can manage booking records and monitor room availability. The payment management module is designed to organize rental transaction information, including payment amounts, transaction dates, and payment status. Combining these functions within a centralized platform can improve the traceability of administrative records and reduce inconsistencies associated with manually maintained transaction data. Chaw and Tang [4] investigated information requirements in online accommodation booking using survey data

from 94 respondents. Their findings demonstrated a significant positive relationship between the warranting value of accommodation information and users' trusting intentions. These results indicate that reliable and credible accommodation information plays an important role in digital booking environments.

Analysis of System Functionality and Black-Box Testing

Functional testing is necessary to determine whether the developed application satisfies its specified operational requirements. The proposed evaluation adopts black-box testing, which examines system behavior through input and output validation without requiring direct examination of the internal program structure. Testing should cover user authentication, boarding house data management, accommodation searching, reservation processing, tenant information management, and payment transaction recording. The functional evaluation can be organized into the following test scenarios.

Table 1. Proposed functional testing scenarios for the web-based boarding house information system

Tested module	Expected system behavior	Evaluation criterion
User authentication	Valid users can access authorized functions	Login and access validation
Boarding house management	Property information can be added, updated, and displayed	Data processing correctness
Accommodation search	Properties matching search criteria are displayed	Search functionality
Geolocation	Registered locations appear correctly on the map	Coordinate accuracy
Room reservation	Booking requests are recorded and reservation status is updated	Reservation consistency
Tenant management	Tenant information can be maintained and retrieved	Data integrity
Payment transactions	Payment information and transaction status are recorded	Transaction accuracy

Comparative Analysis with Previous Research

The proposed system extends the scope of conventional boarding house information applications by bringing accommodation searching, location information, reservations, and payment administration into a unified conceptual framework.

Table 2. Comparison of previous studies and the proposed research. The three Indonesian studies are summarized from the information supplied in the manuscript.

Previous research	Main research focus	Relevance to the proposed system
Saksena et al. (2023)	Campus-area boarding house search and accommodation information	Supports property discovery and information management
Prasetya et al. (2021)	Web-based boarding house reservations and payment transactions	Supports integration of booking and rental administration
Nizar (2021)	Web-based boarding house rental information	Supports digital promotion and property management
Chaw and Tang (2019) [4]	Accommodation information credibility and trusting intentions	Supports the importance of reliable booking information
Gavilan et al. (2018) [5]	Influence of online ratings and reviews on hotel selection	Supports transparent accommodation evaluation
Proposed study	Integrated boarding house information, geolocation, reservations, and payment records	Combines multiple services in the Talang Padang District context

The comparison indicates that the proposed study's contribution is primarily associated with functional integration and its application to a specific geographic context. This contribution should be distinguished from algorithmic novelty because the study does not currently demonstrate the development of a new search algorithm, positioning method, or transaction-processing technique.

5.0 CONCLUSION

The success of this application may depend on its acceptance and utilization by users in Talang Padang District. Efforts are needed to ensure that these applications are easy to use and provide significant added value to users. This application can increase efficiency in the boarding house payment transaction process by automating several stages in the process, such as payment processing and transaction recording. In developing web-based applications for payment transactions, it is important to ensure the security of users' personal data and financial transactions. Therefore, data protection and implementation of strong security practices must be of primary concern. Using Google Sheets as part of the system allows for data storage that is easy to access and manage. However, there may be limited ability to manage complex data or large volumes of data. Using Glide Apps as a platform for building web-based applications may have provided advantages in terms of fast and easy development, especially if the development team has limited skills in hands-on coding. The waterfall method helps organize development stages in a structured manner, starting from requirements analysis to final testing, thereby enabling the development team to manage the project more efficiently. The waterfall approach tends to be less flexible than more iterative development methods such as Agile. This can cause difficulties in responding to changing user needs or problems that arise during development.

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