

Design of a Website-Based Field Rental Information System for Rajawali Futsal

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Abstract

This study aims to design and develop a field rental information system for Rajawali Futsal, which has been relying on manual methods for administration and data recording. The manual method often leads to data management errors and inefficiencies in customer service. One of the main issues identified is the inconvenience for customers who need to visit the location in person to make a reservation, which causes time constraints and discomfort. Additionally, the manual handling of financial reports makes it difficult for the management to obtain accurate and timely reports.

To address these issues, this study adopts the Waterfall system design methodology, which includes the stages of requirements analysis, system design, implementation, and testing. The system designed in this research aims to improve the efficiency and accuracy of the field rental process and data management. With the website-based system, customers can make field reservations online, choose available times and fields, and make payments without having to visit the location. Additionally, the system includes a financial reporting feature that allows the management to monitor and evaluate transactions in real-time and in a more structured manner.

The results of this study show that the implementation of a website-based information system can improve the ease of field rental processes, reduce data recording errors, and speed up the management of financial data. With this integrated system, it is expected that customer satisfaction will increase and the operational management of Rajawali Futsal will become more efficient and effective.

Keywords: Rental, Design, Futsal Field, Information System, Website.

1. Introduction

The rapid advancement of information technology in this digital era has significantly impacted various aspects of life, including business. It is undeniable that information technology has become an essential need, especially in supporting the smooth and efficient operations of various sectors. One of the key technologies in data management is computers, which enable companies to manage and access data quickly and accurately [1]. In addition, the advent of the internet and the development of smartphones have made websites an incredibly effective platform for businesses to reach a broader audience. Websites facilitate interactions between companies and customers in a manner that is easy, efficient, and accessible at any time and from anywhere [2].

Futsal, a sport increasingly popular among the public, presents a significant business opportunity in the field of field rentals. Futsal has become a widely enjoyed activity, both for recreation and as a means of maintaining physical health [3]. This growing demand opens up opportunities for many business owners to provide futsal facilities that the public can rent. However, despite the rapid growth of futsal field rental businesses, many field rental venues still use manual methods for managing rental administration. One such case is Rajawali Futsal, which still relies on traditional methods of recording bookings. This creates difficulties for customers, as they are required to visit the location in person to make a reservation, resulting in wasted time, energy, and costs. Additionally, manual booking records often lead to errors in both reservations and financial reporting [4]. These challenges highlight the need for a web-based field rental information system that would simplify the booking process for customers [5]. This system would not only provide convenience for customers to select the time and field they desire without visiting the location but also minimize errors in data recording and management. With the implementation of this system, it is hoped that the futsal field rental process at Rajawali Futsal will become more efficient and accurate, ultimately enhancing customer satisfaction. This study aims to design a web-based field rental information system at Rajawali Futsal to address the existing issues and improve the operational efficiency of the futsal field rental business in Adiwerna Singkil [6].

Based on the background described above, the problem formulation for this research is as follows: how to analyze the field rental information system at Rajawali Futsal, which still uses manual methods; how to design a field rental information system that can help customers select a field and time that suits their preferences without visiting the futsal center in person; and how to improve the efficiency of record-keeping that currently uses paper-based methods, leading to frequent errors. This research will focus on the design of a web-based field rental information system that simplifies the process for customers at Rajawali Futsal and addresses issues related to manual booking records and data management. The research will not address aspects unrelated to the design of the field rental system.

The goal of this research is to produce a design for a web-based field rental information system at Rajawali Futsal that improves the efficiency and accuracy of the reservation and data management process [7]. The benefits of this research can be categorized into several aspects: first, the benefit to scientific knowledge, as it contributes to the development of information systems for futsal field rental businesses and serves as a reference for future research in similar fields. Second, the benefit to the institution, as it can enhance the quality of futsal field rental services, making them more efficient and accurate while providing complete and easily accessible information about field rentals through an online platform. Third, the benefit to students, as it broadens their understanding of the application of information technology in business, hones their skills in designing web-based information systems, and enhances their creative thinking and time management capabilities [8].

