

DEVELOPMENT OF A BOARDING HOUSE INFORMATION SYSTEM WITH 360° VIRTUAL TOUR

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ABSTRACT

An information system in the boarding house business is needed to manage the entire booking process from receipt, verification the availability, and payment process. Based on questionnaires and interviews, there is a problem with the conventional boarding house booking process, which needs to be more efficient. The boarding house owner tracks room availability in a notebook. When a boarder wants to rent, the manager checks the notebook, which is time-consuming and only provides general information without visual details of the rooms. Meanwhile, prospective boarders often seek information about the room's condition and choose to conduct surveys to assess the boarding house before renting. This study aims to simplify the process for prospective boarders, who often survey boarding houses to check room conditions, by creating an information system with detailed room info, a 360° virtual tour, online booking, and payment features. This research was conducted by following the stages of the Software Development Lifecycle (SDLC) using the waterfall model. Verification was performed through program trials by the boarding house owner and boarders, followed by interviews to obtain validation from relevant parties. The results indicate that the system functions effectively and streamlines administration, booking, and online maintenance reporting in boarding house.

Keyword: *information system, virtual tour, boardrent*

1. INTRODUCTION

One of the significant disruptive factors in today's world is information technology. Technology advancements over the last ten years have completely changed several businesses, including travel, music, hotels, and retail. Information systems are essential to an organization's ability to control the market or even to endure during periods of accelerating change [1]. The boarding house reservation industry is one that needs an information system. Reservations at boarding houses play a fair amount of a part in serving clients. [2]. However, this is a problem in the boarding house business.

Based on the results of interviews conducted with boarding house owners in Surabaya City, there is a problem with the conventional boarding house booking process, which needs to be more efficient. Owners of boarding houses keep a notebook room list, which the management uses to see if a room is available for rent by potential boarders. This requires a significant amount of time, and because the information is merely broad and does not include the boarding room's visual conditions, it needs to be more detailed. Conventional data processing allows for errors in recording, inaccurate reports, and delays in finding the required data. Adopting the right information system will help boarding house owners operationally in the long term [3].

In the reservation business, some factors determine success. Based on research conducted on guest houses, seven major critical success factors were identified: home atmosphere, room facilities, other facilities, service, cleanliness, location, and value for

money [4]. In addition, the research was conducted by providing questionnaires to the broader perspective. As a result, boarders thought that there should be more comprehensive information regarding boarding house facilities. Usually, only a picture of the front of the boarding house is available, making it difficult for boarders to know what amenities are offered. The cumbersome booking process discourages prospective renters from booking at the boarding house. The reservation system can be helpful for border prospects by allowing them to see the room type, price, and rental history.

A web-based boarding house information system can make it easier for users to search for boarding houses according to their booking needs [5]. A virtual tour is an activity of exploring a place virtually, which allows someone to see the condition of a place without having to be there [6], [7], [8]. Providing virtual tour services also supports promotional activities with unique and engaging visualizations. Virtual tours that can help border prospective conduct boarding room surveys are needed for border perspectives who want to save time.

There is a need for boarding house businesses to adopt a critical information system for the smooth running of boarding house businesses in answering the needs of prospective and boarders. On this basis, boarding house businesses require solutions by creating a website-based system equipped with an information system for ordering, reporting, or complaining about problems and virtual tours.

2. LITERATURE REVIEW

The development of this boarding house booking information system refers to several theoretical bases regarding booking information systems, 350 view virtual tours, and image stitching.

2.1. Reservation Information System

A reservation is generally an agreement to purchase something between two or more people. The deal is for something like a room, a room, a seat, or something else. A reservation information system is a system that manages the entire reservation process, such as receiving a customer order, verifying whether the goods or services are available, processing the payment, and delivering the goods or services [9].

The boarding house reservation information system can help in managing boarding houses at Kos Wisma Cirebon as a means of marketing boarding house services; the database is mutually integrated and can help in storing boarding house management data such as boarder data, room data, payment data, and so on, and can help managers in providing reports to the owner of the Wisma Cirebon boarding house. This information system lets boarding house owners monitor the rental transaction process [10].

2.2. Virtual Tour 360 View

A virtual tour represents a location comprising multiple images combined to produce a 360-degree panoramic photo. Virtual tours usually allow users to experience being there just by looking at the screen [7]. Panorama is a motion technique that changes the view to look more real than it is. This method makes the view as if the image is moving, giving the user the impression that they are at the original location [8].

2.3. Image Stitching

Image stitching techniques are usually referred to as direct or feature-based techniques. Direct techniques compare the pixel intensities of each image with each other. In contrast, feature-based techniques use different features extracted from the processed images to determine the relationships between the images [11]. To create a panorama, each photo must have overlapped or mixed parts. The pictures taken are then combined in the image stitching process so that the image becomes one part of the panoramic scene. [12].

