Web-Based Digitalisation of Front Desk Agents to Support Tourism Services at Urban Camping Hostel

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ABSTRACT
As the frontline of the business, the front desk agents are required to provide information quickly and accurately. However, the initial service management system at Urban Camping Hostel was still conventional, with booking and guest registration processes recorded separately using Microsoft Excel. This manual system results in long queues, a waste of operational staff time when handling groups of guests arriving simultaneously, and a high risk of data inaccuracy. This research aims to transform these conventional service processes into a web-based digital system through the development of a Front Desk Application. The system development method used is the Waterfall model, encompassing requirements analysis, UML diagram design, coding using the Laravel framework and MySQL database, and testing via black box testing. The results of the study indicate that this web-based application is capable of integrating room data processing, bookings, customer identity records, and the issuance of invoices in a unified manner. This digital transformation has successfully improved the efficiency of receptionists' working time, eliminated data recording errors, and provided real-time visualisation of room availability to support the enhancement of tourism service quality at Urban Camping Hostel.

Keywords: *Digitalization, Front Desk Agent, Web Application, Urban Camping Hostel, Tourism Services.*

1. INTRODUCTION

The development of information and communication technology in the modern era is advancing at a rapid pace, driven by the expansion of the internet. Internet access has had a significant impact on transforming various commercial activities, including both the buying and selling of products and the provision of services that can be accessed digitally (Hasanah & Untari, 2020). Within a corporate environment, the implementation of web-based applications has become the primary choice to ensure seamless cross-platform access without hardware compatibility issues (Saputri & Eriana, 2020). The development of these interactive web system interfaces is generally designed using a combination of structural markup languages and visual style sheets (Cooper, 2014; Duckett, 2014). To enable the system to process every data request from users dynamically and automatically, this functionality is supported by a reliable server-side programming language such as PHP (Riswandi, 2019).

In the tourism industry, the utilisation of information technology is a key pillar determining operational efficiency as well as the competitiveness of accommodation businesses. According to macro data from the Central Statistics Agency (2022), there are approximately 339 hotels and similar accommodation businesses operating in Central Java. This high level of competition compels hospitality businesses to improve the quality of their services, where the speed and accuracy of information processing play a vital role. Front Desk Agents or receptionists are the first line of service who interact directly with tourists; consequently, they are required to provide information on room availability and handle transactions quickly and accurately.

Urban Camping Hostel is one of the open-air accommodation businesses in the Boja area facing service management challenges as visitor numbers surge. Although room capacity continues to increase to meet market demand, operational mechanisms in the front office are deemed suboptimal due to the continued use of conventional methods, namely recording customer registration data and room bookings using separate Microsoft Excel spreadsheets. This manual workflow leads to long queues in the lobby when groups of guests arrive simultaneously, causing physical fatigue for staff, and carries a high risk of data inaccuracies. This administrative issue aligns with empirical studies regarding the urgency of accountability, operational knowledge, and service capacity management in reducing work constraints within an organisational environment (Sari & Muhammad, 2019).

To resolve these issues, a restructuring of the information system is absolutely necessary through the utilisation of an integrated relational database management system (Alia et al., 2023; Putri, 2022). The logical storage of interrelated data is designed to meet the organisation's information needs centrally, so that searches for records of past

guests can be retrieved instantly without causing redundancy (Connolly & Begg, 2015). The implementation of a Database Management System (DBMS) such as MySQL has proven effective in facilitating real-time operations for retrieving, adding, and updating room availability data (GoalKicker.com, 2018), as evidenced by the successful digitalisation of asset inventory reporting already implemented across various public service institutions (Sarmidi & Ujang, 2019).

Digital transformation at the Urban Camping Hostel is realised through the design and development of a web-based Front Desk Application. To ensure the developed software system possesses high reliability and targeted functionality, its development methodology is systematically guided using the linear sequential Waterfall model (Titania & Zulfachmi, 2021). The process of collecting system requirements was carried out through a structured approach involving field observations and a review of scientific literature (Rahman et al., 2022). The results of the requirements analysis were then transformed into object-oriented modelling using Unified Modelling Language (UML) objects to comprehensively map actor interactions with the reservation, monitoring, and financial reporting functions (Rosa A.S., 2022). Through this automation, receptionists' work processes can operate more effectively and efficiently to support excellence in tourism services.

