DESIGN OF A WEB-BASED REGIONAL FOOD ORDERING INFORMATION SYSTEM AT SERIBU RASA RESTAURANT

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Abstract - The rapid development of information technology has presented significant opportunities for the culinary industry to improve operational efficiency and customer satisfaction. Seribu Rasa Restaurant, offering regional Indonesian specialities, faces challenges with its manual order management system, leading to long queues, extended waiting times, and limited access to menu information. This highlights the importance of adopting a web-based information system to enhance customer experience and business efficiency. This study aims to design a web-based food ordering information system for Seribu Rasa Restaurant to simplify the ordering process, expedite transactions, and improve data management. Using the Waterfall methodology, the research followed a systematic approach comprising requirements analysis, system design, implementation, testing, and maintenance. Data collection was conducted through interviews with restaurant management, observation of business processes, and a literature review. The system was developed with modern web technologies such as HTML, CSS, and JavaScript, with MySQL for database management. The results show that the developed system enables customers to easily browse menus, place orders, and make integrated payments online. System testing indicates that key features, including menu browsing, order placement, and online payment, function effectively and meet user needs.

Keywords: Information System, Food Ordering, Web-Based System, Waterfall, Culinary Industry.

I. INTRODUCTION

In the ever-growing digital era, information technology has become an inseparable element in various sectors, including the culinary industry. Digitalization in this sector has opened up opportunities to significantly improve operational efficiency and service quality [1]. However, many restaurants in Indonesia still use traditional methods in managing ordering systems and customer data. Seribu Rasa Restaurant, which offers a variety of typical dishes from various regions in Indonesia, faced challenges in managing the food ordering process manually. The manual system used causes long queues, long waiting times, and limited customer access to menu information, which has the potential to reduce customer experience and satisfaction [2].

This problem reflects the need for digital transformation that can provide innovative solutions to overcome operational obstacles. In the face of increasingly fierce competition in the culinary industry, restaurants are required to provide services that are faster, more efficient and easily accessible to customers [3]. Thus, this research is critical for designing systems that not only address these problems but also encourage restaurant competitiveness through improving customer experience.

The superiority of web-based technology compared to other digital solutions makes it the main choice in developing modern information systems. This system can be accessed easily via various devices connected to the internet, such as computers, tablets or smartphones, without requiring the installation of additional applications. Additionally, the web-based system supports centralized software updates, so any changes or feature improvements are immediately available to all users [4]. This provides flexibility and ease of management, as well as reducing required operational costs.

In addition to technical efficiency, web-based systems also have advantages in terms of scalability and integration [5]. This system can easily be increased in capacity to support a larger number of users or add new features according to business needs. The ability to integrate with third-party services, such as digital payment systems, customer data analysis and logistics management, further strengthens its relevance as a technology solution in the culinary industry. By adopting a web-based system, restaurants can utilize technology to support data-based decision-making and increase competitiveness in the digital era.

This research aims to design and implement a web-based food ordering information system that can improve operational efficiency and customer satisfaction at Seribu Rasa Restaurant. The system development process is carried out using the Waterfall methodology approach, which includes requirements analysis, system design, implementation, testing and maintenance [6]. This methodology was chosen because it is systematic and structured, allowing each stage to be carried out thoroughly to produce a system that suits user needs.

The urgency of this research lies in the need to present innovative solutions that can improve operational efficiency and restaurant service quality. One relevant approach is the development of a web-based information system. The web-based system allows customers to view menus online, order food without having to wait long and make payments in an integrated manner. Thus, this system not only helps restaurants manage order data more effectively but also provides a better user experience. Web-based technology is the best choice compared to other digital solutions because it has various advantages. Web-based systems can be accessed easily via various devices connected to the internet, such as computers and smartphones, without requiring the installation of additional applications [7]. In addition, the system supports centralized updates and maintenance, reducing the costs and efforts required to manage technology. The ability of web-based systems to integrate with third-party services, such as digital payments and customer data analysis, further strengthens their relevance in meeting modern business needs [8].