3. RESEARCH METHODOLOGY

This study needs exploration through observation, questionnaire distribution, and literature study. System development was carried out by implementing the Software Development Lifecycle (SDLC) stages using the waterfall model. This development method consists of five consecutive phases, and they are respectively: Business analysis, design, implementation, testing, and maintenance [13].

The business analysis stage involves gathering data through interviews with boarding house owners

and distributing questionnaires to customers. The design stage translates the needs analysis into process designs using BPMN and data models using ER diagrams. During the implementation phase, business requirements and design specifications are converted into functional and executable outputs, such as programs, databases, websites, or software components, through coding and deployment. At this stage, the actual code is written and compiled into a working application, while databases or text files are created. The testing phase, also known as verification and validation, ensures that the software solution meets the original requirements and specifications, effectively serving its intended purpose. Lastly, the maintenance phase involves post-deployment updates to improve functionality, correct errors, and enhance performance and quality.

4. RESULT AND DISCUSSION

The research results are the implementation of each stage, namely process design, data design, implementation, and testing. This system has three access rights: superadmin, owner, and boarder.

4.1. Process Design

The process design in this study uses Business Process Modeling and Notation (BPMN). This study's main processes are the ordering and reporting processes. The ordering process can be seen in Figure 1.

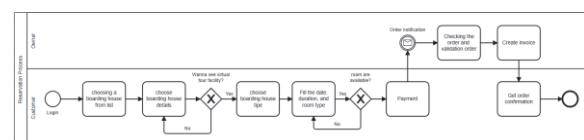


Figure 1. Reservation Process

After making a boarding house reservation, customers can do further activities as boarders, such as reporting if there are problems related to the boarding house. The reporting process can be seen in Figure 2.

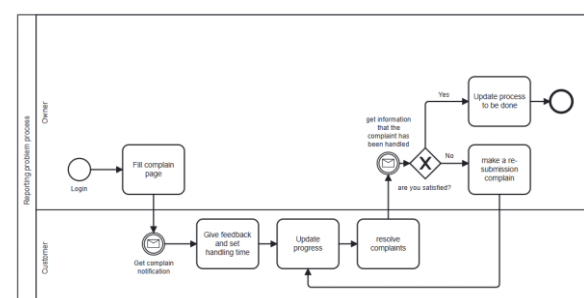


Figure 2. Complain Process

4.2. Data Design

The database design contains an Entity Relationship Database (ERD), which explains the entities and attributes in the database. The database design in this study was analyzed into 17 entities. This design functions to store login data, register, boarding

house data, ordering process, payment process, reporting process, and broadcast. Details of the ERD design can be seen in Figure 3.

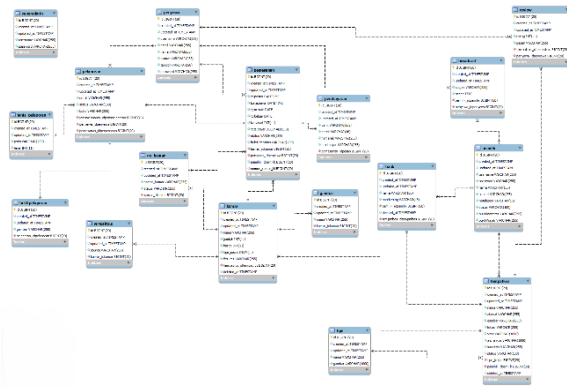


Figure 3. Entity Relationship Database (ERD) Design

4.3. Implementasi Sistem

This system is built using HTML, PHP, Javascript, and CSS. The framework used is Laravel 10 and Bootstrap. The following are the results of implementing several prominent features in the system.

4.4. Search Bar Features

This feature can be available on the boarder's index page. The search feature can be accessed when logged in or not logged in. There is a search bar for locations based on city names in Indonesia. In addition, sorting and filtering can also be done. The search feature display can be seen in Figure 4.

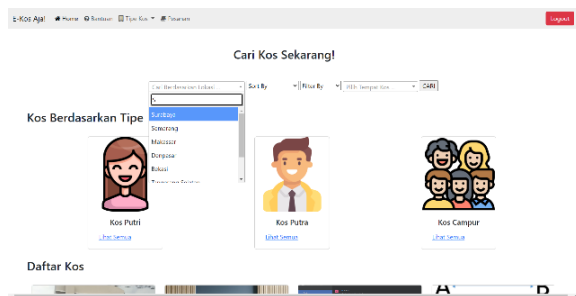


Figure 4. Search bar view

4.5. Virtual Tour Features

Boarders can access virtual tours on the room detail page. On this page, there will be a 360-view button to view the virtual tour of the room. The size of the virtual tour can be enlarged or reduced, and the display can also be made full screen. The virtual tour display can be seen in Figure 5.



