Application of SAAS (Software as A Service) in Billiard Reservations for Billiard Business Actors in Kudus Regency Based on Web

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ABSTRACT

In the digital era, the use of information technology is increasingly important to improve business efficiency. This study focuses on the application of the SaaS concept in the development of a web-based billiard reservation system. The aim is to overcome problems often faced by billiard business actors, such as difficulties in managing booking schedules, errors in data recording, and lack of real-time information for customers. The system developed is expected to provide effective and efficient solutions, so that it can improve the quality of service and competitiveness of billiard businesses in Kudus Regency.

1. INTRODUCTION

1.1 BACKGROUND

The rapid development of information technology has significantly changed the business landscape. One innovation that has had a major impact is the emergence of a cloud-based software service model, one of which is Software as a Service (SaaS). SaaS allows users to access and utilize software applications via the internet without having to install the software locally. This provides high flexibility and efficiency for users, especially for business people. [1] [2] [3]

In the context of billiard business, the implementation of SaaS-based information systems can be an effective solution to improve operational efficiency. In Kudus Regency, billiard business has become one of the popular entertainment choices. However, many of these billiard businesses still rely on manual reservation systems. This manual system often causes various problems, such as recording errors, difficulty in managing schedules, and lack of real-time information. As a result, the quality of service provided to customers is less than optimal. [4] [5] [6]

To overcome these problems, a more modern and efficient reservation system is needed. A SaaS-based reservation system offers a number of advantages, including ease of access, flexibility, and scalability. By utilizing this system, billiard business actors can manage booking schedules more effectively, reduce human error, and provide more accurate information to customers. In addition, the SaaS system can also be integrated with various additional features, such as online payment systems, inventory management, and sales reports. [7] [8]

Based on the background above, this study aims to design and develop a SaaS-based billiard reservation system that can meet the needs of billiard business actors in Kudus Regency. The system developed is expected to improve operational efficiency, improve service quality, and provide a positive contribution to the development of billiard businesses in the region. [9], [10] [11]

1.2 FORMULATION OF THE PROBLEM

How the implementation of SaaS in a web-based billiard reservation system can improve the efficiency of reservation management for billiard business actors in Kudus Regency.

1.3 SCOPE OF PROBLEM

In this research, the author limits the problem or scope of the research to the following matters:
a. Website-based system with several actors: Billiard admin, customers, and system owner.
b. The system will manage data including: regional data, customer data, billiard business actor data.
c. The system will manage information and reports including: customer registration, customer reservations, and sharing business profits with business owners.
d. Use of Whatsapp API to provide information if there is a Billiard table reservation.
e. The system is developed with PHP programming language and manages the MySql database.

1.4 RESEARCH PURPOSES

a. Designing and developing a web-based billiard reservation system that utilizes SaaS technology to improve the efficiency of reservation management in billiard businesses in Kudus Regency.
b. Testing the feasibility and functionality of the reservation system that has been developed.

2. RESEARCH METHODOLOGY

2.1 METHOD OF COLLECTING DATA

Data collection aims to obtain accurate, relevant, valid and reliable data, so the author collects data sources in the following ways: [12]

2.1.1.   Primary Data Sources
Primary data is data obtained directly from the research site through observation and recording of the research object. Primary data sources include:

a.   Observation
Observation is a data collection technique by directly observing the activities in one of the wholesale admins in the company. Observation is carried out so that the author can know or can directly observe how the activities are in the field.

b.   Interview
In the process of information system development and development activities, identifying system needs is an activity of general analysis of the existing situation to be able to find real problems while at the same time connecting them with the causes of existing problems.

Interview technique is one of the most effective ways to obtain data. In the process of implementing a computerized information system, an interview technique with one of the wholesale admins was carried out to handle the existing problems.

2.1.2.   Secondary Data Sources
Secondary data sources are data sources obtained indirectly from the research object. These secondary data can be obtained from literature or books. Secondary data sources include:

a.   Documentation Study
Documentation studies are collected through literature and documentation from internet media or other information sources.

b.   Literature Study
This study was collected through books that are in accordance with the theme of the research problem.

