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Application Of The RAD Method In The Bus Ticket Management And Sales Information System at PT. RAPI

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ABSTRACT *– PT. RAPI is a company engaged in land transportation services that provides intercity and interprovincial bus transportation. The management and ticket sales processes at PT. RAPI were previously carried out manually using ledger books, including the recording of passenger data and ticket transactions. This condition makes data management and reporting processes less structured. This research aims to develop a web-based bus ticket booking, sales, and management information system to support the administrative and ticket transaction processes at PT. RAPI. The system development method used in this research is Rapid Application Development (RAD), which emphasizes rapid development and user involvement during the system development process. The research uses a descriptive method with a qualitative approach, while system modeling uses Unified Modeling Language (UML) and system testing uses Black Box Testing. The resulting system provides several functions, including user registration and login, ticket booking, seat selection, booking history, payment confirmation and proof of payment upload, bus and route management, departure schedule management, offline ticket transactions, payment verification, and report generation. The implementation of these functions provides PT. RAPI with a computerized system for managing bus ticket booking, sales, and administrative data in an integrated manner.*

Keywords *- Information System; Bus Ticket; Ticket Booking; Rapid Application Development (RAD)*

Penerapan Metode RAD Pada Sistem Informasi Pengelolaan Dan Penjualan Tiket Bus Pada PT. RAPI

ABSTRAK *– PT. RAPI merupakan perusahaan yang bergerak di bidang jasa transportasi darat yang menyediakan layanan transportasi bus antar kota dan antar provinsi. Proses pengelolaan dan penjualan tiket pada PT. RAPI sebelumnya masih dilakukan secara manual menggunakan buku besar, termasuk pencatatan data penumpang dan transaksi tiket. Kondisi tersebut menyebabkan proses pengelolaan data dan pembuatan laporan belum terstruktur dengan baik. Penelitian ini bertujuan untuk mengembangkan sistem informasi pemesanan, penjualan, dan pengelolaan tiket bus berbasis web guna mendukung proses administrasi dan transaksi tiket pada PT. RAPI. Metode pengembangan sistem yang digunakan adalah Rapid Application Development (RAD), yang menekankan proses pengembangan secara cepat dengan melibatkan pengguna selama proses pengembangan sistem. Penelitian ini menggunakan metode deskriptif dengan pendekatan kualitatif, sedangkan pemodelan sistem menggunakan Unified Modeling Language (UML) dan pengujian sistem menggunakan Black Box Testing. Sistem yang dihasilkan menyediakan beberapa fungsi, meliputi registrasi dan login pengguna, pemesanan tiket, pemilihan kursi, riwayat pemesanan, konfirmasi pembayaran dan unggah bukti pembayaran, pengelolaan data bus dan rute, pengelolaan jadwal keberangkatan, transaksi tiket secara langsung, verifikasi pembayaran, serta pembuatan laporan. Implementasi fungsi tersebut menghasilkan sistem terkomputerisasi yang dapat digunakan PT. RAPI untuk mengelola proses pemesanan, penjualan, dan administrasi data tiket bus secara terintegrasi.*

Kata Kunci *– Sistem Informasi; Tiket Bus; Pemesanan Tiket; Rapid Application Development (RAD)*

1. INTRODUCTION

Buses are one of the many modes of transportation that play a vital role in human life by facilitating and simplifying daily activities. People use buses to travel from one place to another. Most people prefer to travel long distances by bus, a form of land transportation, rather than by car or motorcycle because it is more affordable and allows them to rest comfortably during the trip. [1]

PT. RAPI is a company engaged in the bus transportation industry and is located on Jenderal

Sudirman Street, Gunung Ibul Village, East Prabumulih Subdistrict, Prabumulih City, South Sumatra. PT. RAPI offers offline ticket purchases by visiting the bus ticket counter [2] A bus ticket is proof of a passenger's right to travel using a mode of transportation. However, the administrative process for managing and selling tickets at the ticket counter is still carried out manually, including recording passenger data and ticket sales in a ledger. Sales refer to activities in which sellers fulfill the needs and desires of buyers through the products or services offered [3] This manual approach often leads to time-consuming processes, increases the risk of recording errors, and complicates the preparation of sales reports. Furthermore, PT. RAPI does not yet have a computerized system to assist administrators in managing ticket sales data directly at the ticket counters.

