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Development of a Web-Based Laundry Service Information System at Syafira Laundry

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Abstract

In the digital era, the need for fast and easy services encourages business actors to adopt information technology. Syafira Laundry still uses manual recording that is less efficient. This research aims to develop a web-based laundry service information system to improve operational efficiency and service quality. The methods used are the Waterfall model with the stages of needs analysis, system design using UML, implementation with PHP, MySQL, and CodeIgniter and Bootstrap frameworks, and testing using the Blackbox method. The results of the study show that the system built is able to manage transactions, financial reports, and service status in a computerized manner and provide faster and more accurate access to information.

Keywords: *Information Systems, Laundry, Website, Waterfall, CodeIgniter*

1. Introduction

Along with the development of the times and the advancement of information technology, the need for a fast, efficient, and easily accessible communication and information delivery system is becoming increasingly important. Modern society tends to rely on technology in daily activities, including in terms of transactions and services. Web-based information systems are one of the popular solutions because of their advantages in ease of access, real-time data updates, and efficiency in information management. Information system is a system designed to collect, process, store, and disseminate information to support decision-making, coordination, control, and analysis in an organization or agency.

According to Anggraeni & Irviani [1]. Information systems are a combination of hardware, software, networks, and human resources used to process data into useful information. Information systems can help an organization manage data in a more structured and efficient manner so as to facilitate the implementation of tasks and the achievement of goals.
A website is a collection of pages that are interconnected and can be accessed through the internet network using a browser. Websites usually contain information in the form of text, images, videos, or a combination of both, and can be static or dynamic [2].

According to Ganney [3], a website is an internet-based means of conveying digital information that allows users to interact directly with the system. In the context of information systems, websites function as an interface between users and systems to facilitate access to information online, anytime and anywhere. Several previous studies have raised similar topics.

Riki Baehaki [4] proved that the waterfall method with a MySQL database is effective in building a laundry data management system. Gunawan shows that the use of the Bootstrap framework results in a website that is responsive to different screen sizes of devices. Meanwhile, Ropianto developed a PHP-based laundry information system to help the transaction process and financial recording. The Waterfall method itself is one of the approaches to software development that is systematic and sequential, with stages starting from needs analysis, design, implementation, testing, and maintenance. This method is widely used because it provides a clear structure and is suitable for systems with predefined needs from the beginning. [5]

Until now, there has been no research that integrates the Waterfall method, PHP programming language, MySQL database, Bootstrap framework and CodeIgniter in the development of a comprehensive web-based laundry service information system. This gap is the basis for this research. [6] Syafira Laundry, located at Jl. Pramuka No. 15, Karawang Kulon Village, West Karawang District, Karawang Regency, has been operating since June 8, 2020 and currently still relies on a manual system in recording and transactions. The entire ordering process, from clothing receipt to payment, is done directly on-site and recorded using a simple notebook or worksheet. With an average of 30 to 50 customers per day, this manual recording method began to pose various obstacles. Notebook logging often takes 2–3 minutes per transaction, so when customers explode, the queue can get longer and reduce customer convenience. In addition, the risk of miswriting or missing records may result in incorrect cost calculations or inaccurate order status information, potentially leading to customer complaints. Searching for transaction history data is also inefficient, as employees have to open records one by one to find specific data, which can take a few minutes for just one customer request. As a result, the speed and quality of service become hampered, especially during peak hours or when many customers take orders at the same time.

Based on this gap, a Web-Based Laundry Service Information System was developed at Syafira Laundry, which was designed using the waterfall method with stages of analysis, design, implementation, testing, and maintenance. The system is built using PHP, MySQL, Bootstrap Framework and CodeIgniter to support a responsive and dynamic display. The resulting system includes features such as customer data management, transactions, services, administrative reports, system users, and real-time laundry status information.

