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Educational Practices and Management Information System in Managing Driving School on Website-Based GTC

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Abstract

Course institutions are indispensable to support people's education by taking courses that can explore their potential. Global Training Centre (GTC) is a driving school in Sragen. However, the current registration system still uses manual means, and data management has not been computerized, so that the performance is less effective and efficient. This research aims to design a web-based management information system in managing the driving school at GTC. The software development method uses the waterfall method by utilizing UML (Unified Modelling Language) consisting of ERD, case diagram, activity diagram, and wireframe. The results of website development research are to provide ease of participants in registering to the course and facilitate GTC in managing course institutions to produce more optimal services.

Keywords: information systems, driving school, website based

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Introduction

The rapid advancement of technology has impacted all aspects of human life, including politics, economics, culture, and education [1] [2]. The development which is supported by science holds up the progress in the field of information technology. It is unavoidable since information technology is an essential component in making all activities faster, more precise, and accurate [3]. As a result, course institutions use information technology to increase marketing and streamline work procedures [4].

A course institution is a type of educational institution that offers students the opportunity to develop their potential through courses [5]. The GTC course and training institution is an institution that provides driving training services in Sragen. However, the institution still uses a manual system that has not been automated in the participant registration process and data administration. Income reporting is recorded on the registration form paper, and its management is not yet standardized, with students being asked to come immediately to the location. In addition, the data search process will also be complicated [6] [7]. Data records might be lost or corrupted due to inefficient operations. Ineffectiveness and inefficiency can also cause a long time searching for data [8] [9].

The management information system design in managing the driving school at GTC uses the waterfall software development method. The waterfall method is a software development process that requires tasks to be completed in a specific order, beginning with system requirements analysis, system design, program code generation, program testing, and implementation or maintenance [10] [11].

The GTC website was developed in stages, including: (1) needs analysis using data collected from interviews with GTC, (2) website design, (3) writing program code (using the program code to translate the results of the analysis into a programming language), (4) testing to minimize errors and ensure the resulting output, and (5) implementation and maintenance [12].

The areas of research [13] that apply the waterfall methodology include communication, planning, modeling, construction, and deployment. The study results informed that the web-based Hospital Management Information System created in this design can be utilized to handle data for outpatients, inpatients, pharmacy services, and cashier services. Each service department can recap all patient data and financial data for cashiers and pharmacies. In designing a web-based hospital management information system, web programming language skills such as PHP, HTML, CSS, and java script are required so that the system can be completed more efficiently, both in terms of time and system source code. Before the system is converted into a program`mming language, good communication with the management is needed to create a management information system that meets hospital administration needs.

The research and development of a web-based HR management information system for this relevant research use the Unified Modeling Language (UML) method with a waterfall model, while the programming language used is Ruby with the Ruby on Rails framework and PostgreSQL database. From the implementation of the system, it can be concluded that the HR management information system makes the administration easier, faster, and more accurate. Furthermore, the system established allows for virtual absences to be performed in real-time, allowing the HR department to monitor data [14].

In research [15], the use of web-based information system applications can be a solution for inventory management. The Snape-IT program can be used because the content it contains strongly supports the company's needs. Still, a lot of content has to be adapted to the inventory management business process, which is still manual.

This research system was developed using the PHP programming language and the Laravel framework as tools, providing system security and utilizing MySQL as a database and responsive user interface. The GTC course and training institution was chosen as the object of information system development because the institution did not have a website-based information system to expand marketing, manage income, report data, and simplify the registration process.

Based on the problems outlined above, this research aims to create a web-based management information system for managing driving school at GTC. This program is expected to aid GTC in

handling student data, income reports, and expanding marketing by assisting prospective students in registering for courses. As a result, prospective participants can more easily obtain information such as course schedules and training packages, options, and prices through this website, rather than having to contact GTC directly, making it easier for GTC to manage data so that it is more secure and not easily lost or damaged.

