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Application design for web-based car services to increase work time estimates

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ABSTRACT

The aim of this research is to increase the estimated service process time by creating an online-based car service ordering application at the Sinar Jaya repair shop and introducing information about Sinar Jaya car service services to the wider public. In this information systems research, the author of this research software development method uses the waterfall model development method. By implementing a waterfall, the research stages carried out by researchers start from data analysis, system analysis, system design, implementation, and testing. Creating a website-based car service ordering application at the Sinar Jaya Workshop can help customers find out the information available at the Sinar Jaya Workshop and the car service ordering process. Before there was an application, customers had to come to the location to place an order, so it took a long time to arrive at the location. So, with the online booking application, you can save time in the service process and get a queue number online. The data processing process for ordering car services becomes more practical so that it can be processed properly by the admin.

1. Introduction

Research [1] in 2020 entitled Mobile-Based Online Sales System for Refillable Drinking Water stated that current technological developments are developing

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like this quickly, starting from all aspects of human life using technology. Technology has become a necessity, and it cannot be separated from the lifestyle of human development, which is increasingly dependent on technology. Technological developments in the information business sector have had a major impact on improving business, especially in terms of information data processing which has a supporting effect in decision making and improving business services. Many companies are limited in marketing and selling their products, usually only within the company itself, this is because marketing is limited. The way to increase marketing area is by using the internet or online media.

Furthermore, from three studies [2] in 2017 entitled Design and Development of Information Systems for Sales, Purchase, and Spare Parts Inventory at the Tiga Putra Motor Garut Workshop and research [3] in 2016 entitled Design and Development of Android-Based Car E-Rental System Software PT Rajawali Panca Utama has concluded that using information systems can optimize work to be faster and more efficient and can improve service. Meanwhile, in this research, the author examines services that still do not use a booking system to serve service customers, which often results in the same queues and makes customers feel disappointed because they have to wait a long time.

Sinar Jaya Workshop is a workshop that provides car body and car paint services which is often called ketoc magic. This workshop still uses WhatsApp media to promote its services. Currently, Sinar Jaya Workshop is still providing services in the Banyuwangi area only. Sinar Jaya Workshop does not yet have a website that supports the service schedule process so the workshop's performance is not ineffective and efficient, as well as in promoting and introducing service services to the wider community, it does not yet have promotional media that can cover a wide market.

Utilization of information technology in the form of an information system that can be used to improve the performance of the Sinar Jaya workshop in terms of service delivery processes by increasing estimated work time. The use of internet technology in this case will be very useful for the Sinar Jaya Workshop because the internet can cover a wide market in order to introduce and promote the services available at the Sinar Jaya Workshop.

Based on this problem, Bengkel Sinar Jaya itself hopes to improve the quality of car service services in the future and maintain customer loyalty. To achieve this goal, the method is done by looking for literature that is believed to overcome these problems. Based on these problems, the author took the research object of "Application of the waterfall method in the online-based car service booking application at the Sinar Jaya workshop" to improve the performance of workshop services and introduce information about car service services to the wider community.

2. Method

The research software development method used is the application of the waterfall model development method [4]. Waterfall is a software development method or also known as the Software Development Life Cycle (SDLC) [5]-[6]. It is called waterfall because the development model is analogous to a waterfall, while the research stages used by researchers are carried out sequentially from top to bottom.

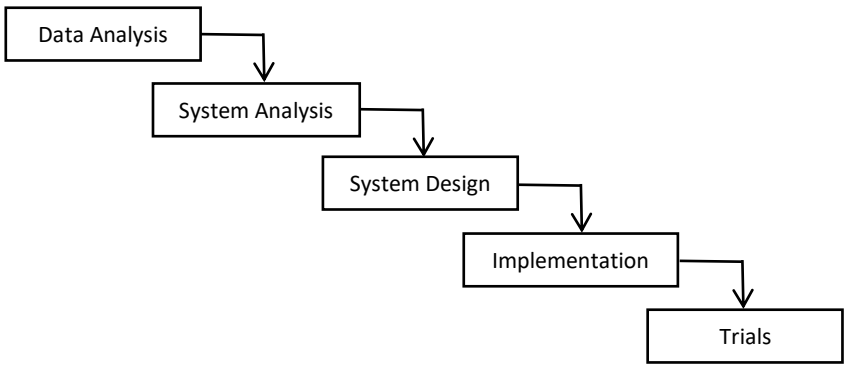

Figure 1. Research stages

Analysis Data

At the system requirements analysis stage, the author collects data, to obtain complete and clear information about the Sinar Jaya workshop. The following is an explanation of the stages of the data collection method used by the author:

1. Interview. Interview method or research interview, to find out problems related to the car service booking system. With a direct interview, Mr. Sutrisno, as the owner of the Sinar Jaya repair shop, aims to obtain information regarding the car service booking system process needed at the Sinar Jaya repair shop.
2. Observation
   By visiting the research site directly at the Sinar Jaya workshop to see the car service booking system that is currently running.
3. Bibliography
   This stage is carried out to collect data with information through various journals, books, and articles that are related to the problem to be discussed.

System Analysis

This stage is needed to design the system that will be created using the UML design in presenting system analysis. The system analysis is made starting from business processes, use cases, class diagrams, activity diagrams, and sequential diagrams. From this stage, we will proceed to the system design stage to support application creation.

1. System Design
   In determining the required system equipment, a new system design will be carried out which includes the system to be developed, the needs of the users involved in the system, and the system's working concept.
2. Implementation
   At this stage is the programming stage where the software will be divided which will later be combined at the next stage. And at this stage testing is also carried out and checking whether it meets the desired criteria.
3. Testing
   In the implementation stage, after all units have been developed and tested, they are then integrated into the overall system. After the integration process is complete, a thorough system inspection and testing are carried out to identify any system errors.

3. Results and Discussion

The research stages carried out include data analysis, system analysis, system design, implementation, and testing. The stages carried out in the research include:

Data Analysis

Data analysis is an important stage in developing a system. At this stage, user needs can be defined. This definition will have an impact on creating a system related to the needs of the application. Understanding the right needs will produce a system that suits your needs. Hardware is needed to carry out media design and program implementation and the software used in designing this research consists of several types of software. for hardware and software requirements are in Table 1.

Table 1. Hardware, and software requirements

Number	Need	Information
1	Hardware	a. Laptops b. AMD Dual Core E300 Processor c. Memory (RAM) 6GB d. Memory capacity (Hard disk) 500GB e. 5.14.0 Inches (35.56 cm) LED f. Other supporting hardware such as the mouse and Keyboard
2	Software	a. Windows 10/11 b. Visual Studio Code (VS Code) is used to write scripts for the website applications that are created. c. Corel Draw is used to create logo designs for companies that are used as research objects which will later be displayed on the website application. d. Xampp is used for database management for applications. e. Chrome is used to display the website applications created. f. Draw.io is used to create system designs.

g. Microsoft Word is used to write the results of the researched project assignments

System Analysis

The second stage was carried out to further assist the work and get a detailed picture of the system appearance. The design is carried out with the aim of providing an overview of what must be done and preparing the hardware requirements for creating the architecture of the software system that will be created.

In determining the required system equipment, a new system design is carried out which includes the system to be developed, the needs of the users involved in the system, and the system's working concept. system analysis includes UML. UML (Unified Modelling Language) is a visual modeling method for designing object-oriented systems. UML consists of business processes, use cases, activity diagrams, and sequence diagrams.

