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# IMPLEMENTATION OF A WEB-BASED ONLINE RESERVATION SYSTEM AT JIMMY SALON

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**Abstract**

Digital transformation in the beauty service industry has highlighted the need for efficient and accessible reservation systems. This study aims to design and implement a web-based online reservation system without user registration at Jimmy Salon to improve service booking convenience and operational efficiency. The development approach applies the Waterfall model, which consists of requirement analysis, system design, implementation, testing, and maintenance stages. The system was built using PHP, HTML, and CSS, and tested using the Black Box method to validate feature functionality according to specifications. The implementation results show increased reservation efficiency, a reduction in average transaction time from 15 minutes to approximately 3 minutes, and an improved user experience through a responsive and user-friendly interface. The study also recommends future enhancements such as automated notifications and digital payment integration to support the digital transformation of MSMEs in the beauty sector.

**Keywords:** Online Reservation System, Web-Based Application, Waterfall Model, Black Box Testing, Digital MSMEs, Jimmy Salon

## INTRODUCTION

Digital transformation has become an essential force driving structural changes across various industries, including the beauty service sector. The rapid advancement of information technology offers new opportunities for entrepreneurs to simplify business processes, increase operational efficiency, and meet customer expectations for convenience, speed, and personalized experiences. In today's competitive service environment, adopting digital technology is no longer an option but a necessity to sustain business growth and maintain customer loyalty. However, many micro, small, and medium enterprises in the beauty sector still depend on manual systems that are inefficient and prone to errors. Manual reservation processes, which rely on handwritten notes or informal text messages, often result in scheduling conflicts, inaccurate data management, and long waiting times (Gustiara et al., 2024; Bangsawan, 2023).

These limitations illustrate the gap between modern customer demands and the outdated operational systems still used by many small businesses. In an era where consumers


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increasingly expect instant and accessible services, manual systems hinder efficiency and reduce competitiveness. Implementing a web based online reservation system is therefore a strategic solution to overcome these challenges. The system allows customers to independently make reservations anytime and anywhere using digital devices. At the same time, administrators can access booking data, customer preferences, and service histories in real time, improving time management and resource allocation (Mirza et al., 2023; Permatasari et al., 2024).

Beyond operational efficiency, a web based reservation system also enhances the professional image of a business. The transition from manual to digital processes results in a more organized workflow and a better overall customer experience. Research shows that integrating technology into customer service can significantly improve satisfaction and loyalty by providing faster and more personalized experiences (Bolton et al., 2018). Thus, adopting an online reservation platform is not only a technical improvement but also part of a broader digital transformation strategy to strengthen the competitiveness of small businesses in the beauty industry.

Jimmy Salon, a local beauty service business located in Nabire Regency, provides a variety of services, including bridal makeup and wedding cake orders. Like many small enterprises, Jimmy Salon still manages its reservations manually, either through direct in person visits or short message service communication. While this traditional method may seem simple, it has proven ineffective for handling multiple customer requests simultaneously. The salon often experiences scheduling overlaps, missed appointments, and inaccurate record keeping. In addition, some customers prefer a quick reservation process without registration, creating the need for a more flexible digital system that can accommodate such preferences (Kalawa Putri et al., 2024).

To address these challenges, this study proposes the development of a web based reservation system that does not require user registration. The system is designed to support two main services, bridal makeup and wedding cake orders, and features an intuitive interface that simplifies the booking process. The design prioritizes accessibility, ensuring that users with different levels of digital literacy can operate it easily. The system also focuses on functionality, responsiveness across various devices, and efficient data processing to support administrative needs.

The research adopts the Waterfall development model, which involves a structured sequence of stages including requirements analysis, system design, implementation, testing, and maintenance (Wijaya & Lestari, 2022). The Waterfall model is suitable for small and medium scale projects where system requirements are clearly defined from the beginning. This approach ensures systematic development and thorough documentation, which contributes to quality control. The testing process uses the Black Box testing method, which evaluates the system's performance by analyzing input and output without examining internal code (Zulkarnaini et al., 2023; Anjarsari & Ardiani, 2023). This method helps ensure that the system's features run effectively and that users experience smooth operation.