As a technological solution, a computerized bus ticket management and sales information system has been developed. Management is a process or framework that involves guiding or directing a group of people toward organizational goals or concrete objectives, and it is also an activity in itself. [3]

With this system, administrative tasks can be carried out quickly, accurately, and in an integrated manner. This system can also help reduce errors in report generation, improve the quality of customer service, and make it easier for customers to purchase tickets online. An information system is a set of formal procedures through which data is collected and processed into information to support decision-making and control within an organization[4]

Several previous studies have discussed the development of bus ticket information systems, including bus ticket ordering and web-based ticket booking systems. However, the existing studies cited in this research have generally focused on specific aspects of ticket ordering or ticket data management. In contrast, the operational process at PT. RAPI requires a system that accommodates several related activities, including ticket booking, seat selection, payment verification, departure schedule management, offline ticket transactions, and sales report generation. Therefore, a research gap remains in the development of a bus ticket management system that integrates these operational activities according to the specific needs of PT. RAPI. The gap is not only related to the development of a web-based ticket system, but also to how the system can integrate the ticket management and sales processes required by the company into a single system.The Rapid Application Development (RAD) method is known as a system development approach that emphasizes the speed of the development process. Compared to conventional methods, which can take about six months or more, the use of RAD allows the system to be completed in about two to three months, making the development process more efficient [5]

By implementing the RAD method, the development of the bus ticket management and sales information system at PT. RAPI can be carried out more quickly, effectively, and efficiently. Through this method, administrators can be directly involved in determining the system's workflow, interface, and features, ensuring the final product better aligns with their needs. Therefore, this study focuses on the application of the RAD method to build a computerized information system that is user-friendly and capable of improving PT. RAPI's administrative performance.

The novelty of this research lies in the application of the RAD method to develop a web-based bus ticket management and sales information system specifically tailored to the operational requirements of PT. RAPI. The developed system integrates ticket booking, seat selection, payment verification, departure schedule management, offline ticket transactions, and report generation within a single system. Thus, this research does not merely focus on developing another bus ticket ordering system, but on integrating the specific ticket management and sales activities required by PT. RAPI through a RAD-based development approach. Therefore, this study focuses on applying the RAD method to develop a computerized information system that accommodates the operational requirements of PT. RAPI and supports the management of bus ticket data in an integrated manner.

2. LITERATURE REVIEW

The literature review not only covers theories related to information systems and the technologies used but also explains the research methodology that forms the basis for system development. This methodology includes software development methods, system modeling techniques, and testing methods used to ensure the system operates in accordance with user requirements.

A. Information Systems Theory and Bus Ticket Management

Application is the process of implementing a theory, method, or concept into a planned activity to achieve a specific goal In the development of this system, the Rapid Application Development (RAD) method, a software development method that emphasizes speed in the system development process. [6] An application can also be defined as software that operates on a specific system and is created and developed to carry out specific

commands from brainware. [7] explains that RAD is a combination of several structured methods or techniques that use a prototyping approach and other structured techniques to determine user requirements and carry out information system design. This method was applied in the development of an information system designed to support the management and sales of bus tickets [8] explain that an information system is a set of interconnected components that collect, process, store, and distribute information to support decision-making and monitoring. Thus, the application of the RAD method in this study serves as the foundation for building an information system that can be tailored to user needs and supports a more structured data management process.