1. Business Process

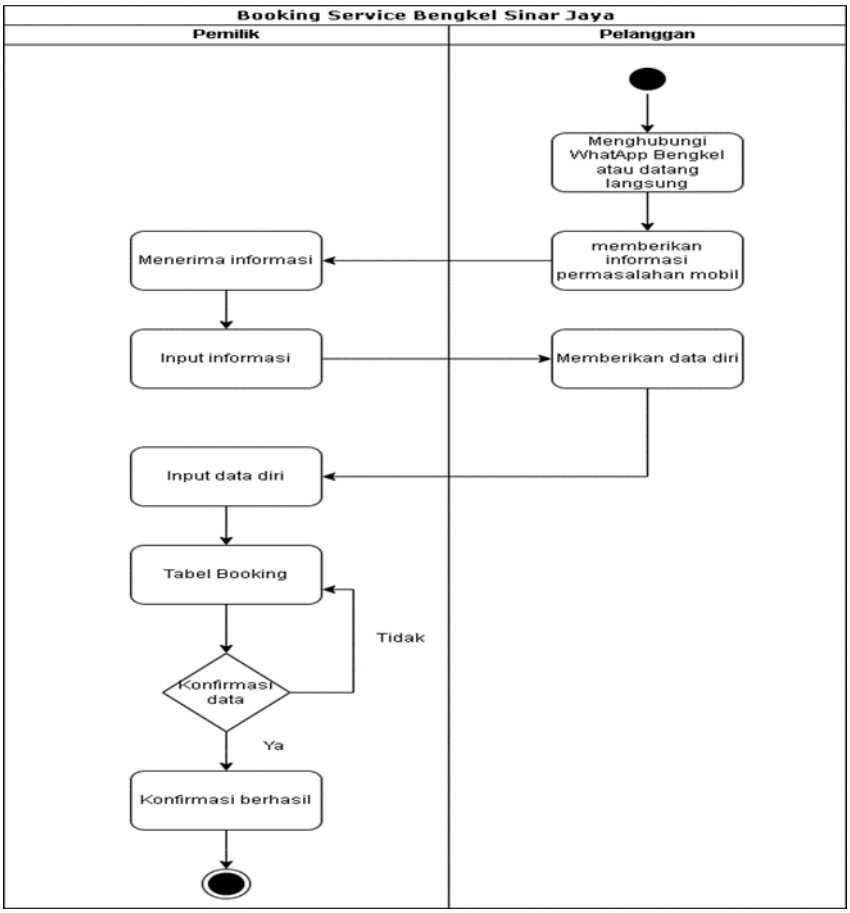

Figure 2. Business process of booking service bengkel sinar jaya

A business process is a structured collection of activities or work that are interrelated to solve a particular problem or which a business can break down into

several subprocesses, each of which has its own attributes but also contributes to achieving the goals of the super process.

Business Process booking service explains the ongoing booking flow, which consists of 2 actors including the owner and the customer. Customers must come to the workshop to order or reserve services provided by the workshop, and their personal data is written manually by the owner without a system.

The workflow description is represented by the business process and will explain how the workflow of the research system works this time. The workflow in question is the process starting from the workshop admin receiving information about ordering workshop services to contacting the workshop via WhatsApp. The customer will then provide information about the car to be serviced and the customer's personal data which will later be input into the system.

2. Use Case Diagrams

From research [7] in 2018 entitled Web-Based Sales Information System for Non-Alcoholic Perfumes at the Maju Pontianak Shop using Use Case Diagrams to determine what requirements are needed from the system. So, it can be described in detail how the system processes something, how actors will use the system, and what can be done with a system. The use case diagram above describes the activities that will be processed by the system such as the login process, input of customer booking data, confirmation of booking data, input of user login data.

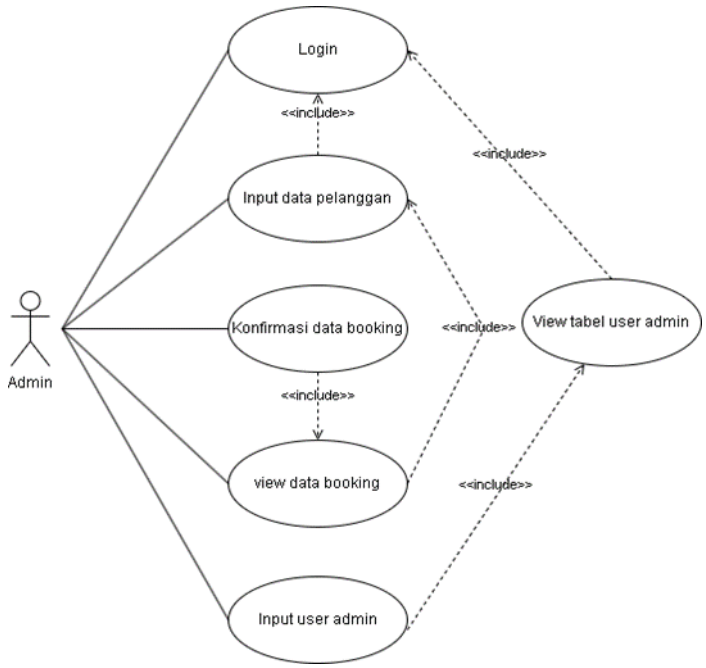

Figure 3. Use case diagram of activities that will be processed by the system

System Design

After the system analysis is carried out, the next stage is to create a system design to design the forms used in the application. The system designs created include:

Design The Dashboard Form

In the image above is the dashboard page, where the dashboard is the main display when the admin logs in with the registered username and password. On this dashboard page there are several buttons consisting of Input Booking, Booking Data, History, User, Close, the design is seen in Figure 4.