The unique aspect of this research lies in its focus on a system that allows customers to make reservations without registration, which is rarely implemented in similar web based applications. This approach suits the needs of small businesses in areas with diverse digital literacy levels and limited internet infrastructure. By eliminating the registration step, the

system reduces barriers for first time users while maintaining data accuracy and security through automatic transaction recording.

In conclusion, the goal of this study is to design and implement a practical, efficient, and user friendly web based reservation system for Jimmy Salon. The system aims to increase operational effectiveness, improve customer service, and strengthen the salon's professional image. Moreover, it can serve as a prototype for other small businesses, especially in rural areas, to begin their digital transformation journey without requiring high costs or complex technical expertise. From a broader perspective, this research supports the growth of digital innovation in Indonesia's service industry by emphasizing usability, functionality, and customer satisfaction (Walden et al., 2020).

## IMPLEMENTATION METHOD

This study applied a software engineering approach to develop a web-based online reservation system without user registration for Jimmy Salon. This approach was chosen because it combines systematic analysis with the principles of user-centered design (UCD), emphasizing user needs, practicality, and accessibility—particularly relevant for micro, small, and medium enterprises (MSMEs) that require simple and efficient digital solutions (Gustiara et al., 2024; Walden et al., 2020).

The research adopted the Waterfall development model, which proceeds through sequential phases of requirements analysis, system design, implementation, testing, and maintenance. This model was selected because the system requirements were clear and stable, making it suitable for small-scale projects with limited resources (Wijaya & Lestari, 2022).

In the requirements analysis stage, data were collected through direct observation and semi-structured interviews with the owner of Jimmy Salon to identify functional and non-functional needs. Functional needs included booking without login, admin confirmation, and reservation history, while non-functional needs emphasized system speed, mobile accessibility, and ease of use. These findings were documented in a Software Requirements Specification (SRS) (Bangsawan, 2023).

The system design was carried out using Use Case Diagrams, Data Flow Diagrams (DFD), and Entity Relationship Diagrams (ERD) to visualize system flow and data structure. The user interface was designed with simplicity and intuitive interaction in mind, ensuring accessibility for users unfamiliar with digital tools (Bolton et al., 2018).

The implementation used PHP, HTML, and CSS for development, with MySQL as the database and XAMPP as the local server. The system consists of modules for customers, administrators, and database management. The login-free concept was adopted to streamline the booking process and improve service efficiency (Permatasari et al., 2024). The system was tested using the Black Box Testing method to ensure that each function worked properly according to specifications (Zulkarnaini et al., 2023). The results showed that the system performed effectively, with all core functions operating as expected. Finally, evaluation and maintenance were carried out based on user feedback, which led to interface adjustments and improved categorization of services. Regular updates were planned through a feedback loop to ensure long-term usability (Sibarani et al., 2023).

Overall, the use of the Waterfall model combined with UCD principles resulted in a

system that is structured, efficient, and responsive to user needs. This method was deemed more appropriate than Agile for the study's limited scope and resources, making it suitable for application in similar MSME environments (Dima & Maassen, 2018; Mirza et al., 2023).

## RESULTS AND DISCUSSION

The results and discussion led to the successful implementation of the application based on the research method applied.

### Use Case Diagram

The Use Case Diagram was designed to illustrate the relationship between the users and the system. This diagram describes the interactions and functions that users can perform within the application environment.