II. SIGNIFICANCE OF THE STUDY

A. Literature Study

Research on web design to optimize service time, efficiency and user-friendliness has been carried out. Design and implementation of a web-based food ordering information system for the Tropical Group Bali in order to address the challenges faced by the company in its manual food ordering process [9]. Development of a web-based information system for a hotel restaurant using the CodeIgniter framework, with the goal of improving guest satisfaction in terms of service and information provision [10]. The development of a mobile-based catering application to improve the ordering process for customers of the Tebar Rasa restaurant [10]. Web-based reservation system for a restaurant to solve existing reservation problems and improve customer service, using the waterfall methodology for system development [11], [12]. The software development method is a framework used to structure, plan, and control the process of developing an information system[13], [14]. This article focuses on developing a web-based food ordering information system for restaurants that serve typical food from various regions in Indonesia. This approach is unique because it integrates the promotion of Indonesian culinary diversity with digital technology, which has not been the focus of much previous research. In this study, the development of the web-based regional speciality food ordering information system at Seribu Rasa Restaurant adopts the Waterfall method. This method was chosen due to its systematic and structured approach, allowing each stage in the development process to be carried out sequentially and thoroughly [15].

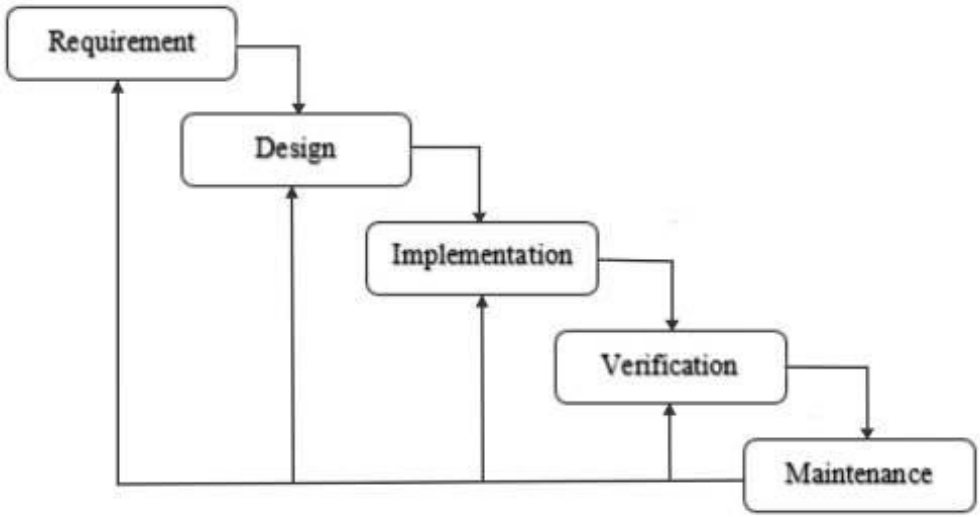

Figure 1. Waterfall Model

The Waterfall model is one of the approaches in the System Development Life Cycle (SDLC) commonly applied in information system development. The Waterfall method follows a sequence of steps carried out in order during the software development process [7]. The Waterfall model is very advantageous in this scenario because of its systematic approach, compliance with clearly defined needs, and its ability to produce a reliable and well-documented system. This ensures that the food ordering information system developed can be implemented smoothly and meet the operational and customer needs of the restaurant. The Waterfall method consists of several main stages: requirements analysis, system design, implementation, testing, and maintenance. Below is a detailed explanation of each stage:

1. Requirements Analysis

This stage aims to identify and document the system requirements, both from the perspective of users and restaurant managers. The analysis is conducted through interviews with the restaurant owner, observation of ongoing business processes, and data collection through literature studies. The result of this stage is a Software Requirements Specification (SRS) document, which contains information about the features the system must provide.

2. System Design

At this stage, the system architecture is designed, including database structure, user interface (UI) design, and process flow (flowchart). The UI/UX design considers ease of use (usability) for customers and restaurant managers. Additionally, Class diagrams, Use Case diagrams, and Activity diagrams, as examples of Unified Modeling Language (UML), are used to model the system clearly and structurally.