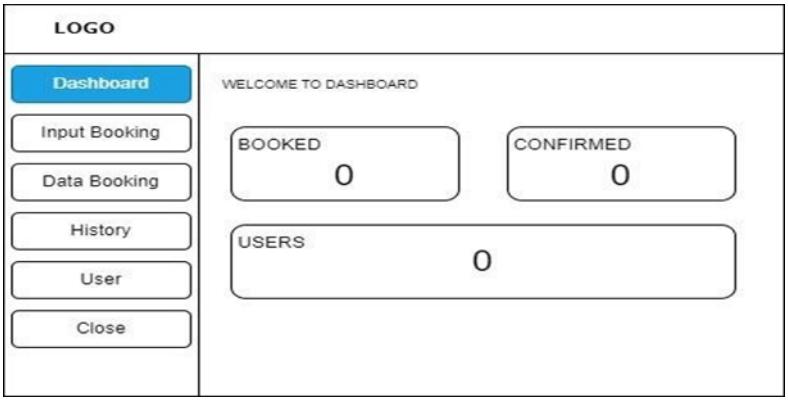

Figure 4. Design dashboard form

1. User Form Design

This page is the page where all account data for admin logins or accounts that can log in to the dashboard are stored. On this page there is name, username, and password data. And accompanied by buttons to add an account, edit an account, or delete an account.

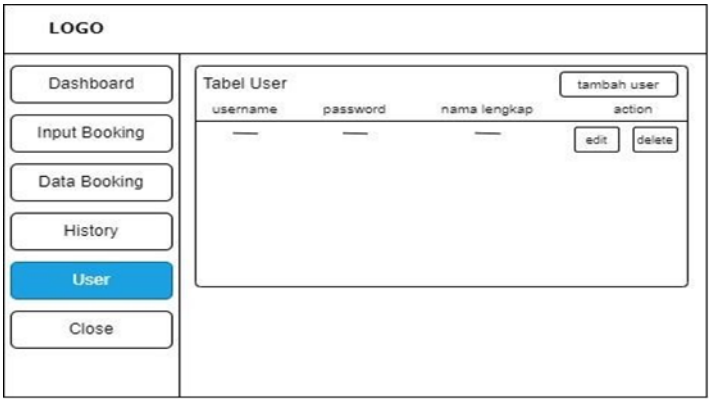

Figure 5. Design customer form

Implementation

This stage is carried out after the system design has been completed and will then be implemented in the programming language that will be used. The implementation goal is to apply the design that has been implemented to the system [8]-[9]. In the explanation, fragments and explanations of the program code will be presented. Before implementing the algorithm and methodology into the program, first create a command code to connect the application to the database using ORM (Object Relational Mapping) using prism. The database that will be used

is MySql. The Connection Program Segment to MySql Database Using Prisma ORM in figure 6.

```
generator client {
provider = "prisma-client-js"}
datasource db { provider = "mysql"
url  = env("DATABASE_URL")};
$s_idpegawai       = $_GET['sid_pegawai'];
$s_tanggal_kembali = $_GET['stanggal_kembali'];
$s_keperluan       = $_GET['skeperluan'];
```

Figure 6. The connection program segment to mysql database using prisma ORM

After the database connection is made, then create several forms for the booking application, including a booking data input form. This page is a page used to input customer data who want to book or order workshop services. This page contains various inputs such as name, booking date, information regarding specifications and car number, length of work or duration given by the workshop to customers, and queue number. The booking data input program segment in figure 7.

```
</label>
<div className="col-sm-9">
<input
type="number" className="form-control" id="lama"
placeholder="Lama Pengerjaan"
value={lama} onChange={(e) =>
setLama(parseInt(e.target.value))} />
<div className="form-group row">
<label htmlFor="antrian" className="col-sm-3 col-
form-label">
Antrian Ke
</label>
<div className="col-sm-9">
<input
type="number"
className="form-control"  id="antrian"  placeholder="Antrian"  value={antrian}
onChange={(e) => setAntrian(parseInt(e.target.value))}/>
<button type="submit" className="btn btn-primary mr-2">
Tambahkan
</button>
```

Figure 7. The booking data input program segment

Testing

The test scenario for this final assignment is to access data and enter data into an application with a MySql database to determine the level of program effectiveness

[10]-[11]. This trial is divided into several parts, including admin login trial, adding admin login user data, updating admin login account, deleting admin login user data, entering booking data in the booking input menu, confirming booking data in the booking table, and viewing booking data via history.

