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RESEARCH ARTICLE

The Development of A Hotel Room Reservation Application Using The Laravel Framework at Abadi Hotel

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Abstract: The rapid development of information technology has prompted various industries, including the hospitality sector, to adapt to digital services. Hotel Abadi, as a provider of accommodation services, requires a web-based room booking system to enhance operational efficiency and customer convenience. This study aims to develop a hotel room reservation application using the Laravel framework, a modern PHP framework known for its security features, MVC structure, and database management capabilities. The system development method used is the Waterfall model, consisting of requirement analysis, system design, implementation, testing, and maintenance phases. Data were collected through direct observation, interviews with hotel management, and documentation of the conventional booking process. The main features developed in the application include: room search, room reservation, payment confirmation, customer data management, and transaction reporting. The testing results show that the application operates according to the expected functionalities. Users can independently book rooms without having to visit the hotel in person. The system also facilitates real-time management of booking and payment data for the hotel administration. With this application, Hotel Abadi is expected to improve service quality and competitiveness in the digital era. This Laravel-based room reservation application contributes significantly to the digital transformation in the hospitality sector, especially for medium-scale hotels that still rely on manual processes.

Keywords: Room Booking, Laravel, Hotel, Web Application, Digital Transformation

1. Introduction

The development of information and communication technology has shown rapid progress in recent years and has significantly influenced various aspects of human life. The digital era has transformed how people work, interact, and access information and services. Technological innovations such as the internet, cloud computing, and web-based software development have opened new opportunities to create more efficient and effective solutions across different sectors



(Laudon & Laudon, 2021). Information technology is no longer a mere complement but has become a core component in business operations, education, healthcare, and even everyday social life (O'Brien & Marakas, 2020). This advancement demands every sector to dynamically adapt to avoid being left behind in the global competition (Turban et al., 2018).

In the hospitality industry, technology plays a crucial role in supporting operational activities and customer services. Many hotels today have implemented technology-based systems such as Online Reservation Systems, Property Management Systems, and even the use of Artificial Intelligence for customer service through chatbots and automated room service (Gretzel et al., 2020). As a part of the tourism industry, hotels must provide fast, accurate, and convenient services to meet the growing expectations of customers (Buhalis & Leung, 2018). The utilization of digital technology is also a key factor in building competitive advantage, especially in the midst of intense competition and the need for operational efficiency (Ip, Leung, & Law, 2019).

The importance of technology implementation in the hotel sector cannot be overlooked. Technology can enhance operational efficiency, simplify administrative processes, and improve the overall customer experience. Manual or conventional room reservation systems are prone to various issues, such as guest data recording errors, double bookings, and slow response times to customer requests (Sigala, 2020). Therefore, the use of information technology is a strategic step to minimize such problems and improve hotel management performance (Kasavana & Brooks, 2019). In addition, IT enables integration among hotel departments such as reservations, finance, and housekeeping, resulting in a more structured and efficient workflow (Law, Buhalis, & Cobanoglu, 2014).

The benefits of using technology in hotel management are not only felt by the management but also by the customers. With an online room booking system, customers can make reservations anytime and anywhere without having to visit the hotel physically. Technology also provides price transparency, room choices, and guest reviews that help customers make informed decisions (Xiang, Du, Ma, & Fan, 2017). For hotels, the system helps in managing guest data, monitoring occupancy rates in real-time, and generating reports to support strategic decision-making (Morosan & DeFranco, 2016). Thus, technology becomes a crucial element in improving service quality and overall customer satisfaction (Bilgihan, 2016).

The object of this research is Hotel Abadi, which is strategically located and serves as one of the preferred hotels for both tourists and business travelers. The hotel has several flagship facilities and has been operating for several years serving its customers. However, the current room booking system is still performed manually, either through phone calls or by direct recording at the front desk.

The main issue faced by Hotel Abadi is the absence of a web-based room reservation system that can be accessed independently by customers. This situation leads to several problems, such as reservation data entry errors, relatively slow service time, and limited information available to customers prior to booking. Such conditions can decrease customer satisfaction and hinder management in analyzing reservation data effectively.

This situation has become more complex due to the growing demand for digital services, especially after the COVID-19 pandemic, which has forced many sectors, including hospitality, to adapt to digital systems. Customers now prefer contactless services and online reservations as a form of efficiency and safety (Gretzel et al., 2021). Without immediate action, Hotel Abadi risks being left behind by competitors who have already fully implemented digital systems.