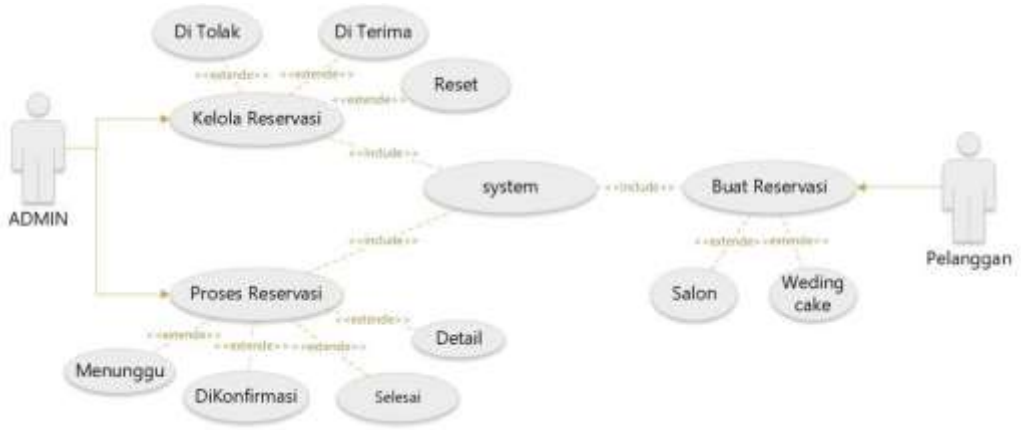


**Figure 1. Use Case Diagram**

### Activity Diagram

The Activity Diagram is used to depict the flow of actions and activities that can occur either sequentially or in parallel within the system. It serves to visualize the overall workflow and process of the application (Sibarani, Harahap, & Meilina, 2023).

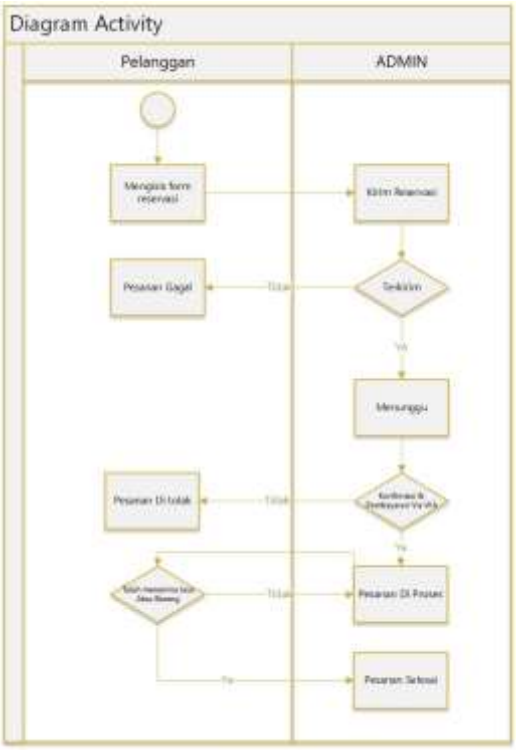


**Figure 2. Activity Diagram**

**Interface Implementation**

The implementation of the web-based online reservation system for Jimmy Salon includes several core features designed to simplify the process of booking bridal makeup and wedding cake services. The system was developed without a user registration mechanism, allowing customers to directly access the reservation form, enter service information, and submit booking requests efficiently.

The Home Page presents a navigation menu that directs users to the reservation page, salon service information, wedding cake orders, and the admin login page. The interface emphasizes simplicity and ease of navigation, featuring a soft color palette and balanced contrast suitable for both desktop and mobile use.


**Figure 3. Home Page Display**

The Reservation Page provides a form where customers can enter their name, email, phone number, select the type of service (bridal makeup, graduation makeup, classic cake,

modern cake, or a combination of both), and specify the desired service date and time. Once submitted, the data are automatically stored in the database, and the admin receives a notification on the backend dashboard.