2. Research Methodology

The research methodology used in this study aims to collect accurate and relevant data to design an information system for field rental at Rajawali Futsal. Several data collection methods are employed in this study, including observation, interviews, and literature review. The observation method involves the researcher directly observing activities at the field, specifically related to the process of field rental. The researcher examines the procedures in place for scheduling, selecting fields, and making payments at Rajawali Futsal. This observation provides a comprehensive understanding of the existing system and serves as a foundation for designing a more efficient new system. In addition to observation, the interview method is also used to obtain further information. The interview was conducted with Mr. Eko Supriyanto, the Head of Operations at Rajawali Futsal, who is responsible for the operational management of the futsal facility. Through this interview, the researcher gathered information regarding the history of Rajawali Futsal, its organizational structure, and the business processes, particularly related to field rental. This interview provided valuable insights into the operational aspects of the facility, which are essential for designing an effective system. Literature review also plays a crucial role in data collection. The researcher conducted a review of various books, journals, and online sources such as Google and social media to gather insights into theories and best practices related to information systems management that are relevant to the research topic. Through this literature review, the researcher enriched their understanding of concepts and approaches that could be applied in designing the field rental information system.

In the data analysis, this research follows four stages [9]. The first stage is a survey of the existing system at Rajawali Futsal, which involves direct observation and interviews. The second stage involves analyzing the data obtained from the survey to identify shortcomings or issues in the current system. This analysis is crucial for identifying areas that need improvement or enhancement in the existing system. The third stage is identifying the information needs, which involves recognizing information gaps in the current system, from the registration process to financial reporting. This identification of information needs will guide the design of the new system. The final stage is identifying system requirements, which aims to determine the ideal system for field rental at Rajawali Futsal. This stage is critical for ensuring that the new system meets the needs of the business and addresses any issues identified in the previous stages. The design method used in this research is UML (Unified Modeling Language), which includes several steps. These steps involve creating Use Case Diagrams to represent the system's functionality, Activity Diagrams to illustrate the process flow within the system, Sequence Diagrams to depict interactions between objects in the system, and Class Diagrams to illustrate the structure of the classes within the system to be developed. This approach is expected to result in a clear and structured system design, aligned with the needs identified in the previous stages, and ultimately aimed at improving the efficiency and effectiveness of the field rental process at Rajawali Futsal [10].

3. Result and Discussion

This study analyzes the futsal field rental system at Rajawali Futsal with the aim of identifying weaknesses in the existing system and designing a more effective and efficient information system. Based on the observations and interviews conducted, it was found that the current rental system still relies on manual record-keeping, both for field reservations and payments. This process involves two main parties, the admin and the customer, who interact directly. Every rental transaction is recorded in a Booking Book, a manual document used to note the time, place, and schedule of field rentals. Although this book serves as a reference, data loss or recording errors often occur, hindering the smooth process of field rental.

The manual recording in the Booking Book has several drawbacks, particularly related to the unpredictable frequency and volume of transactions. This book must be printed in duplicate, with one copy given to the customer and the other retained by the admin as an archive. Although this system has been in use for some time, its main weakness lies in the potential for data loss or writing errors, which are often caused by customer delays or discrepancies with the requested schedule. Therefore, to improve the quality of data recording and reduce the possibility of errors, a more automated system is required that can integrate the recording process in real-time.

In addition to the Booking Book, the futsal field rental system also relies on inputs provided by customers. The booking process is carried out through verbal communication, where the customer provides information about the desired schedule, which is then recorded by the admin. This requires great care and attention from the admin in entering the data, as any errors in recording the schedule can result in timing mistakes and mismatches between the customer's request and the available field. In some cases, customer delays or last-minute schedule changes can lead to errors in the recording system that affect the operational flow.

This manual recording process also reveals problems in managing the flow of information within the system. From the observation of the existing procedure, it is evident that the flow of information still heavily depends on direct interaction between the admin and the customer. The procedure begins with the customer visiting the futsal location to check field availability, followed by making a reservation if the field is available, paying the booking fee, and then playing futsal. After the game, the customer settles the remaining payment with the admin. If the field is unavailable, the customer simply leaves without further transaction. Although simple, this flow is still very manual and vulnerable to errors that can occur at any point, whether due to human mistakes or system limitations. Based on the analysis results, it is necessary to identify better information requirements to replace the current manual process. This involves a deeper understanding of the information flow between the admin and customers, as well as how the data is recorded, processed, and stored. Currently, the data entered by the admin is only available in physical format, making it difficult to access and manage. Therefore, a digital-based information system is essential to replace this manual recording method. With an integrated system, the admin can easily manage rental data, reduce errors, and speed up decision-making.