Based on the above description, the researcher chose the title: "Development of a Hotel Room Booking Application Using the Laravel Framework at Hotel Abadi." This title was selected due

to the urgent need for a web-based room reservation information system to enhance efficiency, accuracy, and service quality at Hotel Abadi. Laravel is chosen for its flexibility in developing responsive, secure, and easily maintainable web applications that can be scaled in the future.

2. Literature Review

2.1. Definition of Hotels

A hotel is a commercial establishment that provides lodging, meals, and various other services for travelers and tourists. According to Medlik and Ingram (2000), a hotel is defined as “an establishment offering accommodation, meals, and refreshments for travelers and temporary guests in return for payment.” Hotels vary in size, function, and cost, and they are categorized into star ratings based on service quality and amenities provided. In the digital era, hotels are increasingly expected to provide seamless customer service, online reservation facilities, and digital engagement strategies to stay competitive in the hospitality industry (Walker, 2020).

2.2. Definition of Room Booking

Room booking refers to the process of reserving a room in advance at a hotel or other accommodation facility. It involves collecting guest details, selecting room types, determining the stay period, and confirming availability. With the advancement of technology, room booking systems have evolved from manual methods (e.g., phone calls and walk-ins) to automated, online reservation systems that allow customers to view availability, select preferences, and confirm bookings via digital platforms (Law, Leung, & Wong, 2015). Effective booking systems contribute to improved customer satisfaction, error reduction, and enhanced operational efficiency (Sigala, 2020).

2.3. Definition of Framework Laravel

Laravel is an open-source PHP web application framework known for its elegant syntax, scalability, and developer-friendly features. It follows the Model-View-Controller (MVC) architectural pattern and offers built-in tools for routing, security, authentication, database migration, and more (Otwell, 2020). Laravel is widely used in the development of robust, secure, and maintainable web applications. According to Rahman and Anwar (2019), Laravel simplifies the development process and accelerates project delivery through reusable components and a strong developer ecosystem. Its support for RESTful APIs and Blade templating engine makes it suitable for both small-scale and enterprise-level web systems.

2.4. Literature Study

Several previous studies have explored the implementation of technology in the hospitality sector, particularly in the development of hotel management and booking systems. Sari and Wijaya (2020) developed a web-based hotel reservation system using PHP and MySQL to streamline the booking process and reduce administrative burdens. Their research highlighted the importance of real-time availability and data integration.

Wulandari et al. (2021) created a Laravel-based room reservation application that enhanced user experience through responsive design and secure transactions. The study concluded that Laravel's MVC structure helps in organizing the application logic effectively, improving system maintainability.

Moreover, research by Prasetyo and Ramadhani (2022) showed that the implementation of a hotel management information system significantly improved the speed and accuracy of guest

service operations. The system provided integrated access to reservation, payment, and housekeeping data, enabling better decision-making for hotel managers.

These studies demonstrate the growing trend of digital transformation in the hospitality industry and validate the use of modern web frameworks like Laravel to support this evolution.

3. Research Method and Materials

3.1. Type of Research

This study uses the Research and Development (R&D) method, which is a research approach aimed at developing and producing a product or system, as well as testing the effectiveness of the developed product. This method was chosen because it aligns with the objective of the research, which is to develop a web-based hotel room booking application using the Laravel framework.

3.2. System Development Method

The system development model used in this research is the Waterfall Model. This model was selected because it offers a structured and systematic software development process. The stages in this model are as follows:

(1). Requirement Analysis

In this stage, data is collected and system requirements are identified through observation, interviews, and literature review.

Based on the observations and interviews conducted at Hotel Abadi, several key problems in the current system can be identified as follows:

- (1). The booking process is not yet computerized, making it prone to errors in recording customer data and room availability.
- (2). Room information is not available in real-time, leading to the potential risk of overbooking.
- (3). Payment verification is conducted manually, resulting in delays in the validation process and increased workload for the staff.
- (4). There is no transaction history or automated reporting, which makes it difficult for management to make data-driven decisions.
- (5). There is a lack of information transparency for customers, as there is no online platform accessible directly by the guests.