Method

The waterfall method was utilized in the creation of software for GTC's course registration information system. The waterfall technique is a sequential software development process in which work is broken down into phases such as requirements analysis, system design, program code creation, program testing, implementation, and maintenance [16]. UML (Unified Modeling Language) was used to create this system, which comprises use case diagrams and activity diagrams. This research resulted in a website-based registration information system implemented at the GTC (Global Training Center). The flow chart below shows how GTC's course registration information system works.

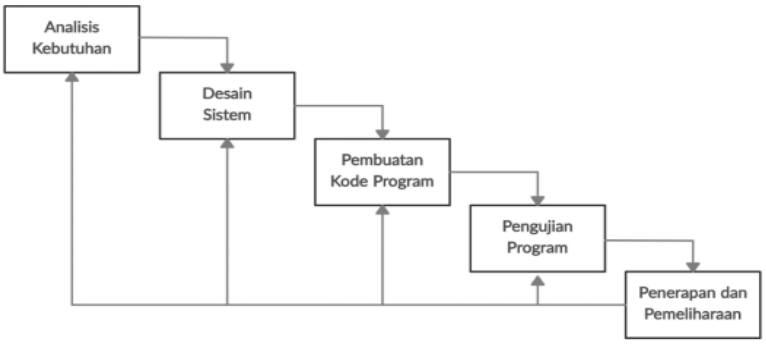


Figure 1. Waterfall method

1.1 Needs Analysis

This stage analysed and collected data as needed by interviewing the GTC (Global Training Center) manager to facilitate system development.

1.1.1 Functional needs

a. The system can assist the management of data of the driving school.

b. The system can display information about course packages.

c. Users can register through the system.

d. The system can generate income reports.

e. The system can provide a certificate of completion.

1.2 System Design

The system design provides an overview of the system to be created and documented. To develop the system design of the course registration website, this research used UML (Unified Modeling Language), which includes ERD, use case diagrams, activity diagrams, and wireframes.

1.2.1 Entity Relationship Diagram

ERD is a model used to compile a database and describe data related to the database to be designed [17]. The database on the GTC website consists of 12 tables, namely slides, addresses, cars, galleries, schedules, instructors, transactions, users, hours, packages, and details. Below are the details of the GTC website database.

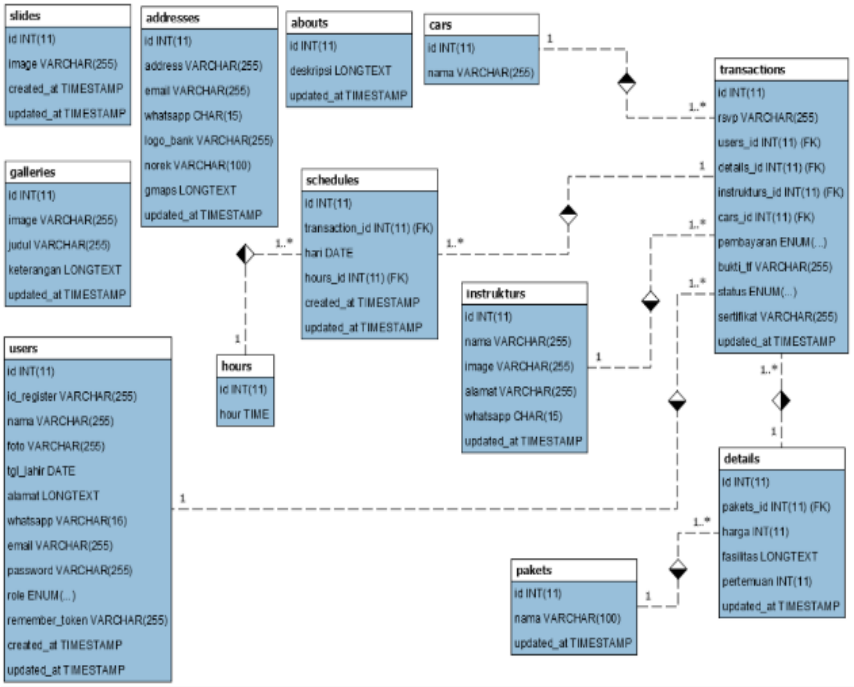


Figure 2. Entity relationship diagram

1.2.2 Use Case Diagram

On this website, there are two actors in the use case diagram: admin and member. Admin can access the system, set up the website, manage transactions, upload certificates, print reports, and manage schedules, among other things. Each member can perform tasks such as creating an account and logging in to complete a registration process. Once the course has been completed, and the member has been declared competent, the member can download a certificate. The following image shows the details of the admin and member use case diagrams.