2. RESEARCH METHODS

2.1. Research Design

This study employs a software engineering research approach focused on the development of object-oriented information systems. The system development method applied is the linear sequential model, more commonly known as the Waterfall model. This model was chosen because it provides a systematic and orderly software lifecycle approach, in which each stage must be fully completed before moving on to the next stage, making it highly suitable for building applications with requirements specifications that have been clearly defined from the outset of the research (Saputri & Eriana, 2020; Titania & Zulfachmi, 2021).

2.2. System Development Phase

In accordance with the Waterfall model framework, the specific stages of the web-based Front Desk Application development process are outlined as follows:

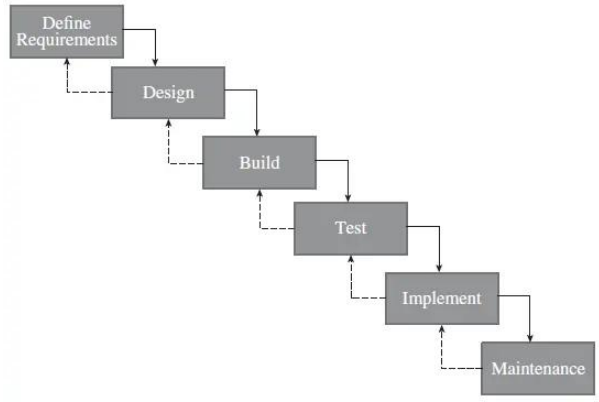

Figure 1. Waterfall Development Model

Requirements: This initial phase focuses on gathering information and conducting an in-depth analysis of the system requirements for digitising the front desk agent's functions. Data collection was carried out through direct observation of the manual registration process and structured interviews with accommodation staff (Rahman et al., 2022). In this case, a process was carried out to identify the weaknesses of the separate, conventional Microsoft Excel-based record-keeping system. From this analysis, the functional requirements of the new system were determined, such as login authentication for security, a feature for inputting new customer data, a room booking form, automatic calculation of rental rates for 36 rooms, and instant visualisation of room availability data to speed up service for tourists.

Design: Once the requirements specification has been agreed, software architecture and data storage structures are modelled before proceeding to the coding phase. Specific implementation is carried out on the functional requirements, which are transformed into object-based visual blueprints using the Unified Modelling Language

(UML), such as Use Case Diagrams, Activity Diagrams, Sequence Diagrams, and Class Diagrams (Rosa A.S., 2022). At this stage, an Entity Relationship Diagram (ERD) is also modelled to design a relational database structure consisting of integrated tables (such as customers, booking, and room_lists tables) to avoid redundancy or overlap of operational data (Alia et al., 2023; Putri, 2022).

Build: This stage involves the process of translating the design specifications into actual programme code so that the system can operate dynamically. The specific implementation was carried out in the development of a web-based Front Desk Application using the PHP programming language, utilising the Model-View-Controller (MVC) architecture of the Laravel framework (Saputri & Eriana, 2020). The user interface (UI) was designed using HTML and CSS to produce a responsive web page that is easy for receptionists to use (Cooper, 2014; Duckett, 2014). All dynamic data activities are directly linked to the MySQL Database Management System (DBMS) (Riswandi, 2019).

Test: Once the code development process is complete, all application modules must undergo functional testing before being deployed to the hostel's actual operational environment. The application's functionality was evaluated using the Black Box Testing method (Saputri & Eriana, 2020). Testing focused on observing the web interface's inputs and outputs without examining the internal structure of the code. Specific tests include validating admin account access rights, the accuracy of guest identity record storage without errors, the correctness of automatic total bill calculations during booking, and the function for exporting and printing payment invoices.

Implement: The implementation phase is the stage at which the web application, having passed testing, begins to be integrated into the live working environment at Urban Camping Hostel to replace the conventional booking system. At this stage, the software is deployed on a local or comparable server and configured so that it can be accessed by the computers at the reception desk via web browsers such as Google Chrome or Mozilla Firefox. This stage also involves the migration of historical data from existing customers to the MySQL database, as well as user training for Front Desk Agents to familiarise them with operating the new digital system.