Data management in this system relates to the processing of ticket data and sales activities.[9] explains that management is the science of managing and handling something to achieve specific objectives. In addition to management, the developed system also relates to the ticket sales process [3] explain that sales is an activity in which a seller fulfills the needs and desires of a buyer with the aim of providing sustainable benefits for both parties. Bus tickets are the primary objects managed within the developed system [10] explain that a ticket is a travel document issued by a company containing information regarding the route, date, price, and passenger data used for the journey. To support these management and sales processes, the information system in this study was built as a web-based system. [11] explain that the web is one of the main components of the internet that allows users to access, search for, and share various types of information, data, images, and other content through a web browser.

B. Technology Theory and Systems Development

In web-based system development, PHP is used as one of the programming languages responsible for processing data and generating user interfaces. [12] explain that PHP (Hypertext Preprocessor) is a server-side programming language used to develop dynamic and interactive web applications. PHP runs on a web server to process requests from clients via a browser and generate responses that are then displayed to users. To ensure that data processed by PHP can be properly stored and managed, a database is required as a medium for storing information within the system. One of the database management systems used is MySQL.[13] PHP, commonly known as the Hypertext Preprocessor, is an open-source server-side scripting language. As a scripting language, PHP executes programming instructions at runtime. The results of these instructions will naturally vary depending on the data being processed [14] explain that MySQL is a database management system that uses SQL to manage data; it is open-source and supports the PHP programming language. With PHP and MySQL, the system development process can be carried out by integrating data processing and data storage into a single, interconnected system.

Furthermore, in order for PHP and MySQL to be used and run simultaneously during the system development process, a local server environment that supports both is required. One software package that can be used is XAMPP. [15] explains that XAMPP is an Apache web server software package that includes a MySQL server and is supported by the PHP programming language for creating dynamic websites. Thus, XAMPP serves as a local server environment that enables the development and testing of web-based systems by integrating PHP as the programming language and MySQL as the database. The use of these three technologies is interrelated in supporting the development of web-based information systems capable of processing, storing, and displaying data according to user needs.

3. METHOD

Research methodology is a series of steps used to collect, process, and analyze data in order to achieve the research objectives. A research method is the set of procedures and frameworks used in research. Research methods enable research to be conducted in a planned, scientific, neutral, and meaningful manner [16]. In this study, the methodology employed includes system development using the RAD method, system modeling using UML (Use Case Diagram), and system testing using Black Box Testing. In this study, the author used a descriptive research method with a qualitative approach.

According to [17] descriptive research is the collection of data to test hypotheses or answer questions about the current status of the research subject; it is a factual research method that examines the current status of a group of people, an object, a condition, a system of thought, or an event, with accurate interpretation. Meanwhile, according to M. Fathun Niam et al. (2024:2), the qualitative research method is a research approach aimed at understanding and explaining the meaning of a phenomenon within its natural context. In qualitative research, researchers collect data in the form of text, images, sound, or other non-numerical data, which is then analyzed using an inductive approach.

state that the qualitative descriptive method is a method that portrays, describes, and presents the research subject as it is, based on the circumstances and conditions at the time the research was conducted [18].

A. Datenquelle

Data sources are an important part of research because it is from these data that researchers can obtain relevant information to answer the research question. In this study, the researcher used two data sources: primary data and secondary data

- Primary data is the main source of information collected directly by researchers during the research process. This data is obtained from original sources, namely respondents or informants related to the research variables. Primary data can take the form of observations, interviews, or data collected through questionnaires.[19]
- Secondary data is data obtained indirectly by the researcher, rather than from primary sources or the research subjects themselves. Secondary data serves to supplement primary data and is obtained through a literature review as a reference for the research being conducted, such as books, e-books, journals, previous studies, and articles.

B. Development Methodology

RAD (Rapid Application Development) is a software development method that emphasizes speed in the system development process by actively involving users through prototyping, iterative development, and feedback. With this approach, systems can be developed and tailored to user needs in a relatively short period of time [20].