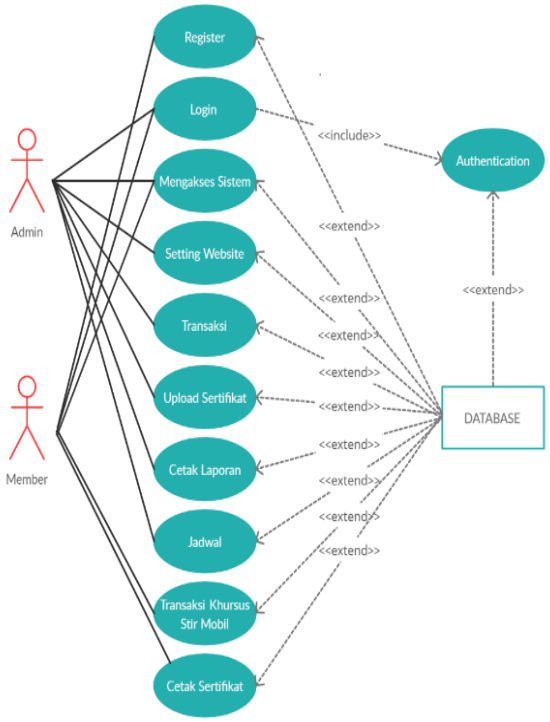


Figure 3. Use case diagram

1.2.3 Activity Diagram

The numerous activity processes in the designed system are depicted in activity diagrams. Every procedure begins with a determination of what can occur and how it will conclude [18]. Figure 4 depicts how admins and members interact with the website. Members must first register in order to log in to the system and register for courses. Admins can log in using their electronic mail (email) and password. Next, members select a package from GTC, the instructor, vehicle, and payment method. If the member prefers a direct payment method, he or she can go to the GTC office. However, if the members choose to transfer, they make direct transfers to the GTC account number provided, based on the price of the selected package. The member uploads the proof of transfer after a successful transfer, and the admin confirms. The member then selects a course schedule based on the package purchased, which the admin then confirms. If a member completes the course and is declared successful, the administrator uploads the certificate for the member to download.