3. Implementation

Implementation involves the process of coding or programming the system based on the design results. Technologies used include programming languages such as HTML, CSS, and JavaScript, as well as frameworks that support modern web development (e.g., NodeJS). The database is designed using MySQL or PostgreSQL to centrally manage customer, menu, order, and transaction data.

4. Testing

Testing is divided into three stages: Unit Testing (conducted on specific parts of the program code), System Testing (to evaluate system performance when all modules are integrated), and Acceptance Testing (performed with or on behalf of customers to ensure all customer needs are met).

5. Maintenance

After the system is implemented, the maintenance stage involves fixing bugs, adjusting the system to new requirements, and ensuring optimal system performance. Maintenance also includes adding new features if needed in the future. The Waterfall method provides a structured framework for system development, where each stage must be fully completed before proceeding to the next, thereby minimising the risk of errors caused by the disorder. Moreover, the documentation produced at each stage helps the development team understand the overall development process. By applying the Waterfall method, it is hoped that the development of this information system will proceed as planned, resulting in an optimal solution to improve the quality of services at Seribu Rasa Restaurant, as well as providing a better ordering experience for customers.

III. RESULT AND DISCUSSION

A. Use Case Diagram

The only actor involved is the customer, who uses the system to select menu items, place orders, make payments, and view transactions and report data. Activity Diagram: Customer Accessing the Main Page. Start: The customer initiates the process by opening the system. Main Page Displayed: The main page of the application is shown to the customer. Navigate Options: The customer chooses from the available features (e.g., select menu, place order, view transaction data, or report data). Proceed: The customer interacts with the selected option. End: The activity is completed based on the customer's choice.

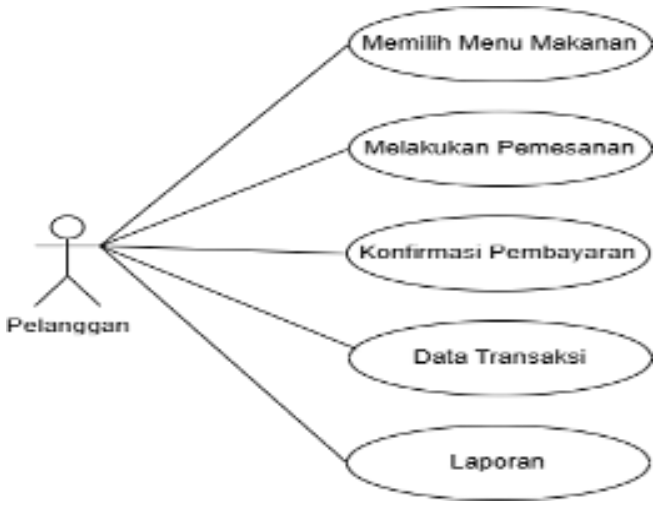

Figure 2. Usecase Diagram

B. Activity Diagram

The activity diagram in this article describes the flow of user and system activities in the food ordering process at Seribu Rasa Restaurant. This diagram starts with the customer opening the main page of the web-based system, where the system displays the main interface with various available features. Next, the customer selects the desired food menu, and the system will display detailed

information regarding that menu. If the customer wants to add another order, the process will return to the menu selection step. However, when the order is complete, the customer is directed to fill in shipping information, such as address and contact. After the delivery data is filled in, the system will display payment details, including the total cost to be paid. The customer then makes a payment, and the system provides confirmation that the transaction has been successful. This activity flow reflects a structured interaction between the customer and the system, ensuring that each step in the ordering process is carried out efficiently and seamlessly. This diagram also illustrates how the system provides automatic responses to every customer activity, from displaying menus to managing payment confirmations, thereby supporting an optimal user experience.