(2). System Design

This stage involves designing the system structure, including the user interface, database schema, and overall system architecture.

(1). Use Case Diagram

A Use Case is an analysis and design method used in software development to document the interactions between a system and its users. The Use Case illustrates how the system is used and how it responds to user activities.

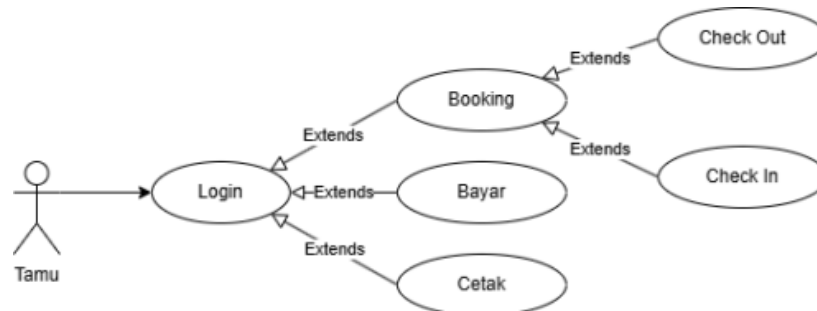


Figure 1. Use Case Customer

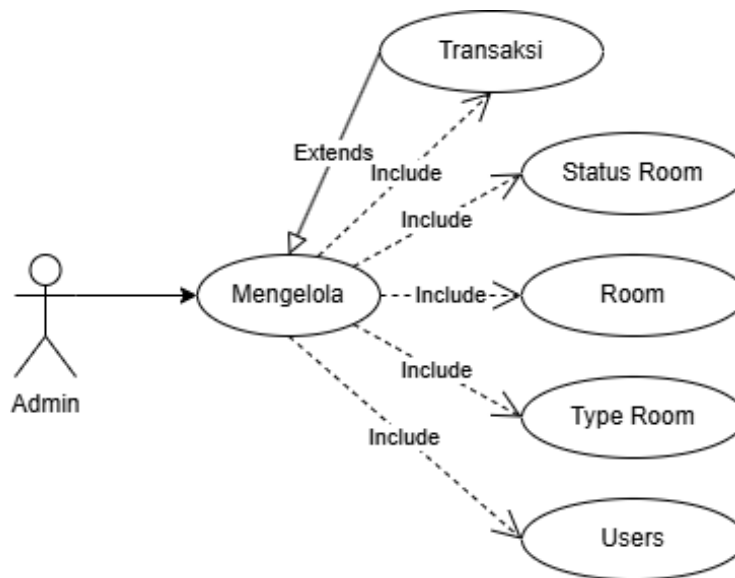


Figure 2. Use Case Admin

The illustration above is a Use Case Diagram that depicts the interaction between the actor "Guest" and the hotel booking application system. In this scenario, the Guest must first perform a Login process before gaining access to other features. After a successful login, the Guest can proceed with Room Booking, which can then be extended to Check-In and Check-Out processes as part of the stay flow. Additionally, the Guest can perform Payment and Print, which are supplementary features that also extend from the login function. The extends relationship indicates that these features are optional and depend on certain conditions of the main activity initiated by the login. This diagram helps illustrate the core functional flow in the hotel booking system from the perspective of a guest user.

(2). Activity Diagram

An Activity Diagram visually represents a series of control flows within a system, similar to a flowchart or data flow diagram. Activity diagrams are often used in business process modeling. They can also be used to describe the detailed steps involved in a Use Case Diagram.