2. Literature Review

2.1 Information Systems

Information systems are a combination of information technology and the activities of people who use these technologies to support management and operations. According to Anggraeni & Irviani [7], an information system is a system that provides information for management in making decisions and running company operations, where the system is a combination of people, information technology, and organized procedures. With an information system, the process of processing data into information can be carried out more quickly, efficiently, and accurately, making it easier for an organization to manage data in a structured and systematic manner.

2.2 Website

According to Ganney [8], a website is a collection of information or digital pages that can be accessed through the internet. The website allows users from various locations to obtain information or interact with the system online, anytime and anywhere, as long as they are connected to the internet.

2.3 Unified Modeling Language (UML)

UML is one of the widely used language standards in the industrial world to define requirements, create analysis and design, and describe architectures in object-oriented programming [9].

2.4 Use Case Diagram

Use Case describes an interaction between one or more actors and the information system to be created [10].

2.5 Sequence Diagram

Sequence Diagram is a UML that describes the interaction between objects in and around the system, including users, displays, and so on in the form of messages that are depicted against time [11].

2.6 Activity Diagram

An activity diagram describes the workflow or activity of a system or business process or menu on the software [12].

2.7 Software Development Life Cycle (SDLC)

The Software Development Life Cycle (SDLC) Waterfall Model is a linear and sequential approach to software development, where each stage must be completed first before proceeding to the next stage. This model is suitable for use if the system needs are clearly defined from the beginning and rarely experience changes during the development process [13]. The main stages in the SDLC waterfall include: Requirement, Design, Implementation, Testing, Deployment, and Maintanance [14].

2.8 Web Browser

R. Abdulloh [15] stated that a website can be interpreted as a collection of pages that contain digital data information either in the form of text, images, animations, sounds and videos or a combination of all of them that are provided through internet connections so that they can be accessed and seen by everyone around the world.

3. Methodology

3.1 Needs Analysis

This stage aims to identify the needs of users and systems through observation of Syafira Laundry's business processes, interviews with owners and employees, and study of transaction documents and financial statements, so that a list of functional (e.g. order management, laundry status, financial statements) and non-functional (such as ease of use and data security) is obtained.

3.2 System Planning

The design was carried out using Unified Modeling Language (UML) which included the creation of a Use Case Diagram to describe the interaction of users (admins and customers) with the system, Activity Diagram and Sequence Diagram to describe the process flow, database design using Entity Relationship Diagram (ERD), and interface design based on responsive design with the Bootstrap framework so that it can be accessed from various devices.

3.3 System Implementation

The implementation was carried out using the PHP programming language with the CodeIgniter framework and MySQL database. This framework was chosen because it supports structured development, good security, and is easy to maintain. The user interface is created

using a combination of HTML, CSS, JavaScript, and Bootstrap to produce a responsive and user-friendly look.

3.4 System Testing

The test is conducted using the BlackBox and WhiteBox Testing methods, which focus on testing the functioning of the system without paying attention to the internal program code. The goal is to ensure that each feature works according to the needs that have been set at the analysis stage.

3.5 Maintenance

This stage is carried out after the system is implemented and used by the user, with the aim of fixing bugs or errors that arise, making small adjustments according to user needs such as adding simple features or improving appearance, and maintaining system performance to remain optimal and in line with technological developments.