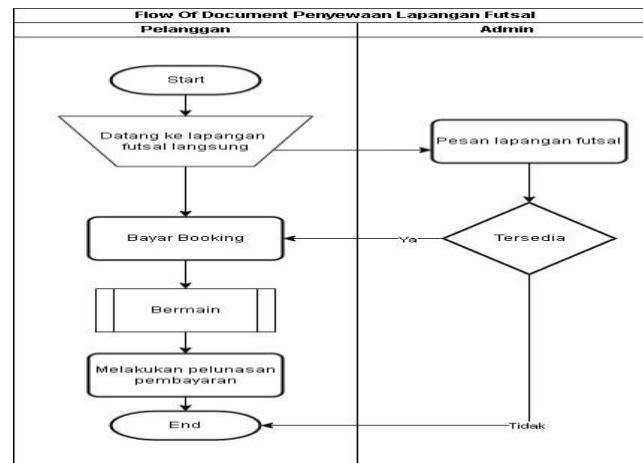


Fig. 1: Flow of Document for Field Rental System at Rajawali Futsal

In this context, the futsal field rental document flow, depicted in Figure 1 Flow Of Document For Futsal Field Rental, shows that the interaction between the admin and the customer heavily relies on direct communication. The diagram illustrates the steps taken, starting from the customer checking the availability of the field, making a reservation, paying the booking fee, playing futsal, and settling the remaining payment. This flowchart illustrates the importance of each step in the process and how every piece of information generated must be recorded accurately to ensure smooth operations. However, there is room for improvement in terms of managing the information flow and digitizing the process.

Considering the results of this analysis, it is recommended to develop a more sophisticated system that can not only simplify the recording and management of data but also provide structured and accurate reports and information. Implementing a digital system will enhance efficiency, reduce recording errors, and provide easier access for both the admin and customers. Additionally, the new system is expected to reduce reliance on physical records, which can minimize the risk of data loss and improve the quality of service at Rajawali Futsal.

3.1. Usecase Diagram

In this study, one of the aspects analyzed is the process of field rental at Rajawali Futsal, which can be illustrated through a Use Case Diagram to visualize the interaction between actors and the system. Figure 2 presents the **Use Case for Field Rental at Rajawali Futsal**, which involves two primary actors: customers and administrators. Customers have several capabilities that allow them to interact with the system. First, customers can view the availability of fields, enabling them to check if the desired field is available at a specific time. Next, customers can rent a field, which involves selecting the time and field, as well as completing the necessary payment process to finalize the transaction. Additionally, customers can view their rental history, which allows them to track their previous field usage.

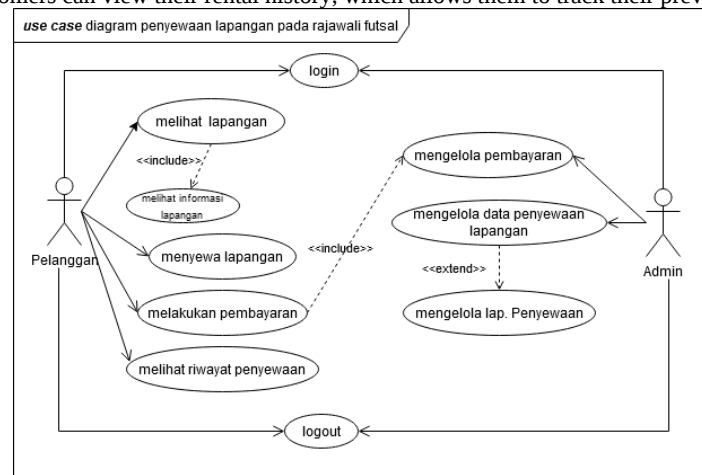


Fig. 2: Usecase Diagram of Field Rental System at Rajawali Futsal

Meanwhile, administrators have a more complex role in the field rental system. Administrators are responsible for managing payments received from customers, including verifying the payments made and ensuring that all transactions are recorded correctly. Additionally, administrators have the task of managing field rental data, which includes recording rental schedules, updating field availability status, and storing data related to rental transactions. Administrators must ensure that the data entered into the system is accurate and up-to-date so that the field rental operations run smoothly and without interruptions.