Figure 5. Virtual Tour Feature View

4.6. Payment Features

Payment is made when you have successfully booked a boarding room on the desired date. There is an upload button on the order list page. When the upload button is pressed, the payment upload page will open. The boarder must fill in the bank name, account number, account owner name, and proof of payment. After that, you can click upload so the boarding house owner can verify the payment. The appearance of the payment upload page can be seen in Figure 6.

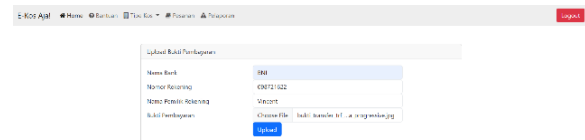


Figure 6. Payment Feature View

4.7. Complaint Features

The complaint feature can be accessed by boarders who have booked a boarding house. The complaint button will appear on the navbar if the boarder has made the order. Add reporting can be accessed from the reporting list page. On the add reporting page, boarders can select which room they want to report. After that, they can choose the appropriate type of reporting and the report's details. Boarders can also include image evidence. The display of the add reporting page can be seen in Figure 7.

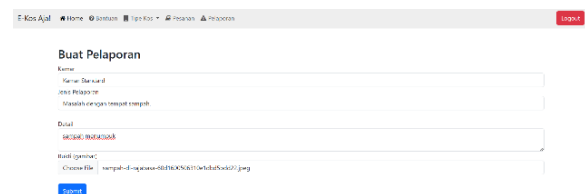


Figure 7. Complain Page Feature

4.8. Broadcast Features

The broadcast feature can only be used when logged in as the Owner. The Owner can access the broadcast by clicking the button on the system sidebar. On the send message to the boarder page, the Owner can send a message to all or each email from the boarder. The Owner can fill in the subject and content of the message. The Owner will send broadcast messages via email using the SMTP configured in the system. The display of sending a message to boarders can be seen in Figure 8.

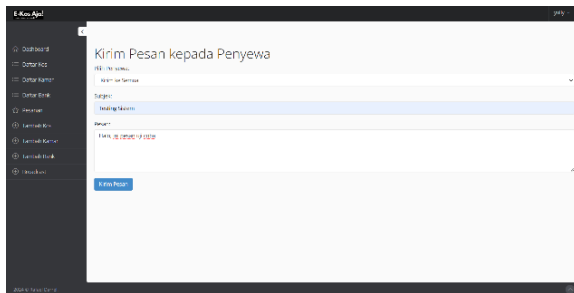


Figure 8. Broadcast message features to all boarders

4.9. Rating & Review Features

Rating and review can be done by boarders who have completed their boarding room reservations. The boarder can create a review page on the order list by pressing the review button. Boarders can provide a rating by filling in the available stars. In addition, they can also fill in a message as a review of the boarding house, as seen in Figure 9.

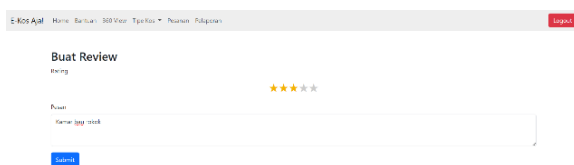


Figure 9. Rating and Review Page

4.10. System Testing

Verification is done with three scenarios, namely, as a boarder, as an owner, and as a super admin. The owner does testing from the account registration process, login, adding boarding houses, changing boarding houses, deleting boarding houses, adding rooms, changing rooms, deleting rooms, adding room images, adding virtual tours, changing virtual tours, deleting virtual tours, processing orders, and processing reports. The boarder does testing from the account registration process, login, view all boarding house lists, trying the search feature, making reservations, making payments, providing reviews and ratings, viewing virtual tours, and reporting problems until the boarding house owner gets feedback. The super admin does testing through the border

verification process and the boarding house verification process.

The researcher validated the administrative information system for the boarding houses by interviewing the owners of the Executive Ploso and Mustika boarding houses, who serve as the system's primary users. They also gathered feedback by interviewing representatives of the boarding house residents. The researcher conducted these interviews after demonstrating the system to the owners and the residents. The validation process produced the following results:

- The website has an easy-to-use display,
- The website is very informative because my boarding house owner can access orders and reports in real-time.
- Through this website, prospective residents can obtain various complete information starting from room availability prices to room photos
- The website can assist in the management of the boarding house owner's business.