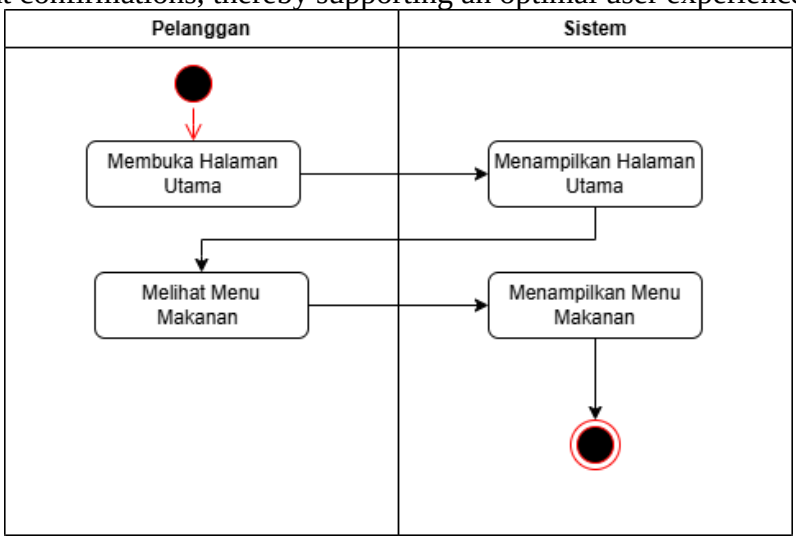

Figure 3. Activity Diagram

In figure 3, the customer accesses the main page, then the system displays the page. Next, the customer selects a food menu, and the system displays the menu.

C. User Interface

1. Main page

Figure 4. Main page

Figure 4 shows the web page interface of the restaurant "A Thousand Flavors," which is designed to provide an engaging and informative user experience. At the top, there is a main navigation menu with several options such as Menu, Recommendations, Articles, Messages, and About Us, which makes it easier for visitors to access features which are desired. The middle of the page displays a

visual element in the form of an image with the caption "Always Fresh, Always Healthy," which emphasizes the restaurant's mission of serving fresh and healthy Indonesian specialties since 2020. This description provides information about the restaurant's dedication to maintaining food quality and customer experience. The About Seribu Rasa button is provided to direct users to further information regarding the restaurant. Below that, there is a section "Our Offers," which introduces the interesting Indonesian menu offered by the restaurant. This design combines visual and text elements to attract customers' attention while providing relevant information, demonstrating a good combination of functionality and aesthetics in web-based information system design.

2. Recommendation page

Figure 5. Recommendation page

Figure 5 shows the "Recommendations page" on the website of the restaurant "A Thousand Flavors". This page displays two featured food menus, namely Rawon and Sop Konro, each accompanied by images, short descriptions, prices and star ratings from customers (4.8/5 for both menus). Each menu is equipped with details such as ingredient composition (for example, for Rawon: rice, rawon, salted egg and shrimp crackers) as well as an Order button that allows users to order directly through the site. The design is simple but informative, designed to make it easier for customers to choose recommended menus quickly and conveniently.