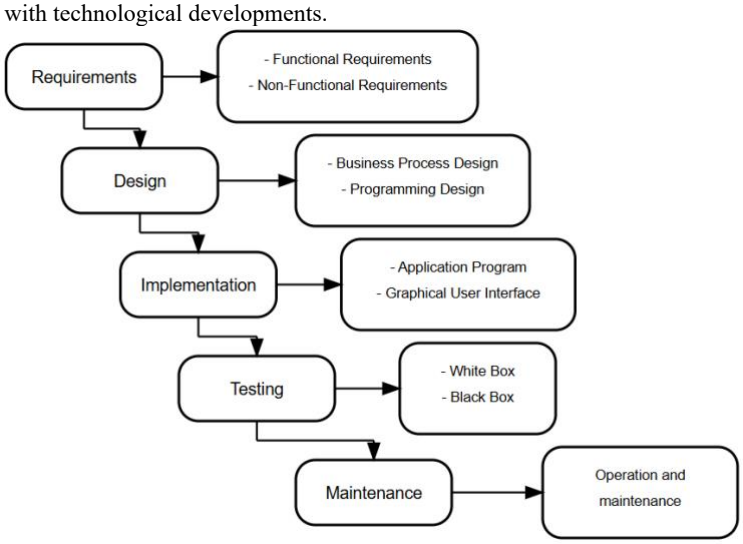

Fig.1: Research Methods

4. Results and Discussion

4.1 Data Analysis

Since its establishment a few years ago, Syafira Laundry still relies on manual methods in making transactions and recording order data. This causes the data processing process to take a long time, is less efficient, and has the potential to cause errors in the preparation of reports To improve operational efficiency at Syafira Laundry, a website-based information system was developed that can speed up the transaction process. With this system, it is hoped that the work environment will be more productive and able to provide more optimal services.

4.2 System Planning

In the process of designing a website-based Laundry Service Information System, Unified Modeling Language (UML) is used as a system modeling tool. In this section, there are several diagrams used to illustrate the system as a whole, namely the Use Case Diagram, Activity Diagram, Sequence Diagram, and Entity Relationship Diagram (ERD).

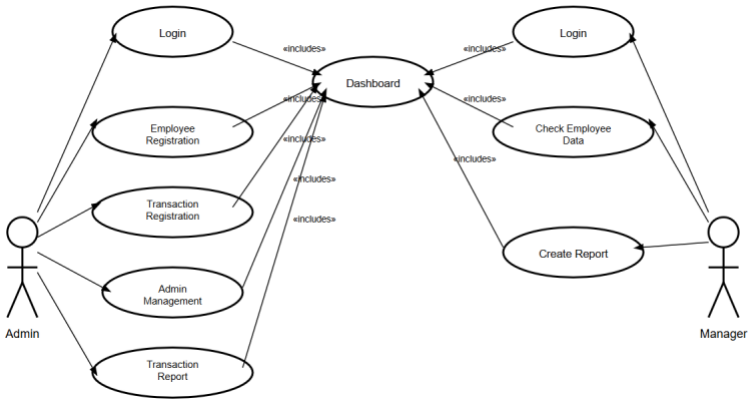

Fig. 2: Use Case Diagram

4.3 System Implementation

The implementation stage is carried out after the system analysis and design process is completed on the Waterfall development model. Implementation begins with setting up a development environment using XAMPP as a local server and MySQL
as a database. The CodeIgniter framework was chosen as the primary framework for separating application logic, interfaces, and data processing through a Model-View-Controller (MVC) approach. The database structure that has been designed in the previous stage is implemented through phpMyAdmin by creating tables and relationships according to the design. Furthermore, program code is developed in stages ranging from models for database interactions, controllers for process logic, to views as user interfaces. The results of the implementation show that the system can run well on a local server. Key features such as order management, transaction logging, and laundry status reporting can be accessed through a web browser and run according to the needs that have been defined at the analysis stage. This implementation forms the basis for testing the system in the next stage to ensure all functionality is working as intended.

a. Login

The Login page functions to enter the system application by entering a username and password.

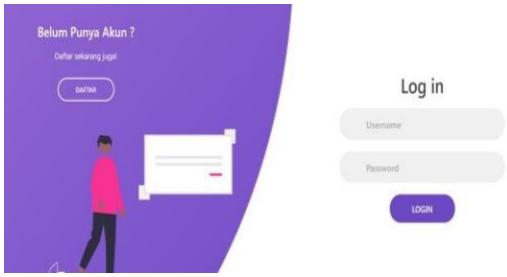

Fig. 3: Login page

b. Customer Menu

Customer menu is a menu that can be accessed by customers or members who order, starting from choosing a service, making transactions or payments, viewing order details, and viewing the history of orders that have been made.