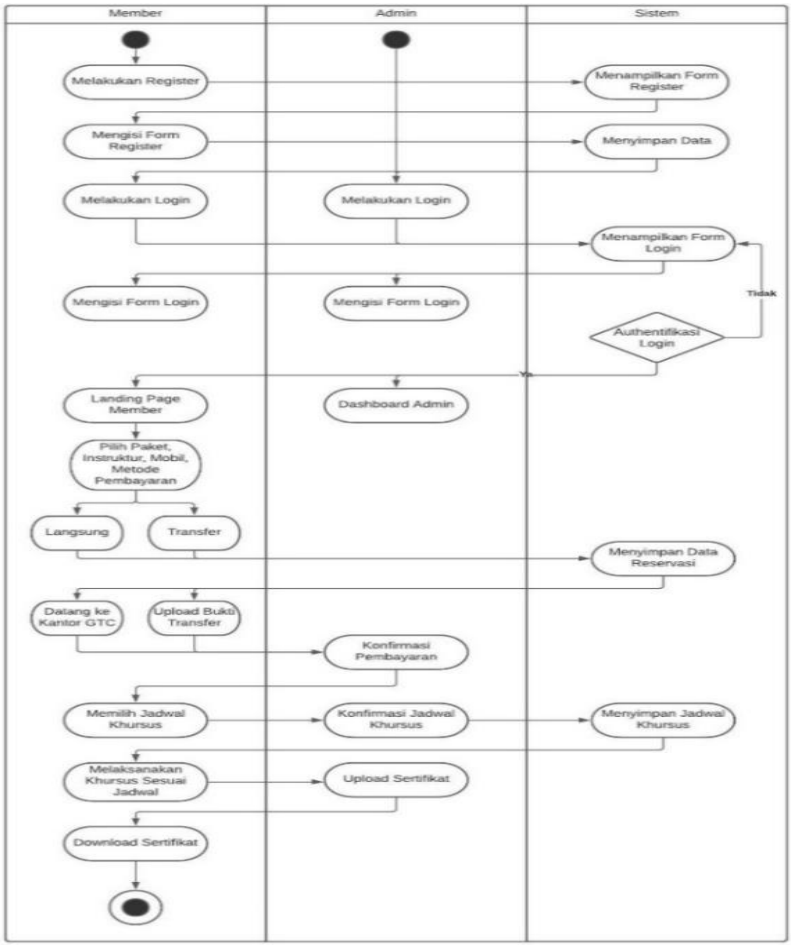


Figure 4. Activity diagram

1.2.4 Wireframe

A wireframe is a framework for designing website pages before being implemented into the actual website.

1. The login page is a page to verify the account that will enter the GTC webpage. The login interface is shown below.

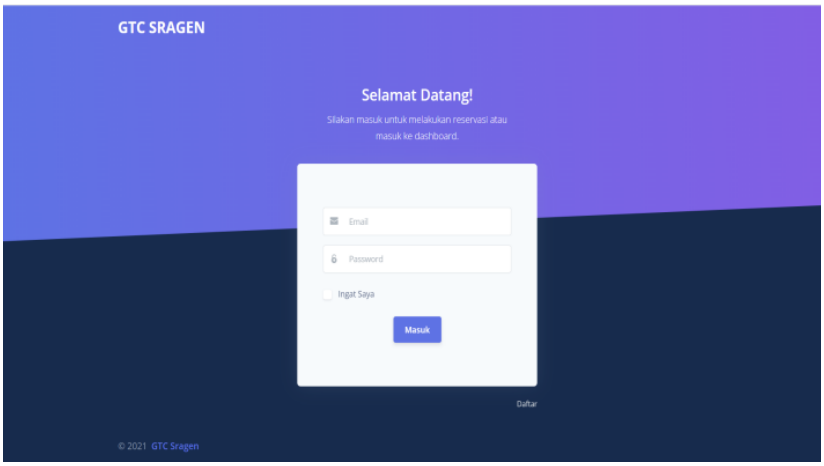


Figure 5. Login page

2. The users use the registration page to register on the GTC website. Below is the model of the registration page.

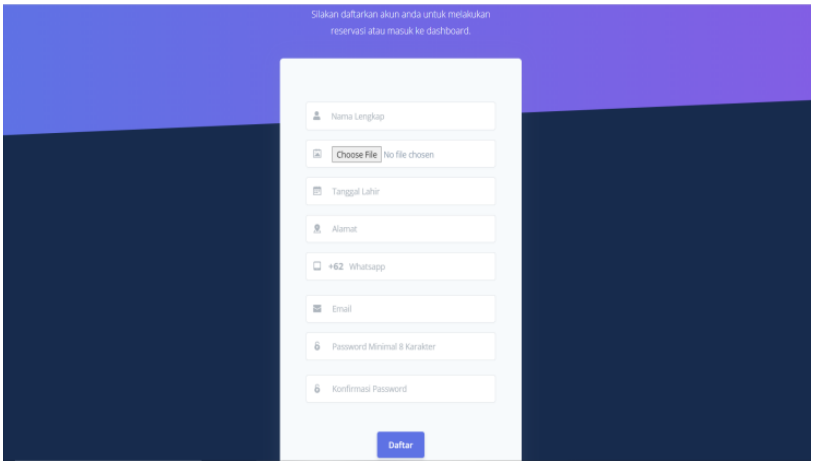


Figure 6. Registration page

3. The main page is the initial display of the website before the admin and user login. The main page model is shown below.