This Use Case Diagram clearly illustrates the roles played by each actor in the system. The interaction between customers and administrators in this system is crucial because every step, from booking a field to making a payment, involves managing data that must be accurately recorded and processed efficiently. Therefore, the development of a digital-based information system that automates much of this process will improve efficiency and reduce the potential for errors that may occur in manual processes. This system not only accelerates transaction processes but also simplifies data management and reporting, which in turn enhances the quality of service provided to customers.

Overall, the **Use Case for Field Rental at Rajawali Futsal** diagram provides a comprehensive overview of how the system operates and how the involved actors interact with each other. By understanding each function within the system, both from the customer and

administrator perspectives, we can design a better and more efficient information system. Ultimately, this will improve the operational performance of Rajawali Futsal and facilitate the overall management of field rentals.

3.2. Class Diagram

In the process of designing an information system for Rajawali Futsal, the Class Diagram plays a pivotal role in depicting the system's structure. This diagram visually represents the various classes involved in the system and their interactions, which is essential for organizing and structuring the system's functionalities. By outlining the attributes and methods of each class, the Class Diagram helps define the relationships between different components of the futsal field rental system. Through this, the diagram provides a comprehensive view of how data flows and how various system components communicate with each other.

The Class Diagram for Rajawali Futsal's field rental system consists of several core classes that play a crucial role in its operation. These classes include the Customer, Admin, Rental, Payment, and Field classes. Each class is responsible for specific data and functionality within the system. For example, the Customer class manages personal data such as the customer's name, contact details, and rental history. It also serves as the entity that initiates the rental process, requesting field bookings and making payments.

The Admin class is responsible for managing and overseeing the system. This class handles the data related to customer profiles, field rentals, and payments. It plays an essential role in ensuring smooth operations by validating payments, confirming bookings, and maintaining the overall system's integrity. Additionally, the Admin class is tasked with managing the availability of the futsal fields, ensuring that the customers' requests align with the available resources.

The Rental class records each transaction related to the field rental process. This class captures the rental details such as the field being rented, the rental duration, and the time of the rental. It is responsible for linking the customer with the field they have booked and ensures that rental information is stored accurately in the system. The Rental class, therefore, forms the backbone of the rental process by keeping track of bookings and maintaining accurate records of customer interactions with the system.

Another important class is the Payment class, which tracks all financial transactions made by customers. This class records details about payment methods, amounts paid, payment status, and the link between the payment and the corresponding rental transaction. The Payment class ensures that customers' payments are properly processed and associated with the correct rental records, thereby facilitating smooth financial operations within the system.

The Field class is central to the system's operation as it stores information about the futsal fields available for rent. This class tracks the specific fields, their capacities, and their availability. The Field class helps the system manage the resources effectively by providing up-to-date information on which fields are available for rent at any given time. This ensures that customers are able to book fields according to their preferences, without conflicts regarding field availability.

These classes are interconnected, and their relationships are critical to the effective functioning of the futsal field rental system. The associations and interactions between the classes ensure that the system operates efficiently by facilitating accurate data flow and seamless coordination between different parts of the system. By providing a structured overview of how the system components interact, the Class Diagram serves as a valuable tool for the development team, guiding them through the implementation of the proposed information system. In conclusion, the Class Diagram provides an essential framework for developing the futsal field rental system at Rajawali Futsal. It enables the system developers to visualize the interrelations among the core components, ensuring that each class fulfills its role in the system effectively. This structured approach to system design will lead to the creation of a well-organized, efficient, and functional system that meets the needs of both customers and administrators. With this Class Diagram, the development process can proceed with clarity, minimizing errors and improving overall system performance.