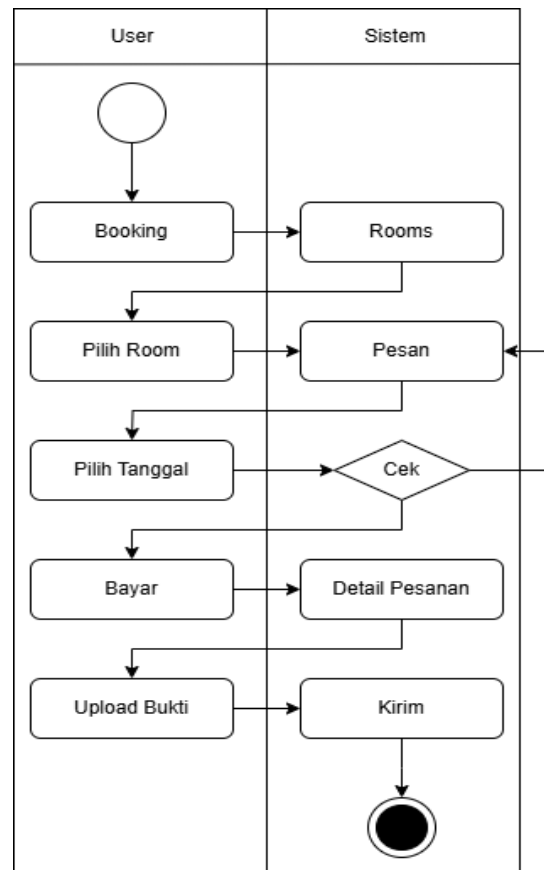


Figure 3. Activity Diagram Booking

The diagram above illustrates the booking process in the web-based reservation application at Abadi Hotel. The process begins when the user selects the "Booking" option, which directs them to the Dashboard page. From the dashboard, the user can choose the menu or room to be booked via the "Booking" feature. After selecting the desired item, the user is taken to the Payment page where they can view the total amount to be paid.

The next step involves filling out the Order Data Form to input booking details and payment information. Once all the required information has been entered, the user completes the process by clicking the "Pay" button.

This process ensures that room booking and payment are conducted systematically and efficiently through the web-based application.

(3). *Sequence Diagram*

A Sequence Diagram is used to illustrate the functional flow within a Use Case. The sequence diagram in this use case represents the following process:

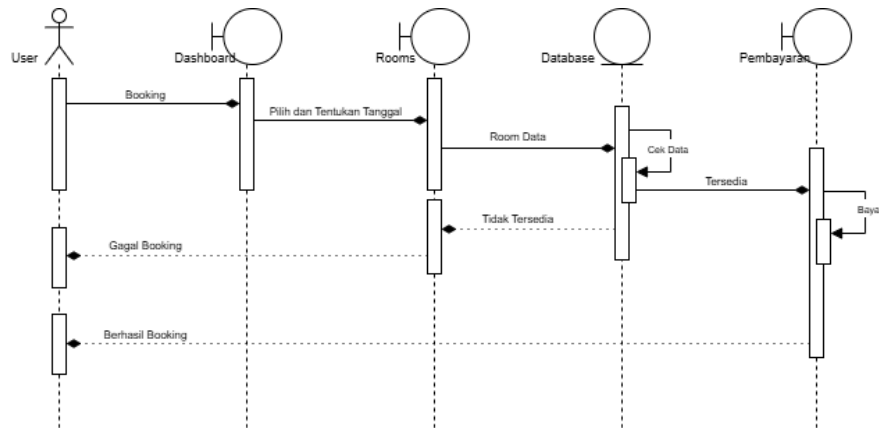


Figure 4. Sequence Diagram Booking

The sequence diagram above illustrates the booking and payment process in the web-based reservation application at Abadi Hotel. The process begins with the user selecting a menu item on the home page. After selecting an item, the user adds it to the cart and proceeds to place an order.

The order data is then sent to the controller for validation. The controller checks the validity of the order data. If the data is valid, the controller sends a "Valid" response back to the cart, and the order is considered successful. If the data is invalid, the controller sends a "Not Valid" response, and the order fails to be processed.

This diagram demonstrates the flow of interaction between the user, home page, cart, and controller during the booking and order validation process in the application.