2.2 SYSTEM DEVELOPMENT METHODS

The system development method is a method with an important process for creating a system. In the development that will be applied in this research is the waterfall method. Waterfall provides a sequential software lifecycle approach starting from analysis, design, coding, testing, and support stages. [13]

The stages of system development in the waterfall method include:

a.   Software Requirements Analysis
The process of gathering needs is done intensively to specify software needs so that it can be understood what kind of software is needed by the user. Software requirements specifications at this stage need to be documented.

b.   Software Design
Software design is a multi-step process that focuses on the design of software program creation including data structures, software architecture, interface representations, and coding procedures. This stage translates software requirements from the requirements

analysis stage into design representations so that they can be implemented into programs at a later stage. The software design produced at this stage also needs to be documented.

c.   Program Code Creation
The design must be translated into a software program. The result of this stage is a computer program according to the design that has been made in the design stage. In making the program code, the compiler uses PHP and Mysql as its database.

d.   Testing
Testing focuses only on the software in terms of logic and functionality, ensuring that all parts have been tested. This is done to minimize errors and ensure that the output produced is as desired.

e.   Supporters and Maintainersan
It is possible for a software to change when it has been sent to the user. Changes can occur because of errors that appear and are not detected during testing or the software must adapt to a new environment. The support or maintenance stage can reduce the development process from specification analysis to changes to existing software, but not to new software.

2.3 SYSTEM DESIGN METHODS

In the development of object-oriented programming techniques, a standardization of modeling languages for software development built using object-oriented programming techniques emerged, namely the Unified Modeling Language (UML). UML emerged because of the need for visual modeling to specify, describe, build, and document software systems. UML is a visual language for modeling and communicating about a system using diagrams and supporting texts. [4] The following are the types of Unified Modeling Language (UML) diagrams, including: [14]

a.   Use Case Diagram
Use Case Diagram is a modeling for the behavior of the information system to be created. Use case describes an interaction between one or more actors with the information system to be created. There are several actors in the system, namely verification officers, field officers and department heads. Use cases are used to find out what functions are in an information system and who has the right to use these functions.

b.   Class Diagram
Class diagrams describe the structure of a system in terms of defining the classes that will be created to build the system. Classes have what are called attributes and methods or operations.

c.   Sequence Diagram
Sequence diagrams describe the behavior of objects in a use case by describing the lifetime of the objects and the messages sent and received between objects. They graphically depict how objects interact with each other through messages in a sequence of use cases or operations.

d.   Activity Diagram
Activity diagram is a diagram that describes the workflow or work flow or activities or activities of a system or business process or menu in the software. What needs to be noted here is that the activity diagram describes the system's activities, not what the actor does, so the activities that can be done by the system only.

e.   Statechart Diagram

Statechart diagram or in Indonesian called machine diagram is used to describe the status change or transmission of a machine or object system. This diagram illustrates the life cycle of an object, various states that can be assumed by the object and the events that cause the object from one place to another.

3. RESULTS AND DISCUSSION

3.1. FOD (Flow Of Document)

Flow-Of-Document (FOD) refers to the flow or process by which documents move through various stages in a system or organization. This concept is important in document management and business processes to ensure that documents are managed efficiently, effectively, and in accordance with existing policies. The FOD formed during the analysis of the ongoing process is as follows can bee see in figure 1.
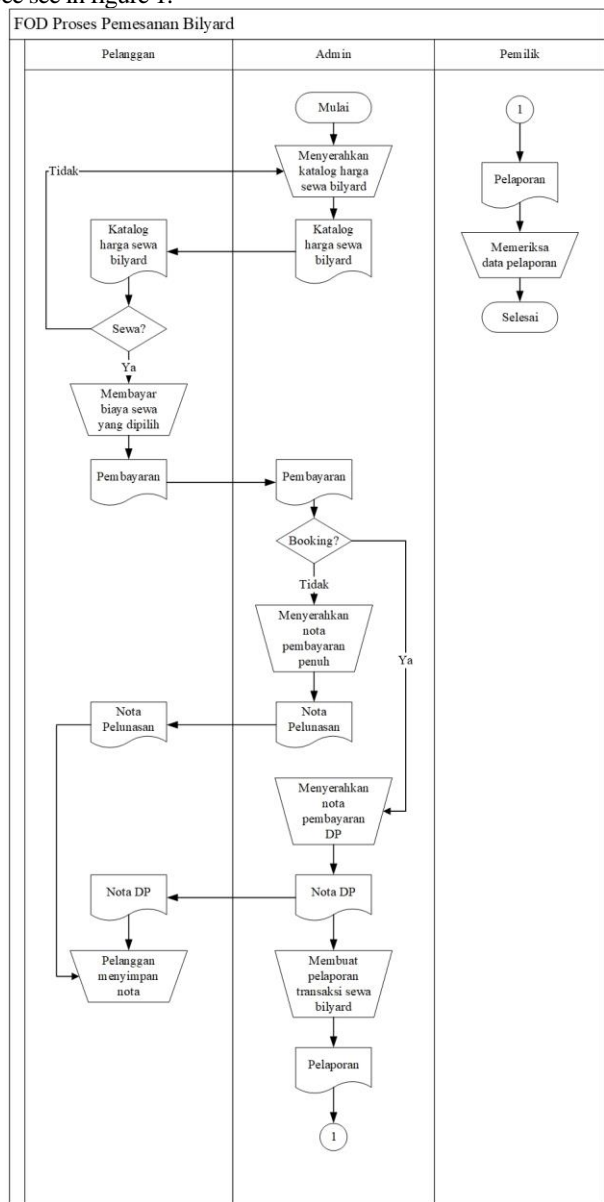