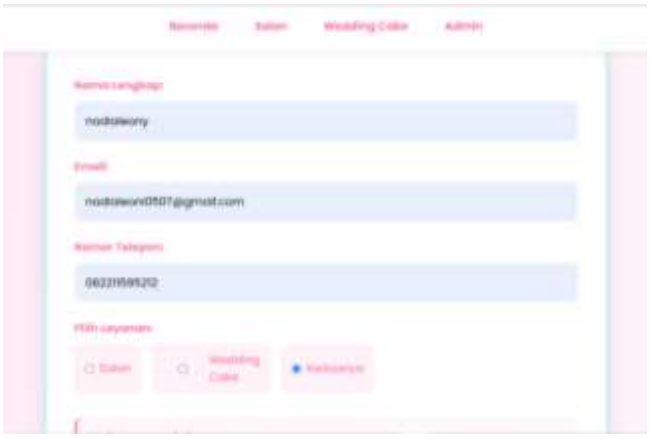

**Figure 4. Reservation Page**

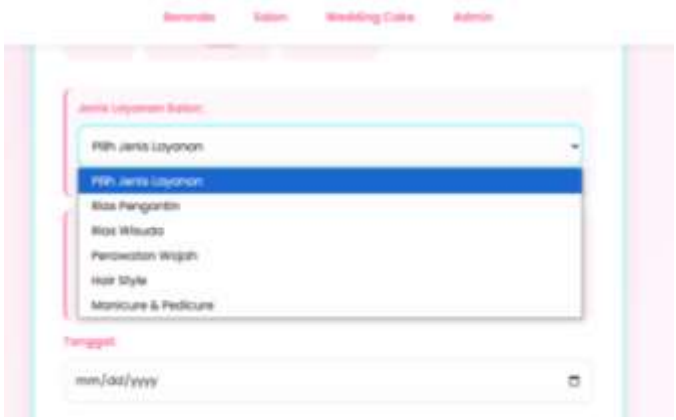


**Figure 5. Reservation Page – Service Type Selection**

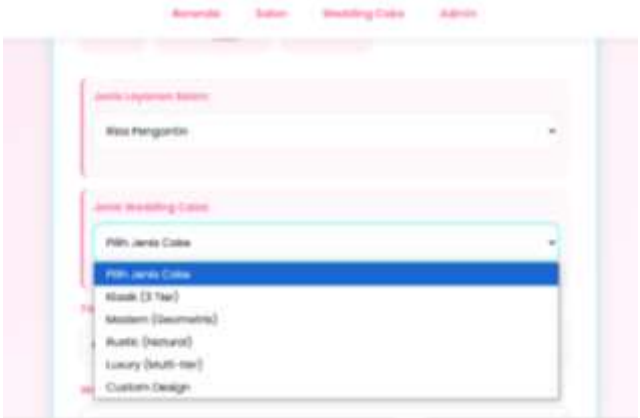


**Figure 6. Reservation Page – Cake Type Selection**

**Figure 7. Reservation Page – Date, Time, and Additional Order Options**

The Admin Login Page serves as the access point for administrators to log into the system securely.


**Figure 8. Admin Login Page**

The Admin Page allows administrators to view new bookings, confirm reservations, and manage service statuses. Each reservation entry is displayed with detailed information, including buttons for viewing details and updating status (new, confirmed, completed). Additionally, admins can contact customers directly through email or phone for follow-up communication.


**Figure 9. Admin Page**

**System Testing**

The system testing phase was conducted using the Black Box Testing method, which focuses on validating the system's functionality based on user interactions without analyzing

the internal code structure. This approach ensures that each feature performs as intended from the user's perspective.

**Table 1. Summary of Black Box Testing Results**

| No | Feature Tested | Input | Expected Output | Status |
|---|---|---|---|---|
| 1 | Reservation Form | Name, Email, Phone Number, Service Type, Date/Time | Data successfully submitted and stored in the database | Successful |
| 2 | Admin Login Page | Username and Password | Redirects to the admin dashboard | Successful |
| 3 | Reservation Confirmation by Admin | Click "Approve" button | Reservation status changes to "Confirmed" | Successful |
| 4 | Menu Navigation | Click "Salon," "Wedding Cake," or "Reservation" menus | System displays the corresponding page | Successful |
| 5 | Admin Login (Failed Attempt) | Incorrect Username/Password | System displays a "Login Failed" message | Successful |

The testing results show that all core features operated according to expectations, with no major functional errors detected. Furthermore, the web-based reservation system significantly improved efficiency by reducing the average reservation time from 15 minutes (manual process) to approximately 3 minutes. This enhancement not only accelerated the booking process but also minimized data entry mistakes and improved service reliability for both administrators and customers.