3. Menu page

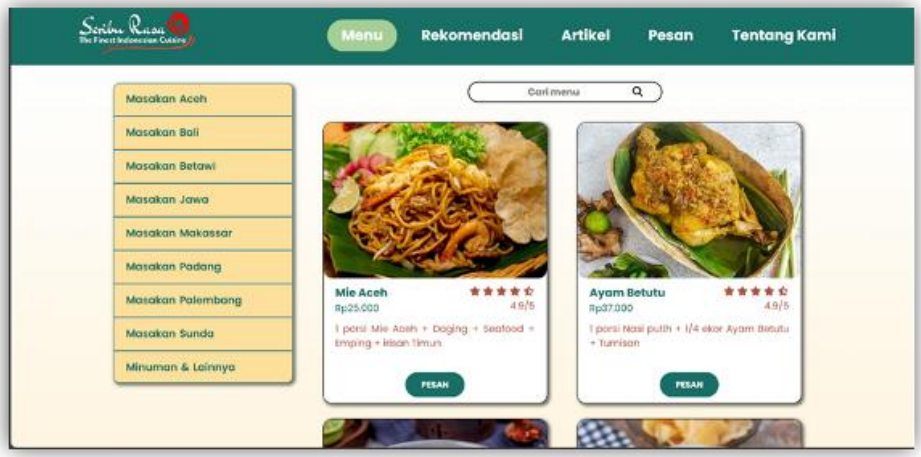

Figure 6. Menu page

Figure 6 shows the "Menu" page on the website of the restaurant "Seribu Rasa." This page has culinary category navigation on the left side, such as Acehnese Cuisine, Balinese Cuisine, Betawi Cuisine, to Drinks & Others, which makes it easier for users to choose the type of food. In the middle, there are two menus displayed, namely Mie Aceh and Ayam Betutu, each equipped with an image, short description, price, star rating (4.9/5), and an Order button to make the ordering process easier. In addition, there is a "Search menu" search feature above the food list to help users quickly find a specific menu. This design prioritizes user comfort in exploring the various food choices offered.

4. Order page

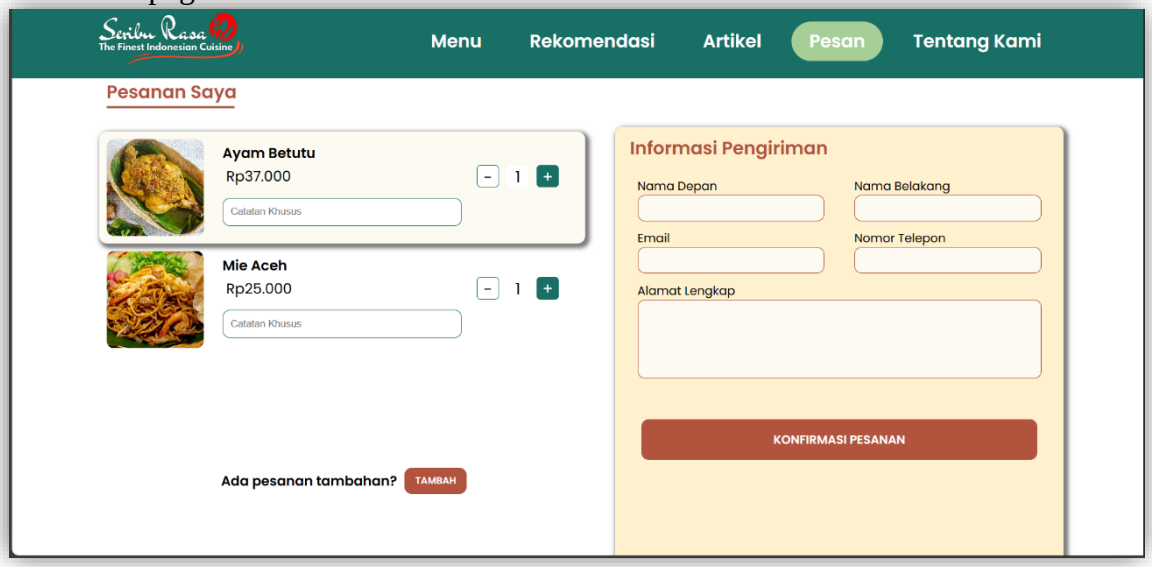

Figure 7. Order page

After selecting the food menu on the menu display, the data stored in local storage will then be displayed on the message display. This display has 2 parts, the first is my order section in this section contains the previously selected food menu. Then the second part is shipping information, users who have previously selected the food menu can fill out a form containing the destination for sending the food

D. Testing System

The technique used in this testing is using a black box. The testing process is carried out based on previously defined test scenarios, in which the main focus is on whether the performance results of the system are successful or not [16]. Results from the black box testing of the system being developed can be seen in Table 1.