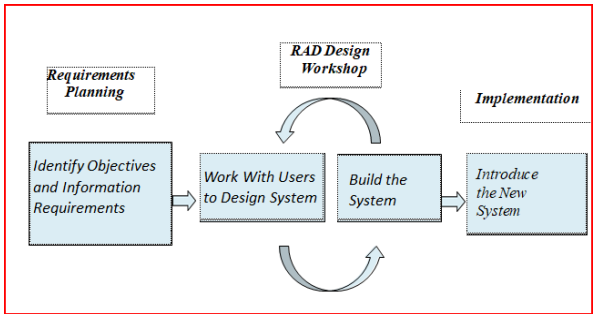


Figure 1: The RAD Method

The stages of the Rapid Application Development method are as follows:

1. Requirements Planning
   At this stage, the researcher and the user (admin) held a meeting to identify the primary objectives of the system to be developed. Based on this meeting, the information requirements were identified according to the system's objectives and the issues faced by PT. Rapi.

2. RAD Design Workshop
   This stage takes the form of a workshop or design session between system developers and users (admins). During this phase, programmers design the user interface and system workflow based on the needs identified in the previous stage. Each design is presented to the admins so they can provide feedback to the researchers, ensuring the system built addresses the challenges faced by PT. Rapi.

3. Implementation
   In this stage, the system design created by the programmers—which was subsequently approved—was developed into an information system. After a lengthy development process involving system updates and the incorporation of new features, the system underwent testing and was subsequently deployed at PT. Rapi in Prabumulih. The researchers used the Rapid Application Development (RAD) method because it can shorten the time required for the design and implementation of information systems.

4. Result and Discussion

The implementation phase is the process in which a previously designed system is put into use and made ready for operation. During this phase, testing is conducted to ensure that the system built meets the initial requirements and plans.

The interface implementation phase is the stage in which the designed user interface is integrated into the system so that it can be used by all users. During this phase, each component—such as menus, input forms, buttons, and information displays—is developed in accordance with the specifications provided by the client, PT. RAPI. The goal is to ensure that the system is easy to use, visually clear, and helps users navigate the application.

1. Account Registration Page

This page is the login page for the system, but you must register first in order to purchase tickets.

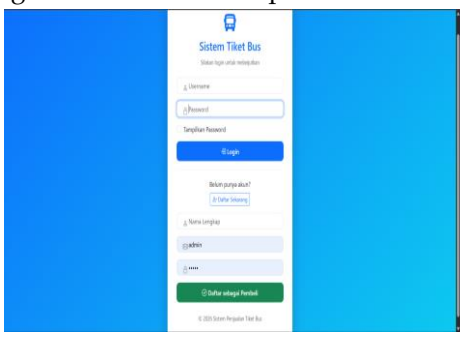


Figure 2: Account Registration

2. Login Form Page

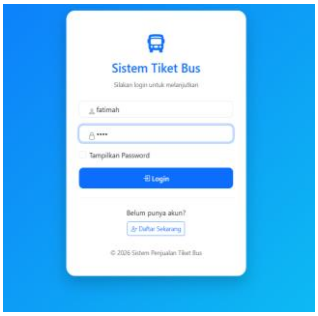


Figure 3: Login Form Page

To log in to the system, enter the correct username and password. If you enter an incorrect username or password, a notification message will appear.

3. Buyer Dashboard Page

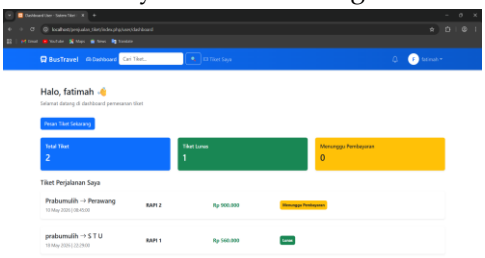


Figure 4: Buyer Dashboard Page

After successfully logging in, buyers will see this screen, where they can purchase tickets.