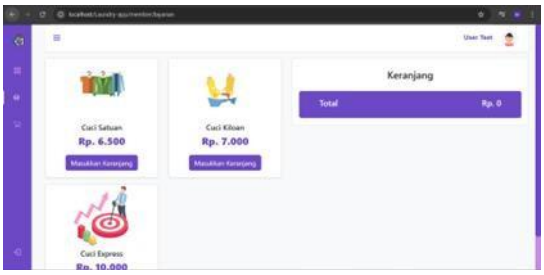

Fig. 4: Service Page

Fig. 5: Checkout Page

c. Most recent booking

The booking page serves to display all orders, order status and order details.

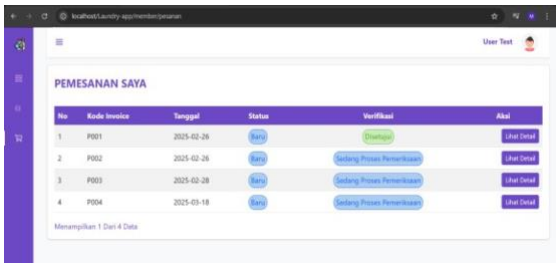

Fig. 6: Booking page

d. Menu Admin

The admin menu is a menu that can be accessed by administrators or parties who are authorized to control all laundry business activities. Such as accessing the dashboard page, admin settings, member or customer settings, transaction settings, viewing transaction reports and viewing account profiles.