Table 1. Black Box Testing

Test Description	Expected Results	Test Results
Test Login System		
Login using admin account 1	will enter the dashboard page and there is a menu, order, packing and user list page	Succeed
Login using admin account 2	will enter the dashboard page and there is an order page	Succeed
Login using admin account 3	will enter the dashboard page and there is a menu list page	Succeed
Login using admin account 4	will enter the dashboard page and there is a packing page	Succeed
Test the Profile Menu		

Enter the old password and the appropriate new password	A warning will appear "Password changed successfully"	Succeed
Enter an old password that is not appropriate	A warning will appear "Password does not match"	Succeed
Test Dashboard Page		
Click the place order button	You will be redirected to a page for adding orders	Succeed
Test Menu List Page		
Click the add menu button and add a new menu	Displays the message “The menu list was successfully added”	Succeed
If the photo does not match the format (jpg, jpeg, png)	Displays the warning “This is not an image file, the file cannot be uploaded”	Succeed
If one of the forms is not filled in	A warning appears to fill in a form that has not been filled in	Succeed
Click the edit action button and fill in the appropriate data order	Displays data editing information, and if successful will display the information "Menu list edited successfully"	Succeed
Click the delete action button	Displays a warning "Do you want to delete (menu name to be deleted)" click delete and the data will be deleted	Succeed
Test the Order Page		
Click add order	A warning appears "Order data entered successfully" and will switch to the Order Item page	Succeed
Click the add item button and fill in accordingly	Fill in the menu name, order quantity and optional notes.	Succeed
orders	Click save changes, a warning will appear "Order item entered successfully"	Succeed
Click print note	Will display a transaction note	Succeed
Click the edit action button	It will display the order data that has been entered in detail about the product ordered and can be edited again if the order has not been processed	Succeed
Test Page Packing		
Click the button in the accept action column	When the accept button is clicked an order description page will appear and a command button to close and accept the order will appear. If you click accept order, the warning "Successfully received order by packaging department" appears and the status changes to processed. And the active action button is the Ready to Submit button	Succeed
Klik tombol siap diserahkan kolom aksi	If you click Ready for Delivery, a warning about the order details will appear, a close button and a Give to customer button will appear. If click Give to customer. Then a warning will appear "The order has been packaged and is ready to be handed over to the customer". After that the status changes to finished	Succeed
Test User Page		
Click the add user button and fill in all the data	The system will receive and a warning will appear "User successfully added"	Succeed
requested	The system will refuse and a warning will appear to enter data in columns that have not been filled in	Succeed
Click the add user button and there is data	Fill in all the commands and fill in a different username. Click save changes "User data updated successfully"	Succeed
not filled in	A warning page appears "Are you sure you want to delete the user (user name to be deleted)", if you click delete then the user data will be deleted	Succeed
Click the edit user data action button and fill in all the commands	A warning appears "Are you sure you want to reset the user password (which was deleted) to the default system password, namely multitask?" click reset, then the password will become multitask	Succeed

IV. CONCLUSION

The conclusion of this article is that the implementation of a web-based information system at Seribu Rasa Restaurant has succeeded in increasing operational efficiency and customer satisfaction. This system is designed using the Waterfall model which supports structured development, from requirements analysis to implementation. Key features, such as online ordering, menu category navigation, and a recommendation system, make it easy for customers to choose and order food while speeding up the order management process by the restaurant. The use of web-based technology has proven to be a superior solution compared to other digital methods due to its high access flexibility, allowing customers to access services from various devices without requiring additional installation. The system also supports information transparency, such as menu details, prices and customer reviews, which increases user trust and experience. Overall, the implementation of this information system not only provides practical benefits in the form of increased productivity and customer satisfaction but also contributes to restaurant competitiveness in the digital era. This research can be a reference for developing similar systems in other culinary sectors.

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ACKNOWLEDGEMENT

We would like to express our sincere gratitude to all parties who have contributed to this research. Our thanks go to our colleagues who provided valuable suggestions, support, and inspiration throughout the research process. We also appreciate everyone who took the time to participate in this study. Furthermore, we would like to thank the institutions or organizations that provided support and facilities for conducting this research. All the contributions and assistance provided were crucial to the smooth running and success of this research. Thank you for all the hard work and collaboration that has been established.