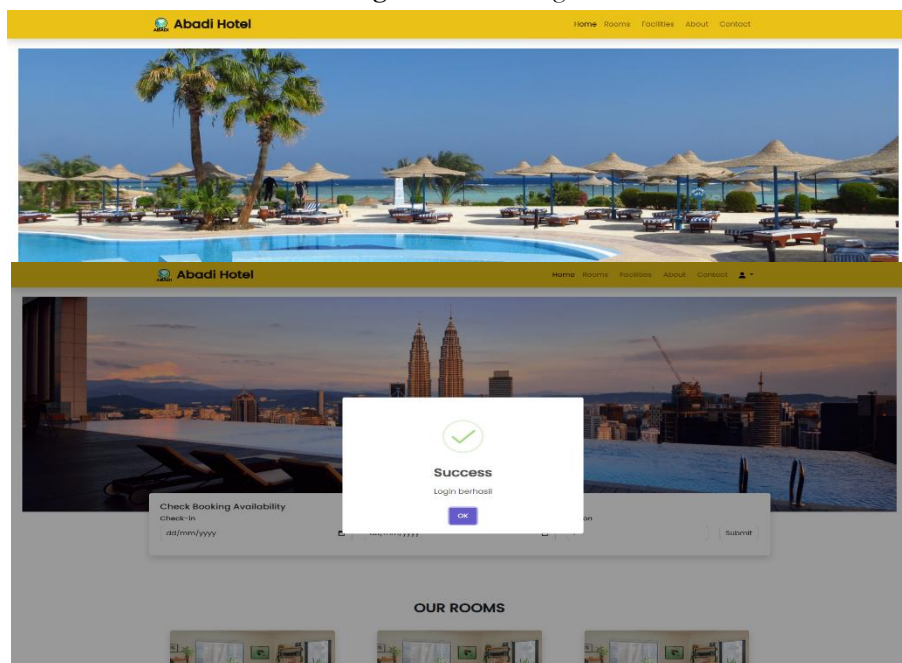
(a). Implementation

This stage is the coding process based on the previously designed system, using the Laravel framework.

(1). Application Usage Procedure

Below is the operating procedure for the Booking application at Abadi Hotel, accessible at <https://abadihotel.filkom.id/>:

Figure 5. Home Page



The figure shows the home page of Abadi Hotel, featuring a clean, professional layout with a hero image of a swimming pool facing a sandy beach with thatched umbrellas. At the top, a yellow header displays the hotel's logo and name on the left and a navigation menu on the right—Home, Rooms, Facilities, About, Contact. Beneath the hero image is a “Check Booking Availability” form where guests enter check-in date, check-out date, and number of guests. Farther down, the heading “Our Rooms” introduces the room options available.

Figure 6. Customer Dashboard

After a successful login, the user is redirected to the dashboard, which offers the Home, Rooms, Facilities, About, Contact, and Profile menus.

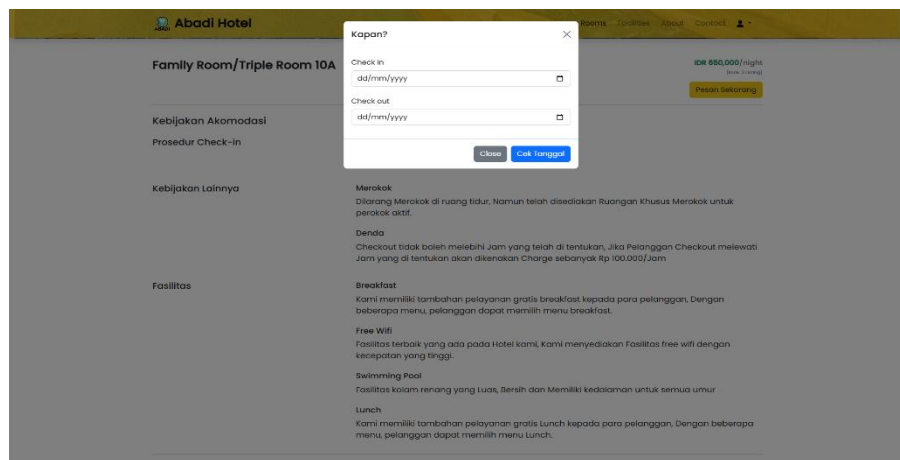


Figure 7. Booking Page

On this page the guest must enter check-in and check-out dates to proceed.