Figure 1. FOD (Flow Of Document)

3.2. SYSTEM USE CASE DIAGRAM

The use case system diagram is used to describe the interaction between actors and systems in order to achieve certain goals is shown in figure 2. The following is an explanation of the designed use case system diagram, The owner manages system user data. The owner manages area data. The owner manages customer data. The owner manages Billiard location data. The owner manages system revenue sharing data. The owner manages reporting checks. Admin manages Billiard location data. Admin manages Billiard rental transaction data. Admin manages customer payment data. Admin manages system revenue sharing data. Admin manages reporting recaps. Customers register customers. Customers make Billiard rental transactions. Customers make customer payments.

Figure 1. System Use Case Diagram

3.3. CLASS DIAGRAM

Class Diagram is a diagram used to show various classes in a system or software being developed. This diagram provides a comprehensive overview of the structure of the system or software and the relationships between existing classes [15]. The following are the stages in planning a Class Diagram is shown in figure 3.
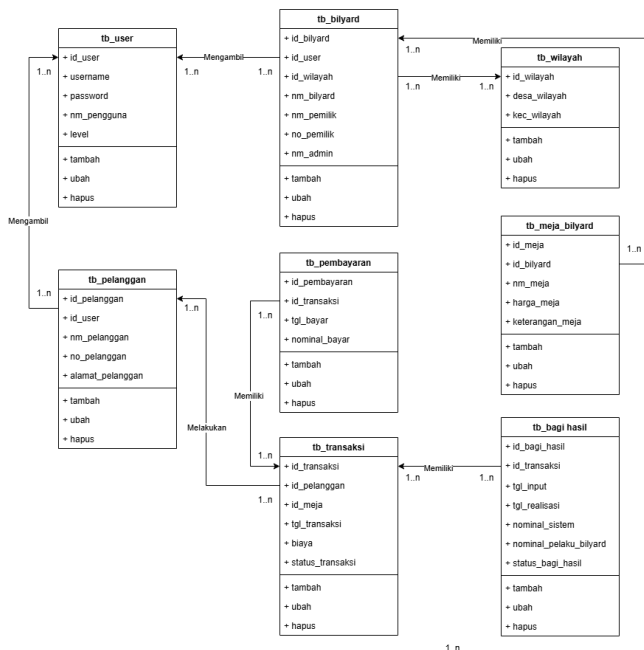
Figure 2. Class Diagram

3.4. ER DIAGRAM

ERD (Entity Relationship Diagram) is one of the important design tools used in designing business data structures. This diagram serves to describe the relationship or relationship between various entities or objects involved in the system, along with the attributes attached to each entity. By using ERD, we can visualize and understand how entities in the system relate to each other and interact with each other. This diagram helps in designing and documenting data structures in a clear and systematic manner.