5. CONCLUSION

Based on the verification and validation results, the researcher found that the system created can help boarding house owners manage the boarding house administration process. This system also allows prospective tenants to see a boarding house that suits their wishes. This system helps boarding house tenants in reporting problems that occur. Ease of use is obtained through the selection of colors, arrangement, and the availability of clear information on the website, including the latest recording of boarding house room availability. The ordering process through the system becomes easier because information, prices, and payment processes are on one website. The system developed provides rating and review features that can be used to evaluate boarding house owners. Future system development can add an E-wallet as a payment method in booking boarding rooms, considering that an E-wallet makes payments more practical. In addition, the system can also be added with a login feature using social media or a Google account, a promo feature, and a multi-language feature that makes it easier for users. The provision of financial reports features that are integrated with boarding house business income also needs to be developed to help boarding house owners do business financial bookkeeping.

BIBLIOGRAPHY

- [1] E. Supriyadi, *Sistem Informasi Bisnis Dunia Versi 4.0*. Yogyakarta: Penerbit Andi, 2020.
- [2] N. Noviasuti and D. Agustina Cahyadi, "Peran Reservasi Dalam Meningkatkan Pelayanan Terhadap Tamu di Hotel Novotel Lampung," *Jurnal Nusantara*, vol. 3, no. 1, pp. 31–37, Feb. 2020, [Online]. Available: <https://jurnal.akparda.ac.id/index.php/nusantara/article/view/17>

- [3] N. Purwati and H. Noor, "Perancangan Sistem Informasi Administrasi Tamu Hotel (Studi Kasus Pada Hotel Ganesha Purworejo)," *Journal Speed-Sentra Penelitian Engineering dan Edukasi*, vol. 8, no. 1, pp. 36–43, 2016, doi: <http://dx.doi.org/10.3112/speed.v8i1.1395>.
- [4] S. Wang and K. Hung, "Customer perceptions of critical success factors for guest houses," *Int J Hosp Manag*, vol. 48, pp. 92–101, 2015, doi: <https://doi.org/10.1016/j.ijhm.2015.05.002>.
- [5] G. T. F. Zeck, "Rancang Bangun Sistem Informasi Kos-Kosan Menggunakan Framework Rapid Application Development," *Jurnal Onlie Mahasiswa Sistem Informasi dan Akuntansi (ONESISMIK)*, vol. 3, no. 3, pp. 226–233, 2019, [Online]. Available: <https://jurnal.dcc.ac.id/index.php/onesismik/article/view/307>
- [6] I. Gede, B. Subawa, I. Nengah, E. Mertayasa, and D. S. Wahyuni, "Pengembangan Virtual Tour Program Studi Pendidikan Teknik Informatika Berbasis Fotografi 360 Derajat," *Kumpulan Artikel Mahasiswa Pendidikan Teknik Informatika (KARMAPATI)*, vol. 11, no. 3, 2022, doi: <https://doi.org/10.23887/karmapati.v11i3.54899>.
- [7] F. R. Daud, V. Tulenan, and X. B. N. Najoran, "Virtual Tour Panorama 360 Derajat Kampus Universitas Sam Ratulangi Manado," *E-journal Teknik Informatika*, vol. 8, no. 1, 2016, doi: <https://doi.org/10.35793/jti.v8i1.13173>.
- [8] T. Widiyaningtyas, D. D. Prasetya, and A. P. Wibawa, "Web-based campus virtual tour application using ORB image stitching," in *International Conference on Electrical Engineering, Computer Science and Informatics (EECSI)*, Institute of Advanced Engineering and Science, Oct. 2018, pp. 46–49. doi: 10.1109/EECSI.2018.8752709.
- [9] J. A. O'Brien and G. M. Marakas, *Management Information Systems*. New York: McGraw-Hill/Irwin, 2008.
- [10] N. Abdussamad and L. Paris Hasugian, "Prototipe Sistem Informasi Reservasi Kos (Studi Kasus: Kos Wisma Cirebon Bandung)," *Jurnal Manajemen Informatika (JAMIKA)*, vol. 9, no. 1, pp. 39–48, 2019, Accessed: Dec. 17, 2024. [Online]. Available: <https://ojs.unikom.ac.id/index.php/jamika>
- [11] E. Adel, M. Elmogy, and H. Elbakry, "Image Stitching based on Feature Extraction Techniques: A Survey," *Int J Comput Appl*, vol. 99, no. 6, pp. 1–8, Aug. 2014, doi: 10.5120/17374-7818.
- [12] G. Yuda Pramana and I. Arfiani, "Penerapan Metode Image Stitching Pada Pembuatan Virtual Reality Pengenalan Islamic Center Universitas Ahmad Dahlan," *Jurnal Informatika dan Komputer (JIKO)*, vol. 3, no. 2, 2019.
- [13] Y. Bassil, "A Simulation Model for the Waterfall Software Development Life Cycle," *Int J Eng Technol*, vol. 2, no. 5, pp. 2049–3444, 2012, [Online]. Available: http://iet-journals.org/archive/2012/may_vol_2_no_5/255895133318216.pdf