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Web-Based Futsal Field Reservation Application at Futsal NR Prabumulih

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Abstract

The development of digital technology encourages the sports sector to improve services. Futsal NR Prabumulih still uses a manual booking system that is less practical, especially in terms of time and access. This study aims to design a web-based futsal field booking application to make it easier for users to view schedules, book futsal fields, and make payments online. With a user-friendly interface, this application allows customers to make reservations at any time. In designing this system, UML (Unified Modeling Language) modeling tools such as use case diagrams, activity diagrams, and class diagrams are used to explain system functions, activity flows, and data structures. The system development method used is Rapid Application Development (RAD), which emphasizes the speed of development through iterative prototyping and active user involvement in every stage of development. Testing of the system shows an increase in efficiency in booking management and an increase in customer satisfaction. This application is expected to support modern and integrated services at Futsal NR Prabumulih.

Keywords: *Online Booking; Futsal Court; Web Application; Booking Management; Futsal NR Prabumulih*

1. Introduction

In today's era of digital transformation, information technology has become a crucial element in supporting various human activities. Various sectors, including sports, have begun adopting technology-based systems to improve services and meet consumer needs. Information technology can be defined as the study of the design, implementation, development, support, or management of computer-based information systems in hardware and software applications[1]. This is particularly relevant in the context of futsal, which is currently popular among various groups, especially in urban areas. NR Prabumulih Futsal is a popular sports facility, but the manual field reservation system presents various challenges. Reservations are an activity carried out by consumers before purchasing. To achieve customer satisfaction, companies must have a good reservation system[2]. The manual system often results in scheduling errors, delays in providing information to customers, and a lack of clarity regarding field availability. Furthermore, customers who wish to make reservations must come in person or contact the manager by phone, which may not always be available. As technology advances, the need for online booking systems is growing, particularly in the sports industry, which requires ease and speed in booking services. With a web-based booking application, customers can independently book fields, view availability, and make payments online. Utilizing web-based technology, the booking process is simplified and practical. Customers can book online, view available field schedules, and make payments quickly and easily. This web-based system also allows managers to manage booking data in a more structured manner, reducing the risk of errors and improving the quality of customer service. Considering the existing problems, designing a web-based futsal field booking application is the right solution to improve the speed and quality of service at Futsal NR Prabumulih. This application is expected to simplify customer bookings and payments, as well as assist managers in managing data in a more structured and accurate manner. This research aims to design a web-based booking system that can overcome the constraints of conventional systems and provide benefits for both customers and managers. In addition, this application is also expected to assist managers in monitoring operations in a more precise manner. This research is expected to be the first step in utilizing information technology to improve the competitiveness and quality of service at Futsal NR Prabumulih.

2. Theoretical Basis

2.1. Definition of Application

An application is a device (software) or computer program that operates on a specific system and is created and developed to carry out specific commands[3]. An application is a program on a computer or mobile phone that is used to run a previously created program[4].

2.2. Definition of Reservation
A reservation is an agreement made by two or more parties, namely the provider and the user of services and/or goods, to fulfill their needs so that they can be used[5]. A reservation is an agreement between two or more parties, namely the provider of goods or services and the user[6]."

2.3. Definition of Futsal
Futsal is a ball game played by two teams, each consisting of five players. The goal is to score goals by manipulating the ball with the feet[7]. Futsal is a modified version of soccer, with the same goal: to score points by scoring goals by scoring goals in the opponent's goal. The priority in futsal is good technique and skill so that players have the ability to play optimally[8].

2.4. Definition of Web
A website is a collection of several pages of information consisting of pages, text components, images, sound, and animation, thus becoming an information medium that can be accessed in various places[9]. A website is a medium that has many interconnected pages (hyperlinks), where the website has the function of providing information in the form of text, images, video, sound, and animation, or a combination of all of them[10].

2.5. Definition of the RAD Method
To solve problems and simplify the design process, the author uses the Rapid Application Development (RAD) model. Rapid Application Development (RAD) is a software development method that uses a combination of prototype and iterative models. A prototype is a model that is functionally equivalent to a product component[11].

3. Research Methods
3.1. Data Sources
a. Internal
   Internal data was taken from information within the organization being studied, namely NR Futsal Prabumulih. This data includes transaction records, operational documents, and administrative data used to support the research.
b. Exsternal
   External data is obtained from other parties or sources outside the organization, such as reference books, scientific journals, previous research reports, and articles that are relevant to the topic of web-based information systems or ordering applications.

3.2. Data Collection
Data collection was conducted to obtain the information needed to achieve the research objectives. The data collected by the author in this study used the following methods:
a. Observation
   Observation involves collecting research data directly at the research location and taking notes related to the issues being discussed.
b. Interviews
   This study conducted a Q&A session with the NR Futsal Prabumulih administrator to provide information related to the problem.
c. Literature Review
   Literature review is a data collection technique that uses books, e-books, journals, and previous research related to the research being conducted, including the subject matter and methods used.