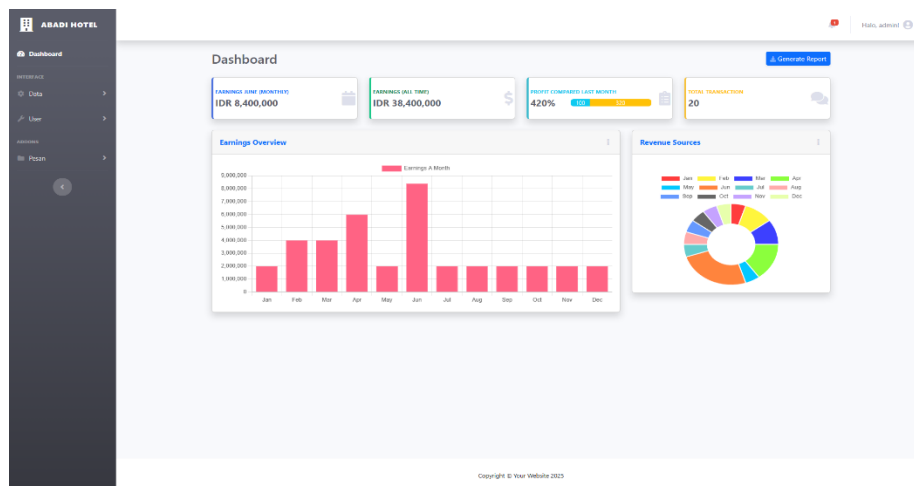


Figure 8. Admin Dashboard

The admin dashboard contains key buttons: Dashboard (home), Users (manage customers), Orders (manage bookings), and Products / Categories (manage room products). The following figure focuses on order processing.

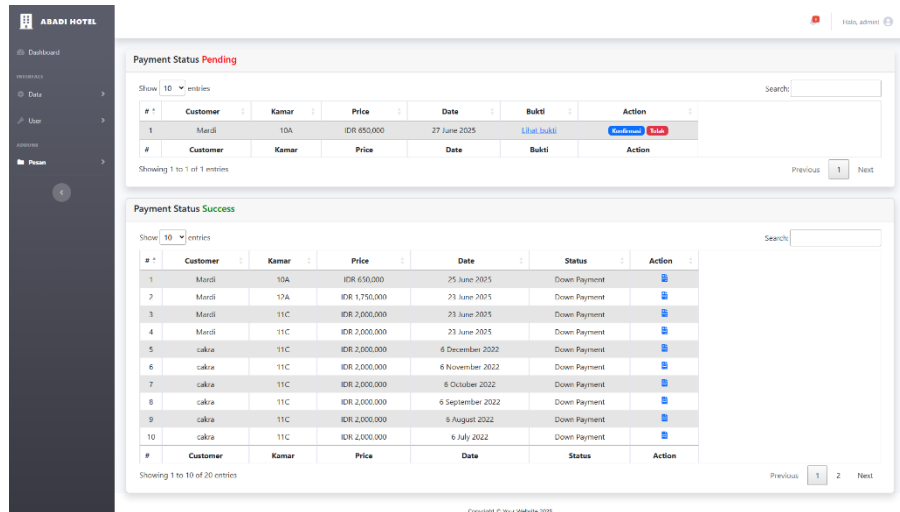


Figure 9. User Orders Page

This table shows all customer bookings along with their status. To process an order, the admin verifies whether payment has been made by checking the uploaded proof of transaction and then clicking Confirm.

(2). Testing

System testing is carried out to ensure that all application functions run as intended.

(a). Black Box Testing

Table 1. Home Page

Input	Expected Output	Observation	Conclusion
Open Abadi Hotel Home Page	Displays login menu, register, product data, product details, Home	As expected	Success

Table 2. Register Page

Input	Expected Output	Observation	Conclusion
Click register menu	Register menu appears	Register menu displayed	Success
Full name, username, password, confirm password	All inputs available in text boxes	As expected	Success
Click register	Data is saved in user database	Data successfully stored in database	Success
Click login	Redirects to login page	Login page displayed	Success
Submit with empty fields	Shows error message, data not saved in database	As expected	Success

Table 3. Login Page

Input	Expected Output	Observation	Conclusion
Click login menu	Displays login form	Login form displayed	Success
Username and password	Inputs available in text boxes	As expected	Success
Login with correct data	Redirects to dashboard page	Dashboard opened	Success
Login with incorrect data	Shows error message and stays on login page	As expected	Success

Table 4. User Page

Input	Expected Output	Observation	Conclusion
Dashboard	Displays login, register, product data, product details, Home, Testimonial, Contact, Profile, and Transaction History	As expected	Success
Click product	Displays product details	Product data shown	Success
Click Buy	Adds item to cart and allows order adjustments	As expected	Success
Click Payment	Displays personal data and full address input form	As expected	Success
Click Pay Now	Displays payment method pop-up	Payment method pop-up displayed	Success
Already Paid	Shows successful payment message	Message displayed	Success
Not Yet Paid	Does not show success message	As expected	Success
Progress Bar	Displays booking progress visually	As expected	Success
Click Profile	Displays user data	User data shown	Success
Click Logout	Returns to login page	As expected	Success