Maintenance: The final stage of the Waterfall cycle involves regular maintenance of the live system to ensure the application continues to perform effectively in supporting long-term tourism operations. This includes carrying out bug fixes for minor post-release issues, performing regular database backups to prevent the loss of booking transaction history, and implementing system updates. In the future, this maintenance phase will also facilitate the development of new features, such as plans for integration with electronic payment systems (payment gateways), to enhance service satisfaction for tourists.

3. RESULTS AND DISCUSSION

3.1. Class Diagram

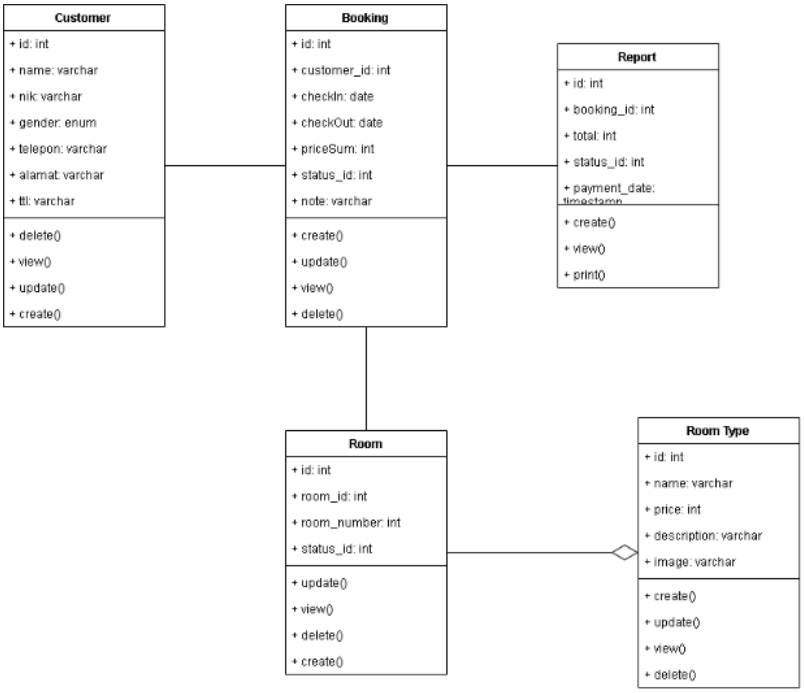

Figure 2. Class Diagram for Website Application

The class diagram from figure 2 for the digitalization and transformation of services at Urban Camping Hostel has been adapted to meet the requirements of the entities using this system. The classes used include User, which manages the Front Desk Agent's credential data; Customers, which records tourist identities to speed up the registration process and avoid retyping when returning guests arrive; RoomTypes and RoomList, which identify the rooms provided by the hostel; Statuses, which indicate whether a room is available or not; Booking and RoomBooking, which handle the main booking transactions for room reservations; and Reports, which display financial and sales reports.