3.3. System Development Methods
In the Rapid Application Development (RAD) model, functional modules are developed in parallel as prototypes and integrated to create a complete product and accelerate product delivery. Because there are no detailed planning details, changes are easy to make as the system develops. The RAD model distributes the analysis, design, manufacturing, and testing phases across a series of short, concise development cycles.

Fig. 1: RAD Model Stages

The following is an explanation of the stages of Rapid Application Development (RAD):

a. This stage of the requirements/needs planning process is crucial because it requires involvement from both parties: the prospective user and the analyst. The prospective user and analyst meet to discuss the system and information requirements to achieve the desired goals.
b. The system design process/design workshop involves actively engaging prospective users in confirming and improving the design's suitability between the prospective user and the analyst. A prospective user can provide input and comments on any design inconsistencies and design the system based on the system requirements established in the previous stage. The output of this stage is a system specification, which includes the general system organization, data structure, and other details.
c. The implementation process is the process of developing an application by implementing everything agreed upon based on the system's requirements and design. Testing is then performed to verify and verify that the application meets its requirements. If so, the application can be used as intended. If deficiencies remain, evaluation and improvements are made until the application truly performs as intended.

4. Systems Analysis and Design

4.1. Proposed Class Diagram

Based on the proposed use case and activity diagram, the class diagram for designing a web-based field booking application for futsal at NR Prabumulih is as follows:

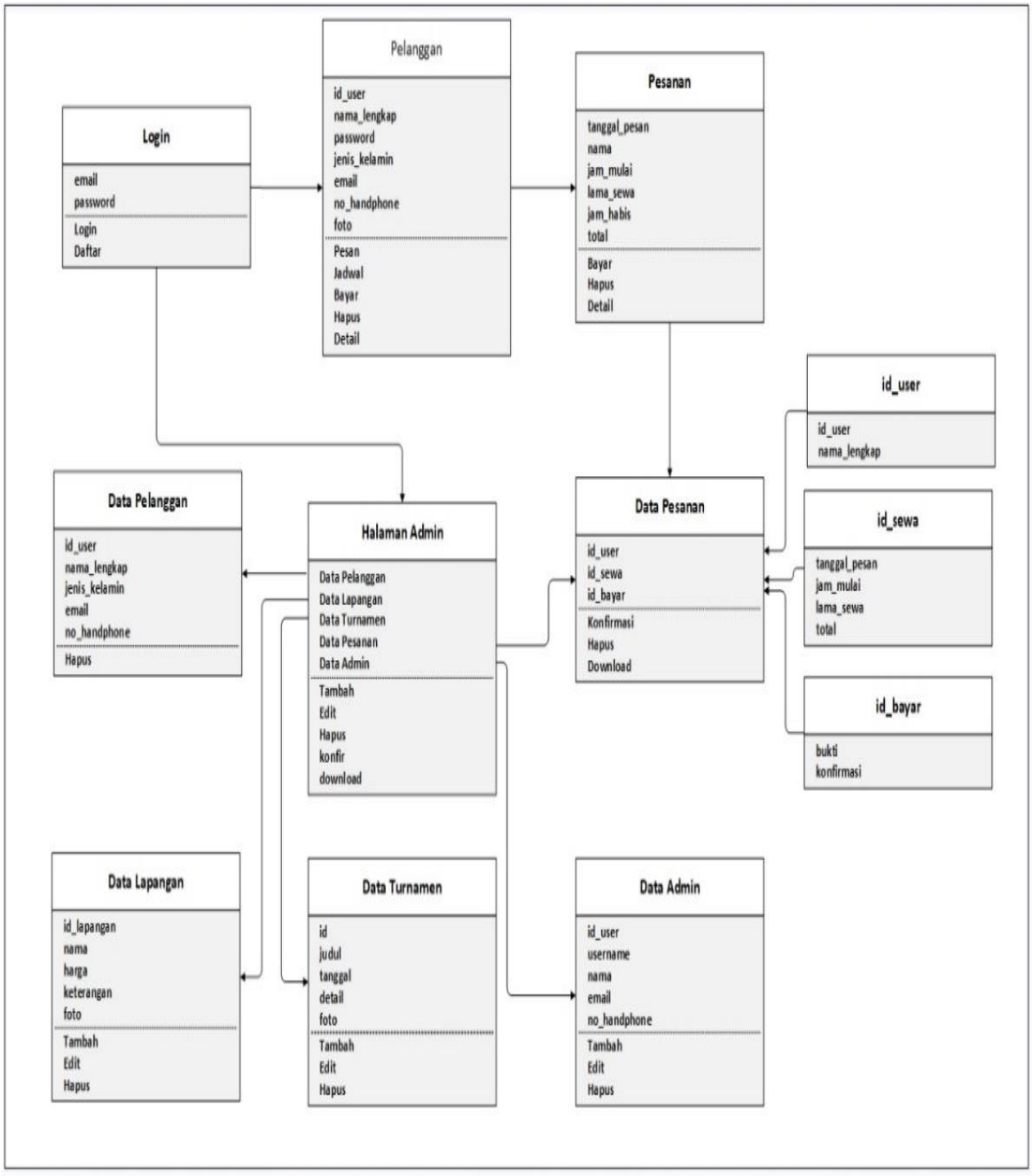

Fig. 2: Proposed Class Diagram

This image shows a class diagram that illustrates the data structure in the futsal field reservation system. There are several main classes, namely Customer, Admin, Field, Tournament, and Order. The User class stores customer information such as name, email, username, and password. The Admin class stores admin data who manages the system. The Field class stores field data such as field name, price, photo, and description. The Tournament class stores tournament data such as tournament name, date, photo, and details. The Order class functions to store order data from customers, such as customer name, order date, field, start time, duration of play, total, and proof, which is useful

for storing payment data along with proof of transfer from customers. All these classes are interconnected so that the system can run smoothly and facilitate the data management process.

5. Implementation and Testing

5.1. Interface Implementation

The user interface represents the designed software system. The following are the user interfaces of the web-based futsal field reservation application at Futsal NR Prabumulih:

a. Login view
The screen below shows the initial page when a user logs in. After successfully logging in, the user will be directed to the main menu based on their role. The following image shows the login page interface.

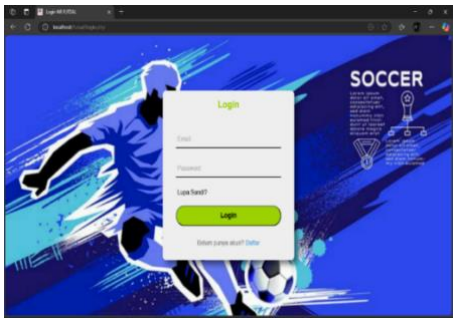

Fig. 3: Login Display Page

b. Registration page
If you don't have an account yet, you can register by clicking "Register." Then, enter your name, email address, password, address, gender, and photo. Once you've completed the information, click the "Register" button and you'll be returned to the login page.

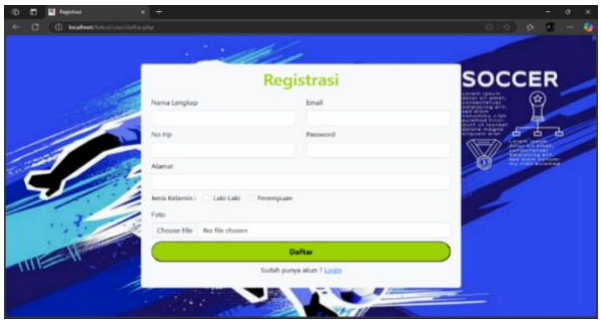

Fig. 4: Registration Display Page

c. Main display page
The main display contains general information about Futsal NR Prabumulih, such as available fields, reservations, and navigation buttons to other pages.

Fig. 5: Main Display Page

d. Field view page
Contains a list of available futsal fields, including field names, descriptions, and images. Customers can also view field availability schedules and make reservations by entering the date and time of play.

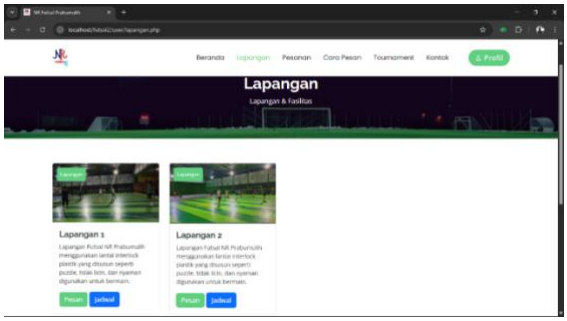

Fig. 6: Field View Page

e. Reservation page interface
After selecting a field and filling in the order details, customers are directed to this page to make payment. Proof of payment must be uploaded to this page as a requirement for order confirmation. If the admin cancels the order confirmation, a "cancel" button will appear.

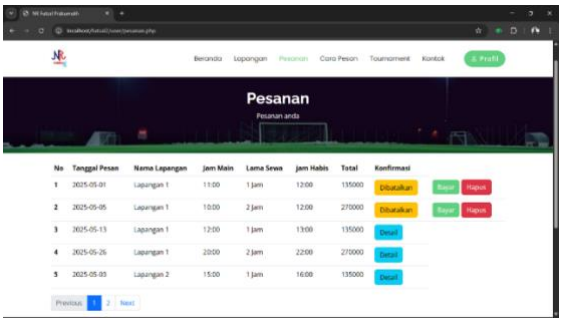

Fig. 7: Reservation Page Interface

f. Admin hompage view
Admin homepage view, which is the initial admin view after logging in.