To book a service, the admin fills in the booking data available on the booking input page, such as name, date, information, also cell phone number, processing time, queue number according to customer data, then press the add command until success appears as shown in Figure 8.

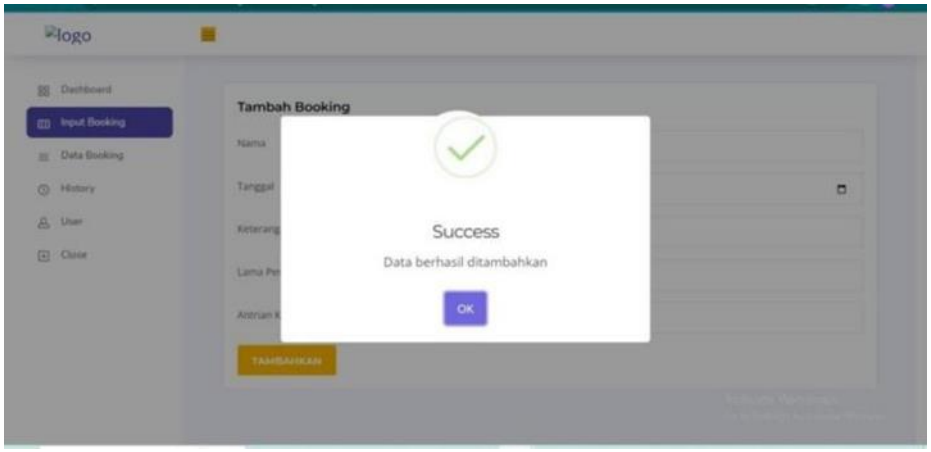

Figure 8. Booking data input trial

Next, if you have filled in the booking data, the admin will confirm by opening the booking data button and pressing the confirmation command. And finally, service booking data that has been confirmed or not yet confirmed can be seen through the history as in Figure 9.

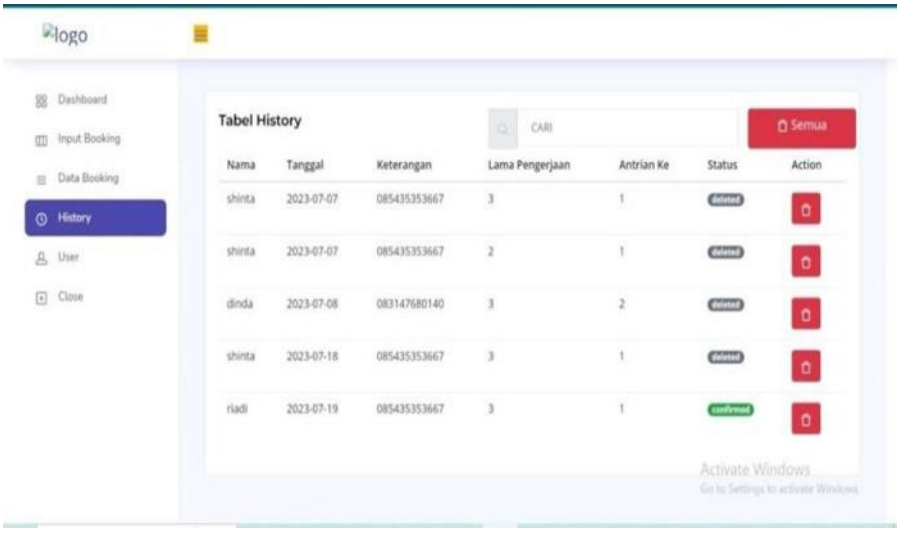

Figure 9. Viewing booking data through history

4. Conclusion

Based on the results of research that has been carried out on creating a website-based car service booking application at Bengkel Sinar Jaya, it can help customers make online bookings without having to come to the place. Before there was an application, customers had to come to the location to make a booking, so it took time to arrive at the location. So, with an online booking application you can save time in the service process and get a queue number online.

Data related to the website-based car service booking application process can be neatly arranged in a database to help the admin in processing the data and can be well organized. The process of processing car service booking data becomes more practical so that it can be processed correctly by the admin. By applying the research stages carried out in this research the author was able to create a system with a sequential and clear flow.

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