4. Booking Page

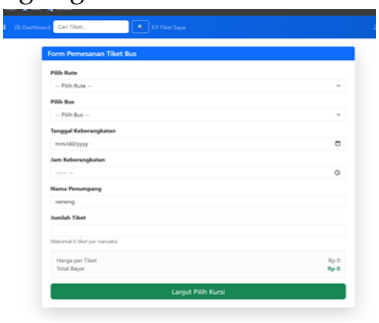


Figure 5: Booking Page

This Page Is For Booking Tickets By Filling Out The Provided Form.

4. Seat Selection Page



Figure 6: Seat Selection Page

After filling out the booking form, customers are asked to select their desired seats.

5. Booking History Page

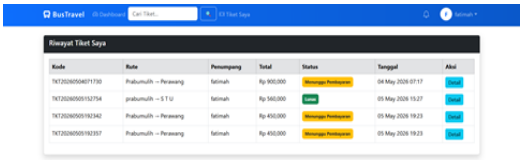


Figure 7: Booking History Page

Buyers can view their ticket purchase history.

6. Payment Details and Upload Proof of Payment Page

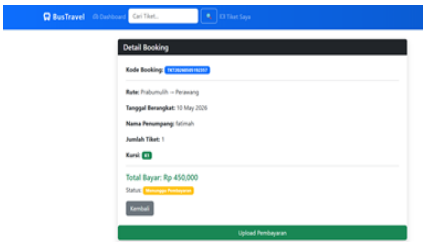


Figure 8: Booking Details Page

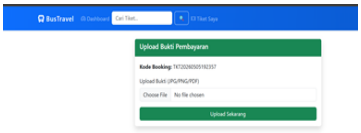


Figure 9: Payment Proof Upload Page

The details page is used to verify that the correct information has been entered and to upload proof of payment, which will later be reviewed by the administrator in the system.

7. Admin Dashboard Page

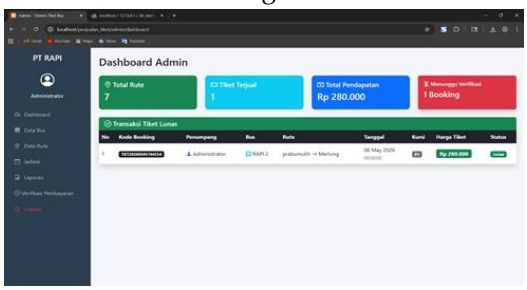


Figure 10: Admin Dashboard

The main admin page for managing and purchasing tickets both online and offline.

8. Routes, Buses, and Schedules Page

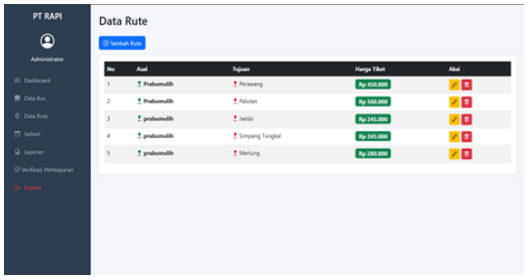


Figure 11: Route Page

To add the latest route created by the admin to the system.

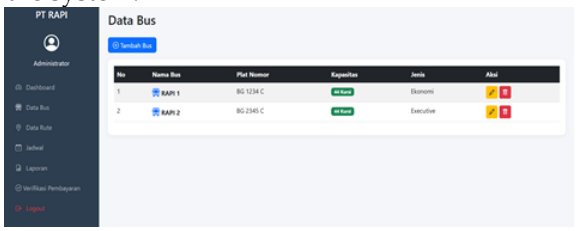


Figure 12: Bus Page

To add available bus data

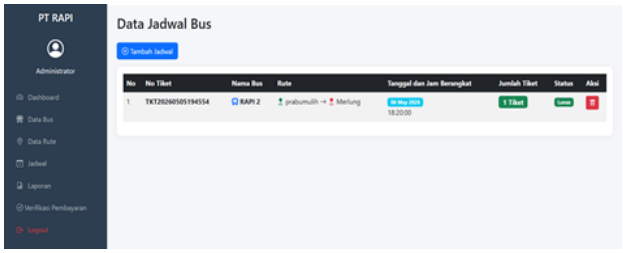


Figure 13: Schedule Page

Admins can record ticket purchases directly at the ticket counter. Admins can make offline reservations by filling out the appropriate information on the provided form.