Figurer 7. Main page

4. The admin dashboard page is the main page after the admin is successfully log in. Admin can manage the website, transaction, and schedule. The model of the admin dashboard page is shown below.

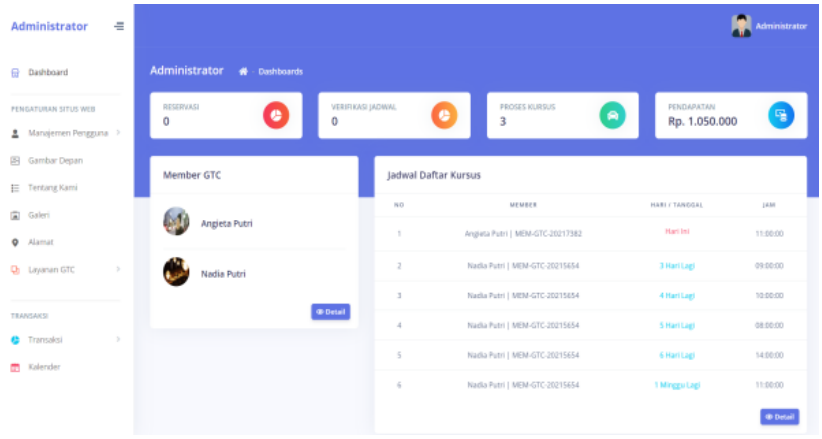


Figure 8. Admin dashboard page

a. Program Code Writing

This is a stage of converting a design into program code so that the computer can understand the commands. Program code writing of the GTC website was done using the Laravel framework as the back end and the Boostrap framework as the front end.

b. Program Testing

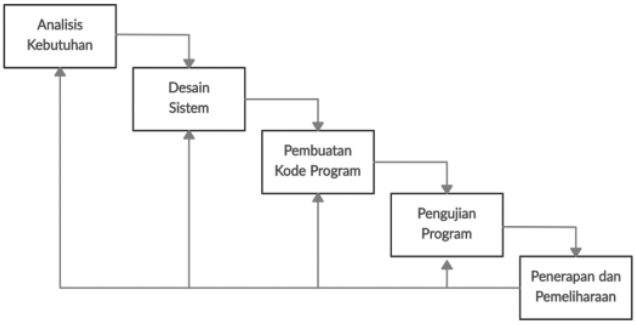
The program testing stage is used after the system has been completed. This is done to ensure that the software is free of errors. This test is conducted using the black box testing method and the System Usability Scale for usability testing (SUS). Black box testing is a type of test that is performed using data from the specifications. This test focuses on the output generated in response to the input to the system [19]. The System Usability Scale (SUS) is a questionnaire that is used to assess the usability of a system from the user's perspective. [20].

c. Implementation and Maintenance

Implementation and maintenance can be applied directly to the GTC Sragen admin. If there is an issue with the system, it will be improved to function properly.

Results and Discussion

The waterfall method was utilized in the creation of software for GTC's course registration information system. The waterfall technique is a sequential software development process in which work is broken down into phases such as requirements analysis, system design, program code creation, program testing, implementation, and maintenance [16]. UML (Unified Modeling Language) was used to create this system, which comprises use case diagrams and activity diagrams. This research resulted in a website-based registration information system implemented at the GTC (Global Training Center). The flow chart below shows how GTC's course registration information system works.