The following is an ER-Diagram of the Implementation of SAAS (Software As A Service) on Billiard Reservations for Billiard Business Actors in Kudus Regency Based on the Web which is formed from several entities. The ER-Diagram can be seen in the figure 4.
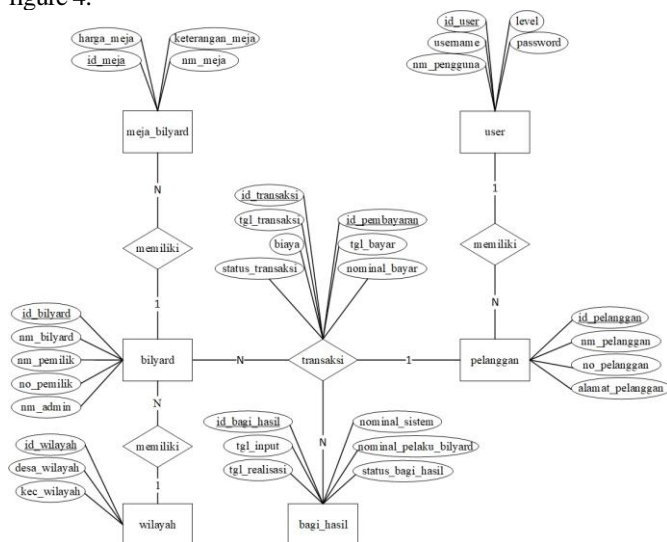

Figure 3. ER-Diagram

3.5. TABLE TRANSFORMATION

Table transformation from ER-Diagram (Entity-Relationship Diagram) is the process of converting the conceptual model depicted in the ER-Diagram into a table schema that can be used in a relational database system such as MySQL.

The following is a table transformation of the ER-Diagram formed for the Application of SAAS (Software As A Service) for Billiard Reservations for Billiard Business Actors in Kudus Regency Based on the Web.

user : {id_user, username, password, nm_user, level (admin, owner, customer)}

region : {id_region, village_region, sub_district_region}

customer : {customer_id, user_id, customer_nm, customer_no, customer_address}

Billiard : {id_Billiard, id_user, id_region, nm_Billiard, nm_owner, no_owner, nm_admin}

Billiard table : {table_id, Billiard_id, table_nm, table_price, table_description}

transaction : {transaction_id, customer_id, table_id, transaction_date, cost, transaction_status (booking, used, free)}

payment : {payment_id, transaction_id, payment_date, payment_amount}

profit sharing : {result_sharing_id, transaction_id, input_date, realization_date, system_nominal, billiard_actor_nominal, profit_sharing_status (submission, realization)}

3.6. DATABASE RELATIONS

Relationships in MySQL databases are relationships established between tables to ensure data integrity and query efficiency. Several tables are connected to each other by lines that indicate the relationships between the tables. Each table is represented by a box containing the table name and the columns it contains. Relationships between tables are depicted by lines or arrows that show how data in one table relates to data in another table.

The table relations formed in the database for the creation of the SAAS (Software As A Service) Application for Billiard Reservations for Billiard Business Actors in Kudus Regency Based on the Web is shown in figure 5.
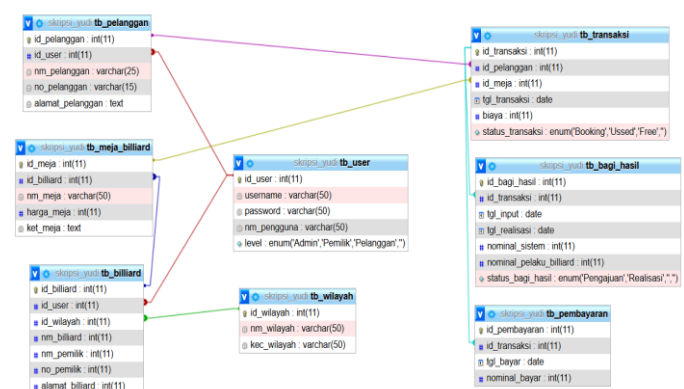

Figure 4. Database Relations

4. CONCLUSION

Based on the results and discussion of this study, it can be concluded that this study has succeeded in designing and developing an effective and efficient SaaS-based billiard reservation system for billiard business actors in Kudus Regency. The results of the study show that the implementation of this system can improve the efficiency of reservation management, reduce manual errors, and improve data accuracy. In addition, this system has also been proven to be able to increase customer satisfaction through features such as online ordering, automatic notifications, and real-time information. Thus, a SaaS-based reservation system can be the right solution to increase the competitiveness of billiard businesses in Kudus Regency.

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