3.2. Sequence Diagram

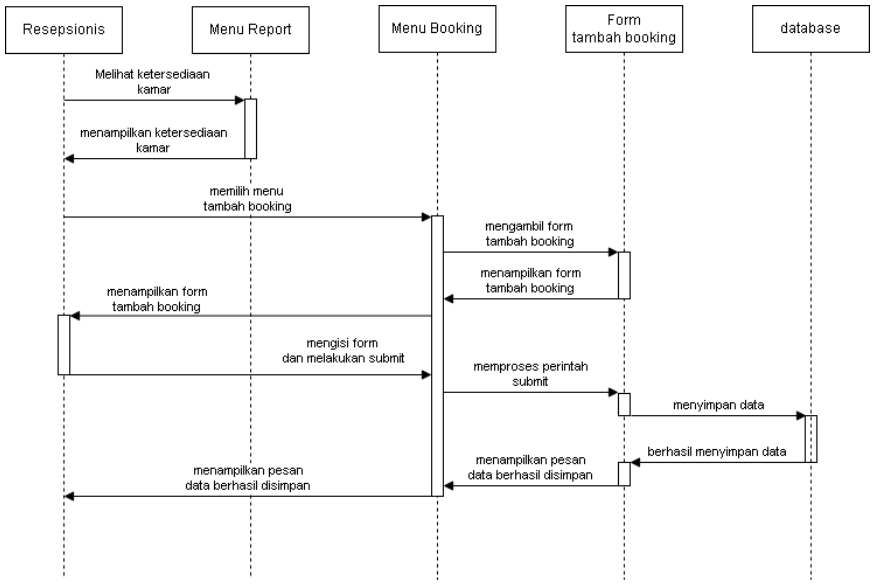

Figure 3. Sequence Diagram for Website Application

A sequence diagram is a form of representation of a class diagram used to illustrate each menu to be created on the website and to facilitate the identification of each system that has been developed in relation to the features and objects defined in the preceding class diagram. In Figure 3, there are menus for accessing the receptionist menu, the reports menu, the booking menu, the booking form, and the database, all of which have been aligned with the preceding class diagram.

3.3. Design Web

Once the system design and user interface design have been completed, the next step is to carry out the coding. The coding is carried out in accordance with the designs that have been created to prevent any system malfunctions. Below is a screenshot of the coded website in figure 4 until 7.