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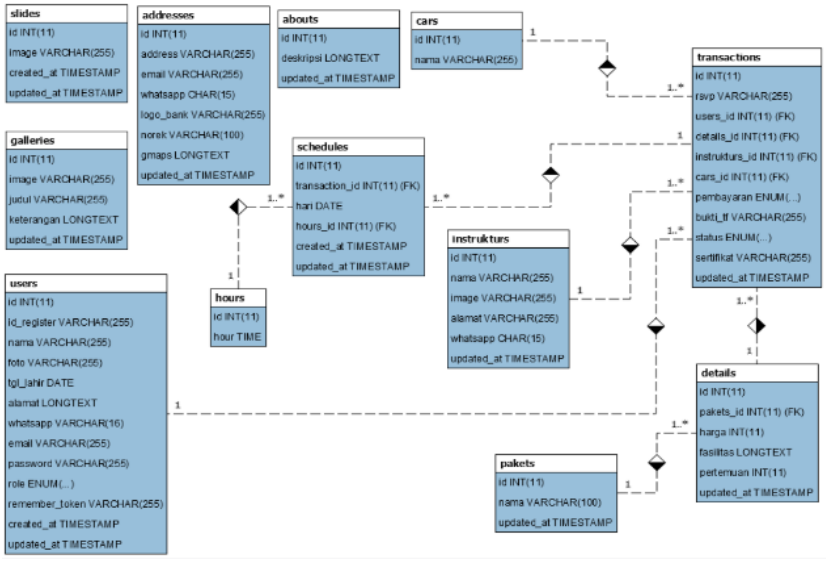

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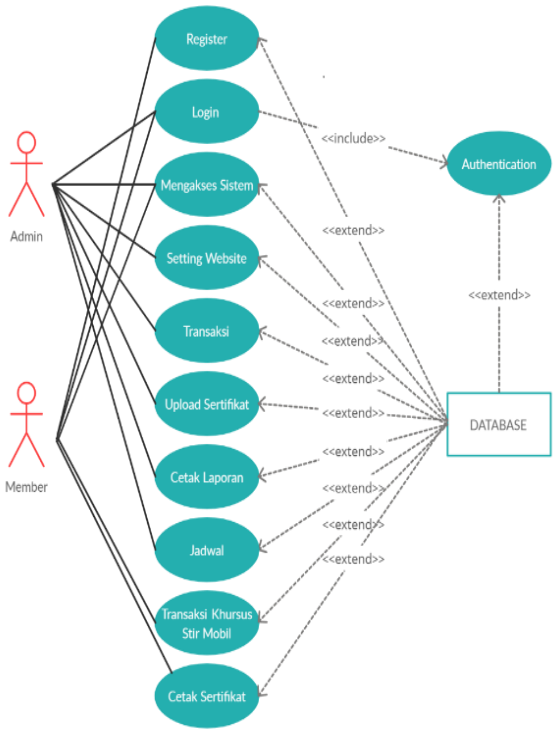

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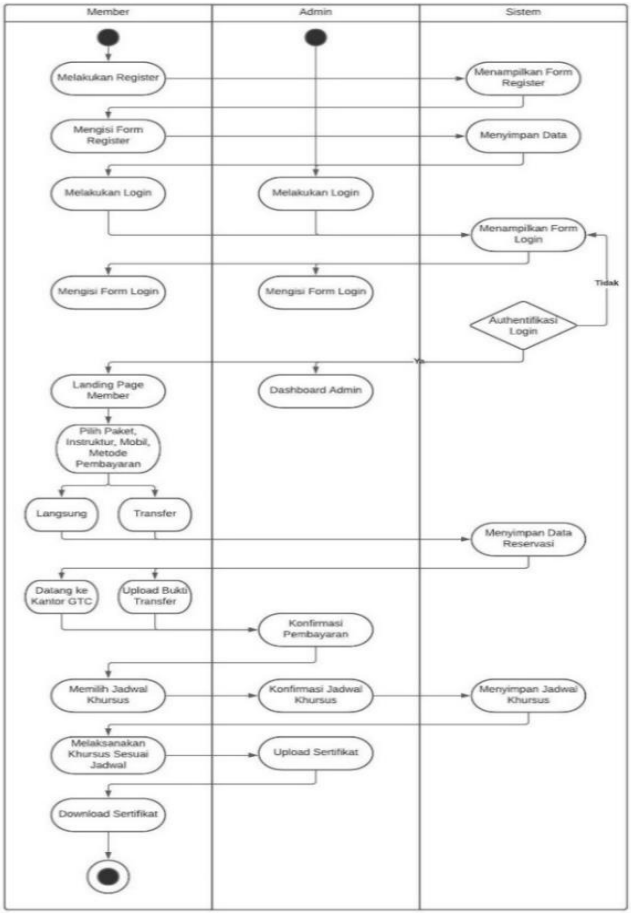