**Discussion and Reflection**

The results of the testing and implementation stages show that the developed web-based reservation system successfully addressed the main operational challenges faced by Jimmy Salon. Integrating two distinct services, makeup appointments and wedding cake orders, into a single platform improved workflow efficiency and enhanced the professional image of the business in the eyes of customers. This finding is consistent with the study of Ardolino et al. (2017), who explained that digital technologies play an important role in transforming service industries by optimizing resource utilization and improving customer engagement.

Eliminating the need for user registration became one of the most effective design decisions. This approach simplifies the booking process for new customers, allowing them to place reservations immediately without technical barriers. Such accessibility aligns with the findings of Maulida et al. (2022) and Permatasari et al. (2024), who highlight that a simple and direct user flow encourages higher adoption among users with varying levels of digital literacy. Similarly, Adducul (2020) found that easy access increases user acceptance in mobile ticketing systems, a principle that is also relevant for small service industries such as beauty salons.

The Waterfall development model proved effective for small and medium enterprises with well-defined requirements and limited resources, supporting the findings of Wijaya and Lestari (2022) and Rachma and Muhlas (2022) that it ensures stability in low-complexity projects. This study also applied a user-centered design approach to align system features with Jimmy Salon's customer needs, consistent with Ariessaputra et al. (2022) and Walden et al. (2020), who noted that user-focused design enhances usability and customer satisfaction.

In a broader context, this implementation reflects the ongoing shift toward digital transformation in Indonesia's creative and service sectors. Bangsawan (2023) and Lei et al. (2024) stated that the digital economy plays a vital role in promoting innovation and productivity, especially among small businesses. Likewise, the adaptation of Jimmy Salon to a web-based reservation system reflects the findings of Han (2023) and Li et al. (2024), who noted that digital platforms empower service-based enterprises to achieve greater integration, transparency, and scalability.

Although the developed system demonstrates promising results, it still has several limitations, such as the absence of automated notifications via email or WhatsApp and the lack of integrated digital payment options, which have become standard in modern service applications (Anjarsari & Ardiani, 2023; Kalawa Putri et al., 2024). Future development should address these aspects to enhance operational efficiency and customer convenience, as automation has been shown to improve user satisfaction in similar systems (Ramadhan et al., 2023). Moreover, digital tools can redefine customer experiences by integrating online convenience with personalized service, emphasizing the need to balance technological efficiency and human interaction (Bolton et al., 2018). Therefore, future improvements should include personalization and analytical features to anticipate customer preferences, supporting the view that understanding digital consumer behavior offers a strategic advantage in the digital economy (Koch & Windsperger, 2017).

In conclusion, the web-based reservation system implemented at Jimmy Salon illustrates how small businesses can utilize simple yet effective digital solutions to enhance efficiency, accessibility, and customer satisfaction. The combination of a structured development model, user-centered design, and continuous evaluation makes the system a sustainable model for digital transformation in the beauty service sector. Further development, especially in automation and payment integration, will strengthen system scalability and ensure alignment with evolving customer expectations.

## CONCLUSION

Based on the design and implementation results of the online reservation system at Jimmy Salon, it can be concluded that the system was successfully developed using the Waterfall method, which applies a systematic, step-by-step development approach. The system includes essential features such as user registration, service selection, reservation scheduling, and data management by the administrator. Through black-box testing, the system demonstrated stable performance and was easily accessible to end users. Its responsive interface and intuitive navigation flow enhanced user convenience in making independent reservations. Overall, the system provides a practical solution to overcome the challenges of manual queues and service record management that previously occurred at Jimmy Salon.

To improve the usefulness and scalability of the system, several aspects can be considered for future development. Integrating digital payment features, such as QRIS or e-wallets, will streamline customer transactions. Automatic notification reminders via email or instant messaging applications can enhance the reservation experience. Strengthening system security through HTTPS protocols, token validation, and data encryption is also recommended to meet online safety standards. Additionally, developing an analytics

dashboard for the administrator to monitor reservation trends, as well as creating a mobile application for broader accessibility, would further optimize system performance. Lastly, conducting a user experience (UX) evaluation using methods like the System Usability Scale (SUS) could provide valuable insights into user satisfaction and system usability.

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