9. Payment Verification Page

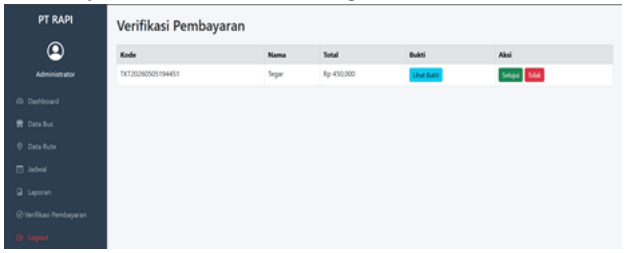


Figure 13: Payment Verification Page

This page helps administrators track ticket purchases made by buyers who have logged into the system by reviewing the payment receipts attached by the buyers.

10. Reports page in the admin panel

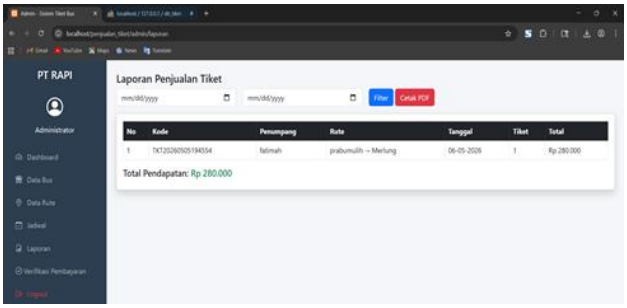


Figure 14: Report page in the admin panel

Admins can print reports for the desired date in PDF format.

11. Executive Dashboard Page

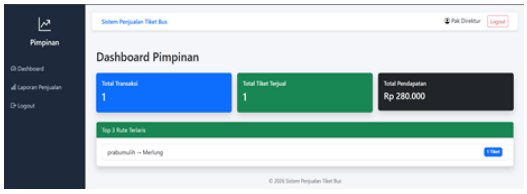


Figure 15: Executive Dashboard Page

This page displays general information and a summary of data that can help executives monitor the overall status of the system—such as the number of tickets sold, the most popular routes, and so on.

12. Report page for management

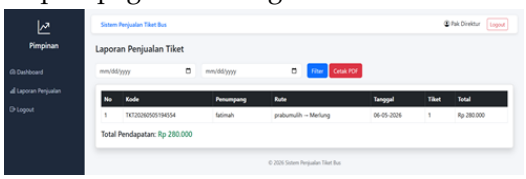


Figure 16: Management Report Page

This page displays key data from the system in an easy-to-understand format, allowing management to easily monitor performance and evaluate ongoing processes. Management can also print the report.

5. CONCLUSION

Based on the research, system development, and functional testing conducted on the bus ticket management and sales information system at PT. RAPI, it can be concluded that the application was successfully built using the Rapid Application Development (RAD) method, covering the stages of Requirements Planning, RAD Design Workshop, and Implementation. Active user involvement during the workshop phase ensured that system workflows, interfaces, and features directly matched the operational needs of PT. RAPI. The testing results demonstrate that the web-based system effectively automates key operational processes—including user registration, ticket booking, interactive seat selection, and payment receipt uploads—thereby eliminating manual ledger entries and minimizing data entry errors. Furthermore, the system successfully streamlines administrative tasks by enabling counter staff to manage routes, schedules, bus data, and payment verifications efficiently, while providing management with automated PDF report generation and an executive dashboard for real-time monitoring of ticket sales, revenue, and popular travel routes.

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