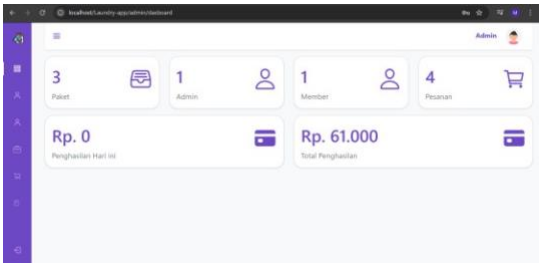

Fig.7: Dashboard page

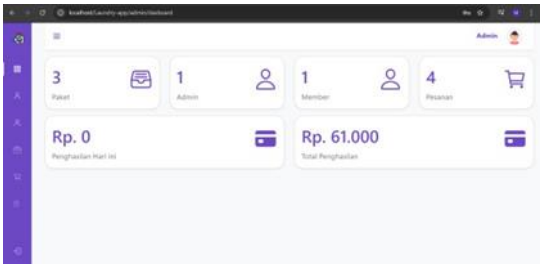

Fig. 8: Admin settings page

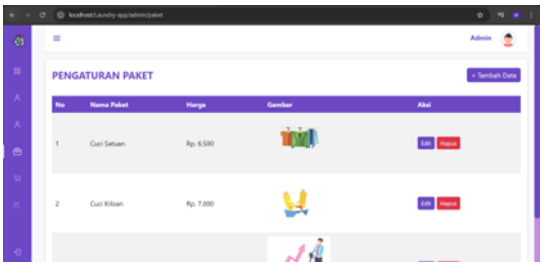

Fig. 9: Package Settings Page

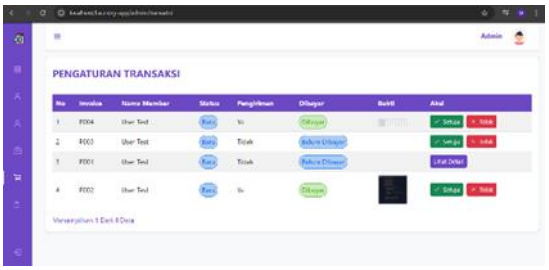

Fig.10: Transaction Settings Page

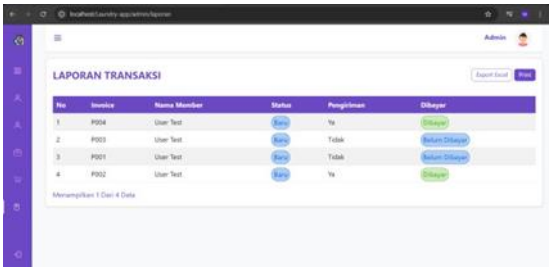

Fig.11: Report Page

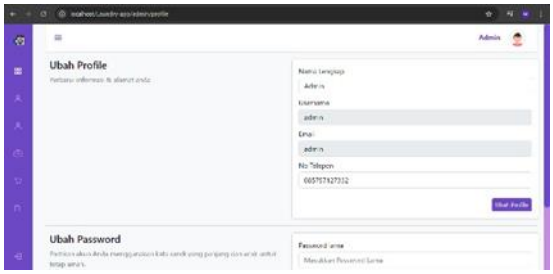

Fig.12: Profile Page

4.4 System Testing

a. Testing Login

Table 1: Blackbox testing login

Test Case	Test Steps	Expected results	Actual results	Information
Login	Click the login button	Will receive a member dashboard	Display dashboard menu member	Succeed

b. Testing customer menus

Table 2: Blackbox checkout page

Test Case	Test Steps	Expected results	Actual results	Information
payment	Click the *check out button*	Will display order details and a pay button	Display order details and a pay button to do the work	Succeed

Table 3: Blackbox service page

Test Case	Langk ah Test	Expected results	Actual results	Information
service	Click the service menu, click the cart input button	Will add orders as per the selected service	Orders are added according to the selected service	Succeed

c. Booking Testing

Table 4: Blackbox booking page

Test Case	Langk ah Test	Expected results	Actual results	Information
order	Click the order menu	Will display order details and status	View details and status order	Succeed

d. Testing Menu Admin

Table 5: Blackbox admin settings page

Test Case	Langk ah Test	Expected results	Actual results	Information
Admin settings	Click on the admin menu	Will display the admin settings menu	Display menu of the Uran Admin	Succeed

Table 6: Blackbox package settings page

Test Case	Langk ah Test	Expected results	Actual results	Information
Package settings	Click on the package menu	Will display the package settings menu	Display package settings menu	Succeed

Table 7: Blackbox transaction settings page

Test Case	Langk ah Test	Expected results	Actual results	Information
Transaction settings	Click the transaction fee	Will display the transaction settings menu	Transaction settings menu	Succeed

	menu	appears

Table 8: Blackbox transaction report page

Test Case	Langk ah Test	Expected results	Actual results	Information
Transaction reports	Click the transaction report menu	Displays the transaction report menu	Display the transaction report menu	Succeed

Table 9: Blackbox profile menu page

Test Case	Langk ah Test	Expected results	Actual results	Information
Menu profile	Click the profile menu	Will display the profile menu	Display profile menu	Succeed

4.5 Maintenance

The last step in the Software Development Life Cycle (SDLC) is the maintenance phase. This stage is carried out during the operation of the online application to ensure that the system remains well-run, stable, and can meet the needs of users over time. Furthermore, there are some routine jobs that need to be done by an administrator on the system that has been built. These tasks are critical to maintaining system performance and reliability. All stages of the System Development Life Cycle method are used in the design of a web-based laundry service information system at syafira laundry.

5. Conclusion

The web-based Laundry Service Information System was built using the Waterfall development method with PHP and MySQL technology. This system is equipped with automatic transaction recording features, order management, and real-time laundry status tracking. The implementation of this system is able to minimize manual recording, improve service efficiency, and minimize errors in the management of transaction and order data at Syafira Laundry.

The system test was carried out using the White box and black box testing methods on all modules that have been designed, including the features of transaction recording, order management, laundry status tracking, and transaction reporting. Test results show The success rate in all test scenarios has been prepared, so that the system has run according to the needs of users both from the admin side in managing transactions and customers in placing orders and monitoring laundry status.

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