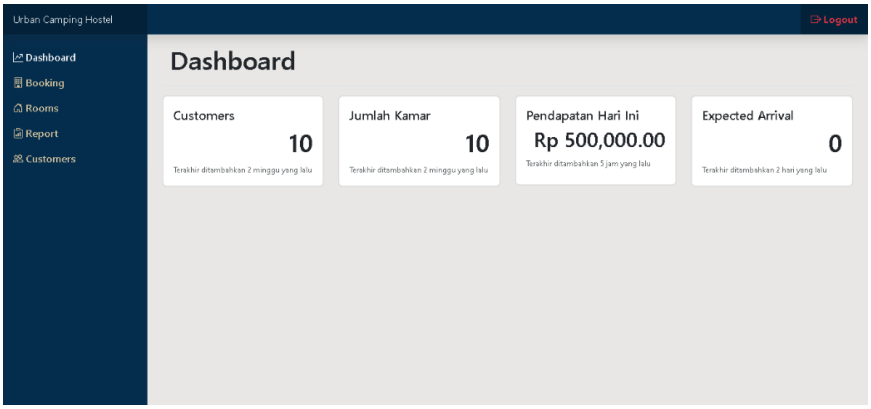

Figure 4. Dashboard page web for hostel application

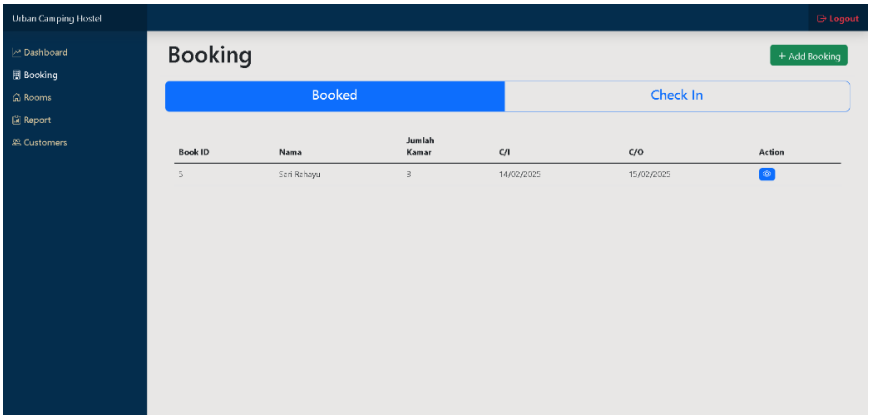

Figure 5. Booking page web for hostel application

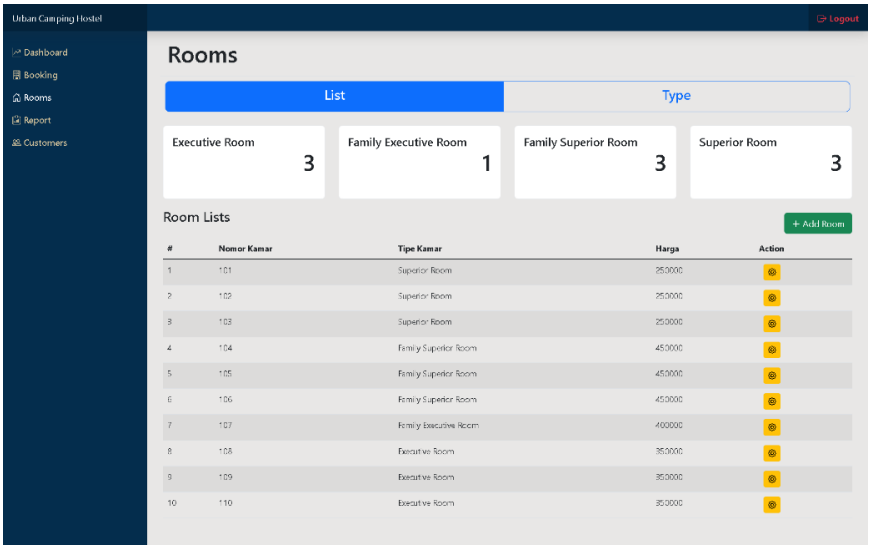

Figure 6. Room page web for hostel application

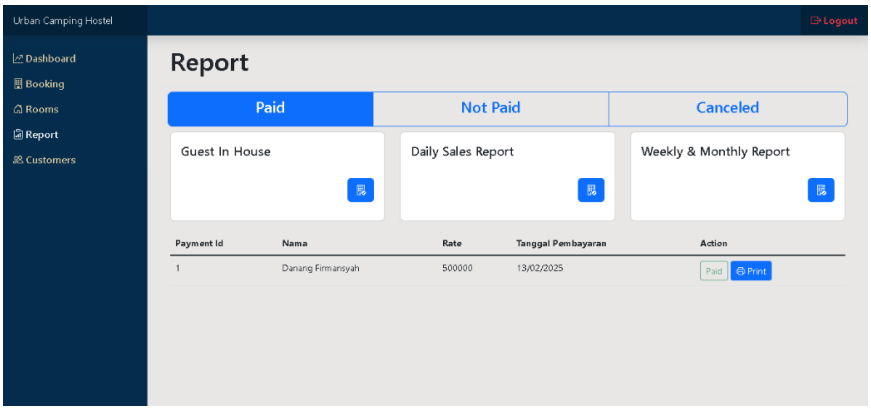

Figure 7. Report page web for hostel application

3.4. Evaluation

For the evaluation process, a black-box approach is used for each system test planning process. The system test planning process is illustrated in Tables 1 and 2 as an example.

Table 1. Black Box Model Evaluation Identification

Item Evaluation	Evaluation Detail	Evaluation Type
Login	Login verification	Black Box
Managing booking data	Add booking data	Black Box
Managing customer data	Change customer data	Black Box

Table 2. Black Box Testing Model

Testing with Correct Data		
Input	Admin	Username : admin Password : 12345
Expectation	The username and password entered are correct and you have been taken to the dashboard page	
Action	The system displays the dashboard page	
Result	The data entered is correct	
Testing with Wrong Data		
Input	Admin	Username : admin Password : 112233
Expectation	The system displays a message stating that the username or password is incorrect	
Action	The system displays a message stating that the username or password is incorrect	
Result	The password entered is incorrect	

Testing with Correct Data		
Input	Admin	Customer_id : 1 Check In : 14/02/2025 Check Out : 15/02/2025 Room : 101 Price : 300000 Note :
Expectation	The data entered is correct. Return to the booking page and a message will appear stating that the booking details have been successfully added.	
Action	Return to the booking page and a message will appear stating that the booking details have been successfully added	
Result	The data entered is correct	
Testing with Wrong Data		
Input	Admin	Customer_id : 1 Check In : 14/02/2025 Check Out : 15/02/2025 Room : Price : 300000 Note :
Expectation	The system displays a message stating that the room selection must be completed	
Action	The system displays a message stating that the room selection must be completed	
Result	Room not selected	

4. CONCLUSION

Based on the discussion and findings presented in the previous chapter, the following conclusions can be drawn:

With the development of a web-based Front Desk Application at Urban Camping Hostel, data processing has become faster and more efficient, significantly helping to speed up the work of staff at Urban Camping Hostel

The system developed is designed to process booking data, customer data, room data, and payment invoice data, which can subsequently be summarised into a report

In the development and design of the system, the tool used was UML (Unified Modelling Language), which includes sequence diagrams and class diagrams

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