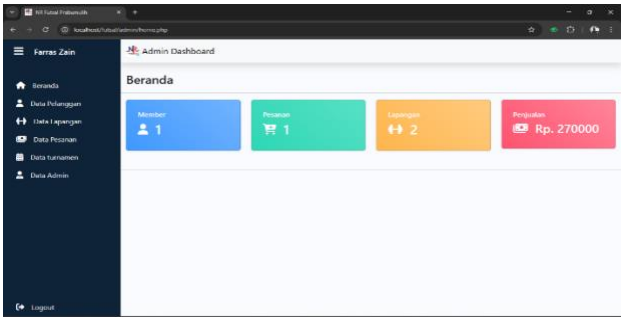

Fig. 8: Admin Homepage View

g. Reservation data page interface
This view displays all order details from customers. Admins can view order details. Admins also have access to confirm orders, change order statuses, or delete data if errors are detected. If an admin cancels a confirmation, the action will change to cancel.

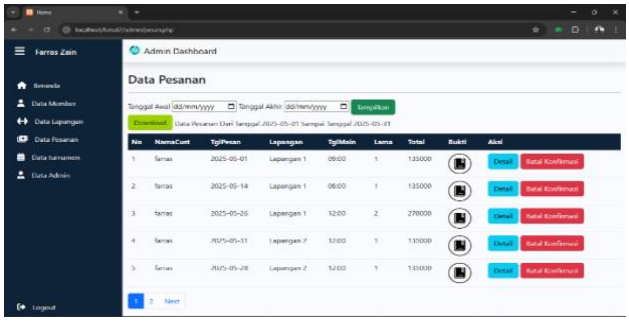

Fig. 9: Reservation Data Page Interface

h. Reservation Data Report Page Interface
This interface is used to view all reservations made by customers.

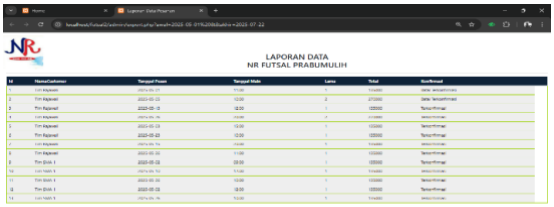

Fig. 10: Reservation Data Report Page Interface

5.2. System Testing

System testing is the final stage before the system is introduced to customers who act as users in this system using the Rapid Application Development (RAD) system development method. System testing can also be referred to as the execution of a software system to determine whether the software system runs according to specifications in the desired environment or not. In this study, the system testing method used is the black-box method. In this black-box system testing method, errors are found in existing menu functions, program imperfections, and errors that cause failure in the software system execution.

Table. 1: Black Box Testing

No	Test Item	Test Detail	Test Type	Conclusion
1	Customer registration	Registration Data Verification	Black-Box	Successful
2	*Login*	Login Data Verification	Black-Box	Successful
3	Futsal Field Reservations	Filling in Reservation Data	Black-Box	Successful
4	Reservation Payment	Upload Proof of Payment	Black-Box	Successful
5	Admin Data Management	Add, Edit, Delete Data	Black-Box	Successful
6	Customer Data Management	Deleting Customer Data	Black-Box	Successful
7	Field Data Management	Add, Edit, Delete Data	Black-Box	Successful
8	Tournament Data Management	Add, Edit, Delete Data	Black-Box	Successful
9	Reservation Data Management	Confirm Reservation Data	Black-Box	Successful
10	Reservation Data Report Management	Download Reservation Data	Black-Box	Successful

6. Conclusion

Several conclusions can be drawn from this research on the web-based futsal field reservation application at Futsal NR Prabumulih. The main problem identified is that the reservation system at Futsal NR Prabumulih is still done via WhatsApp or by visiting the location in person, resulting in difficulties in recording schedules, delays in information delivery, and limited payment methods, which can only be made in person. To address these problems, a web-based futsal field reservation system was designed using a descriptive qualitative approach and the Rapid Application Development (RAD) method. The system was modeled using UML class diagrams and developed with the PHP programming language and MySQL database to meet user needs and ensure ease of implementation. The designed application allows customers to view field schedules online, register, make reservations, and upload proof of payment without having to visit the location. Meanwhile, administrators are provided with features to comprehensively manage customer data, field data, tournament data, reservation data, and admin accounts. Thus, this system makes a positive contribution by improving services and managing futsal field reservation information in a digital and structured manner, while also being an effective solution in supporting Futsal NR Prabumulih's operations.

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