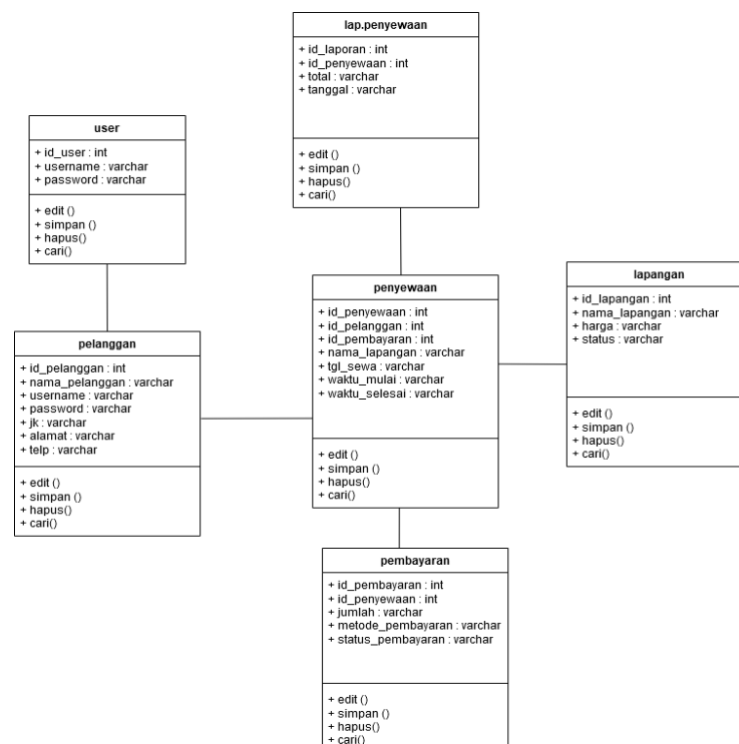


Fig. 3: Class Diagram of the Field Rental System at Rajawali Futsal

4. Conclusion

The current field rental information system at Rajawali Futsal still uses conventional methods, relying on manual record-keeping with paper-based media. Although this system has been in place for a considerable period, it presents significant issues. One of the main problems is errors in recording rental data, which can occur due to reliance on manual input, affecting the accuracy and speed of the rental process. Additionally, the time required for the rental process is quite long, especially when many customers arrive simultaneously. This affects customer satisfaction and hampers operational efficiency.

This study successfully analyzed and designed a website-based field rental information system that addresses the existing problems. Using the Waterfall methodology for system design, this research follows a structured process, including needs analysis, system design, and the implementation of the proposed solution. In the needs analysis phase, various important aspects of field rental, such as data flow, required functionalities for customers and admins, and financial management, were studied in depth.

The results of this research show that the implementation of the website-based information system provides ease for customers to make field rentals online. Customers can now book a field according to real-time availability, make digital payments, and view their rental history. This system also facilitates better data management, reduces the possibility of data entry errors, and speeds up the rental process, thus improving customer satisfaction.

Moreover, this new system improves the efficiency of data and financial report management. With the integrated system, the admin can easily manage rental data, confirm payments, and generate accurate financial reports automatically. This accelerates administrative processes and minimizes the manual workload, which was previously a major obstacle in managing field rentals.

The implementation of this information system is expected to have a positive impact on Rajawali Futsal, both in terms of customer satisfaction and operational efficiency. With a more modern and automated system, Rajawali Futsal will be able to handle higher rental volumes without compromising service quality. Furthermore, this report also provides a reference for the development of similar information systems elsewhere, particularly for those seeking to implement technological solutions to address similar challenges.

Overall, this research successfully designed and implemented an information system for field rentals that meets the needs of Rajawali Futsal. It is expected that with this information system, Rajawali Futsal can continue to develop and improve its services, becoming more competitive in an increasingly fast-paced industry. Therefore, the development of this system not only provides short-term benefits but also opens up opportunities for long-term growth in improving operational quality and customer service.

In conclusion, the website-based field rental information system developed from this research not only provides a solution to existing problems but also introduces a new approach to more efficient and effective business management. In the future, the adoption of such technology-based information systems is expected to be adopted by more small and medium enterprises, particularly in the entertainment and sports sectors, to enhance competitiveness and service delivery to the public.

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