Table 5. Admin Page

Input	Expected Output	Observation	Conclusion
Click login menu	Displays login form, login with admin credentials	Login menu appears and works as expected	Success
Admin dashboard	Displays menus: Users, Orders, Products, Categories, Profile, Promo, Logout	As expected	Success
Users menu	Able to view and manage users	As expected	Success
Orders menu	Able to view and manage orders until completion	As expected	Success
Categories menu	Able to manage categories	As expected	Success
Products menu	Able to manage products	As expected	Success
Promo menu	Able to manage promotions	As expected	Success
Click Logout	Returns to login page	As expected	Success

(3). Maintenance

This is the stage of maintaining and improving the application after implementation, based on user feedback and testing results.

3.3. Research Location and Time

The research was conducted at Hotel Abadi, which is located in a strategic area and frequently visited by both tourists and business travelers. The research was carried out from February to July 2025.

4. Results and Discussion

4.1. Overview of Application Interface

The hotel room booking application developed for Abadi Hotel presents a clean, structured, and interactive user interface that supports both customers and administrators. The home page features a dynamic display with a real-time room availability check form, enabling users to quickly input their check-in and check-out dates along with the number of guests. The system guides users through a seamless flow, beginning with account registration, login, and room browsing. Each room listing includes options to view detailed information or directly proceed with a

booking. The interface also provides access to user profiles and booking history, offering a complete self-service experience. On the administrative side, the dashboard offers control over user management, room data, categories, booking confirmations, and promotional content. The interface is designed with clarity and responsiveness in mind, allowing access across multiple devices and platforms.

4.2. Application Usage Procedure

The usage of the application begins when a user accesses the official Abadi Hotel booking website through the provided URL. From the home page, users can check room availability and proceed to registration if they do not already have an account. The registration form collects essential information such as name, username, and password, which, upon validation, allows access to the customer dashboard. After successful login, users can explore available rooms, view details, and initiate the booking process by selecting their desired check-in and check-out dates. Once a booking is made, the system guides the user to the payment interface, where various methods are offered. Users are required to upload proof of payment, after which they can monitor their booking status from the order history menu. For administrators, the login panel leads to a backend dashboard where user accounts, room data, and transaction records can be managed efficiently. This structured process ensures a smooth flow from booking to confirmation and fosters transparency and ease of use for all stakeholders involved.

4.3. Black Box Testing Results

To ensure the functionality and reliability of the application, a series of tests were conducted using the Black Box Testing method. Each feature within the application was tested from the user's perspective, focusing on input and output without examining internal code logic. The results show that all main features functioned as expected. The home page correctly displayed essential menus and booking forms. The registration page successfully handled data input, validation, and redirection to the login page, while also providing appropriate error messages for incomplete data. Login functionality performed reliably, allowing access with valid credentials and preventing access with incorrect ones. For regular users, actions such as browsing rooms, adding bookings, completing payment processes, and tracking progress were executed smoothly, with the system providing appropriate feedback at each stage. The administrative functions, including user management, order confirmation, and content updates, were also tested and returned positive results. Overall, the testing phase confirms that the system is operational, user-friendly, and in line with its intended purpose.

5. Conclusion

The development of a web-based hotel room booking application using the Laravel framework at Abadi Hotel has successfully addressed the key operational challenges previously encountered in the manual booking process. Through the implementation of this system, several improvements have been achieved, including enhanced booking accuracy, real-time room availability, structured payment validation, and increased transparency for both customers and administrators.

The application offers an intuitive interface that simplifies user interaction, allowing guests to register, book rooms, make payments, and track their booking status independently. At the same time, the admin dashboard enables efficient management of users, bookings, and hotel room data. The integration of automated features, such as transaction history and data validation, further contributes to improved service quality and decision-making.

Functional testing using the Black Box method confirms that the system operates as expected, with each module responding accurately to user input. The successful implementation and testing results demonstrate that the Laravel-based application is effective, reliable, and capable of supporting hotel operations in a modern, digital environment.

In conclusion, this application provides a sustainable and scalable solution that enhances customer experience, optimizes internal processes, and increases the overall efficiency of hotel management at Abadi Hotel.

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