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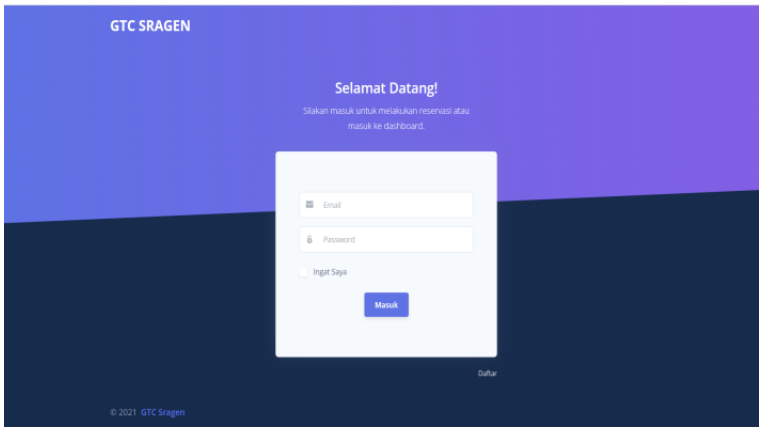

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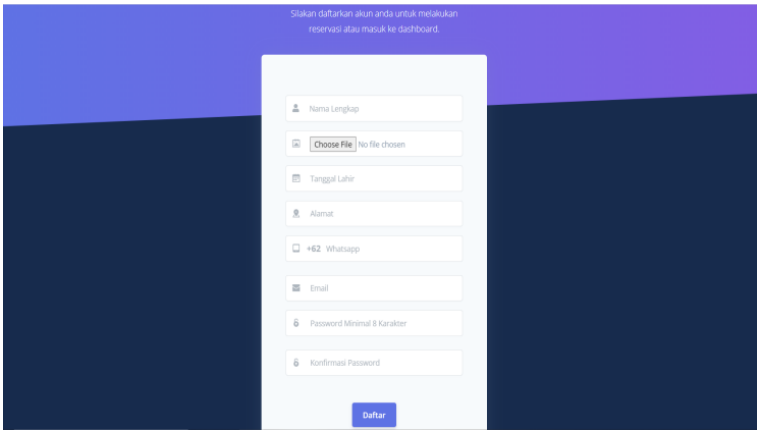

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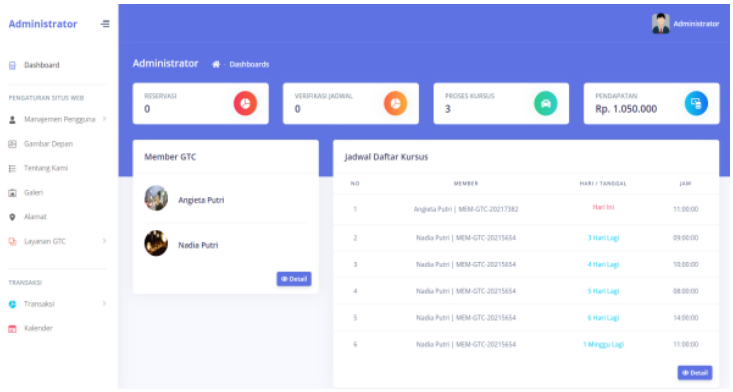

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Conclusions

GTC's driving school management information system has been successfully built, with features such as members being able to download completion certificates for the courses and administrators being able to print income reports. This system was put through its paces using two different test methods: blackbox testing and the System Usability Scale (SUS). Based on the results of the system testing, it can be concluded that the Blackbox test indicates that the system is performing as expected, while the SUS test suggests that the system is acceptable to the user with an average value of 79.25. After the system is implemented, it is hoped that it would improve transaction efficiency and data management at GTC Sragen.

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