

Web-Based School Information System Using the Laravel Framework as a Platform for Information and Promotion at High Schools

Vita Ulvita Sari¹, Yoyon Arie Budi²

^{1,2} Sekolah Tinggi Ilmu Komputer Banyuwangi, Jawa Timur, Indonesia

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Abstract

This study aims to design and implement a web-based school information system application as a medium for disseminating information and a promotional tool at PGRI Purwoharjo High School. The problem faced is the limitation of information dissemination, which remains conventional and is therefore ineffective and inefficient in reaching the wider community. The research method employed the System Development Life Cycle (SDLC) using the Waterfall model, which includes the stages of requirements analysis, system design, implementation, testing, and maintenance. The system was developed using the Laravel framework, which supports structured and dynamic data management. The results of this study show that the developed system is capable of effectively providing information services, including school profiles, news, announcements, and online registration services for new students. In addition, this system also serves as a promotional medium capable of enhancing the school's visibility and image within the community. Thus, the implementation of this web-based information system is expected to improve the quality of information services and support digital transformation within the school environment..

Corresponding Author:

Vita Ulvita Sari,
vitacomel23@gmail.com

INTRODUCTION

The rapid development of information technology in this digital age has had a significant impact on various aspects of life, including education. Digital transformation has prompted educational institutions to adapt by utilizing technology as a means of disseminating information, promoting their programs, and communicating. One way this technology is being utilized is through the development of institutional websites that serve as information and publication platforms for the general public [1] In an age filled with various digital platforms and social media, promotion has become crucial for educational institutions to reach potential students [2]

PGRI Purwoharjo High School in Banyuwangi, as a secondary education institution, requires a web-based system capable of presenting information quickly, accurately, and in a structured manner. The information provided includes the school profile, teacher data, vocational programs, extracurricular activities, facilities, news about events, event documentation, and other information relevant to the public. However, based on observations, the website's design is still suboptimal and does not fully support ease of use for either users or school administrators in disseminating information or managing content. This situation has resulted in the management of information becoming less effective and unstructured.

Based on the findings presented above, the research question for this study is: How can a web-based school information system be designed and developed for PGRI Purwoharjo High School to facilitate information management by school administrators and operators, and how can the developed information system enhance the effectiveness and efficiency of information dissemination to students, teachers, and the general public? Based on the presentation, the author conducted this study with the aim of helping to resolve existing issues by developing a web-based platform for disseminating school information—serving as a means of information and promotion for SMA PGRI Purwoharjo—to help expand the reach of information, thereby making it easier for prospective students, parents, and the general public to obtain information about the school of their choice. It is hoped that this research will benefit the school by making it easier to manage and convey information effectively, efficiently, and in a structured manner to students, teachers, parents, and the general public.

Algorithms such as Decision Tree, Neural Network, K-Nearest Neighbor, Gradient Boosted Trees, Support Vector Regression, and Random Forest possess different characteristics and levels of complexity that influence prediction accuracy and computational efficiency (Cucos & Iantovics, 2024; Alarfaj et al., 2022). These algorithms were selected because of their ability to produce highly accurate predictions while maintaining computational efficiency, with each algorithm offering distinct advantages in learning data patterns, handling complex variables, and prediction speed (Karimi et al., 2025; Özlem & Tan, 2022). Several recent studies have emphasized the importance of selecting algorithms that match the characteristics of the dataset to achieve optimal prediction performance (Lee et al., 2021). Therefore, a comprehensive comparative analysis is required to determine the most effective algorithm for improving model performance, particularly in terms of prediction accuracy and efficiency (Sari & Prabowo, 2025).

Despite these studies, no previous research has simultaneously compared six widely used algorithms using the Altair Studio platform for house price prediction analysis. Altair Studio was selected because of its comprehensive capabilities in supporting data analysis by allowing users to visually construct analytical workflows through interconnected operators, including data preprocessing, predictive and descriptive modeling, model evaluation, visualization, and automated learning features, making it highly efficient for Data Mining tasks (Taranto-Vera et al., 2021). This study is expected to provide a more comprehensive understanding of the effectiveness of various Machine Learning algorithms in predicting house prices. Furthermore, the findings are expected to serve as a valuable reference for system developers and property business practitioners in selecting a prediction model that is more accurate, efficient, and easy to implement using Altair Studio.

METHOD

The method used in this study employs a Data Mining approach to analyze and compare the performance of several Machine Learning algorithms for house price prediction. Data Mining is a systematic approach to discovering hidden information from data so that it can be utilized optimally. It not only focuses on information extraction but also plays an important role in developing predictive models capable of estimating future values or behaviors based on the available data (Warjiyono et al., 2024).

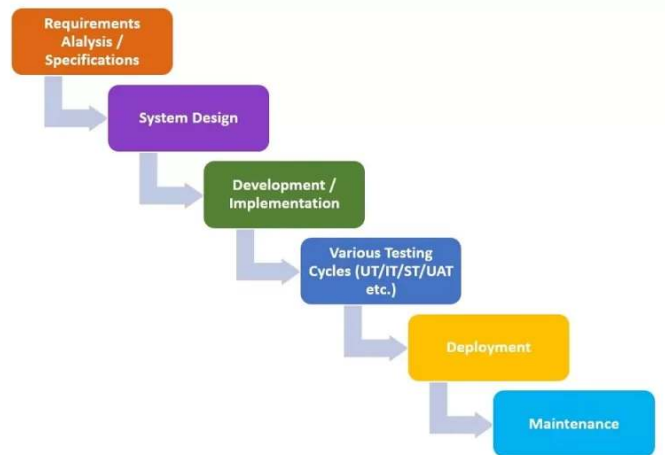


Figure. 1. Methods Waterfall

System Requirements Analysis in this phase, an analysis of system requirements was conducted based on the results of observations, questionnaires, and interviews with relevant parties at PGRI Purwoharjo High School in Banyuwangi.

Observations were conducted by directly observing the processes of promotional activities and information dissemination taking place at SMA PGRI Purwoharjo Banyuwangi [3]. Based on the observation results, it was found that promotional activities and the dissemination of information to students, parents, and the community are still carried out manually through social media groups, bulletin boards, and direct communication by school officials. This process presents several challenges, such as difficulties in managing data and a lack of information dissemination to students, parents, or the community. These conditions result in less effective information dissemination because the process of updating information takes longer. Access to information for the community is less than optimal. The research process consisted of several sequential stages: problem identification, literature review, data collection, data preprocessing, algorithm implementation, result evaluation, comparative analysis, and conclusion. Each stage was conducted systematically to develop an effective house price prediction model for each algorithm evaluated. The detailed explanation of each research stage is presented as follows:

Interviews were conducted with school administrators, the principal, and administrative staff. The purpose of these interviews was to gather information regarding the school's current information dissemination system, the management of the school profile, the challenges faced, and the system requirements needed to improve the efficiency and quality of school information services [4]

Based on the interview results, it was found that the process of disseminating information at the school is still carried out manually through social media groups and bulletin boards. In addition, information regarding the school's profile, activities, achievements, and new student admissions has not yet been compiled into a single integrated platform, making it difficult for the public to access complete and up-to-date information.

RESULTS AND ANALYSIS

This phase involves designing the system architecture, process flow, and user interface for the application to be developed. The purpose of this design is to provide a comprehensive overview of the system's workflow and functionality prior to the implementation phase [5]. The system's business processes begin when an administrator or website manager manages content through the backend system, such as updating school news, the school gallery, and managing profiles and settings.

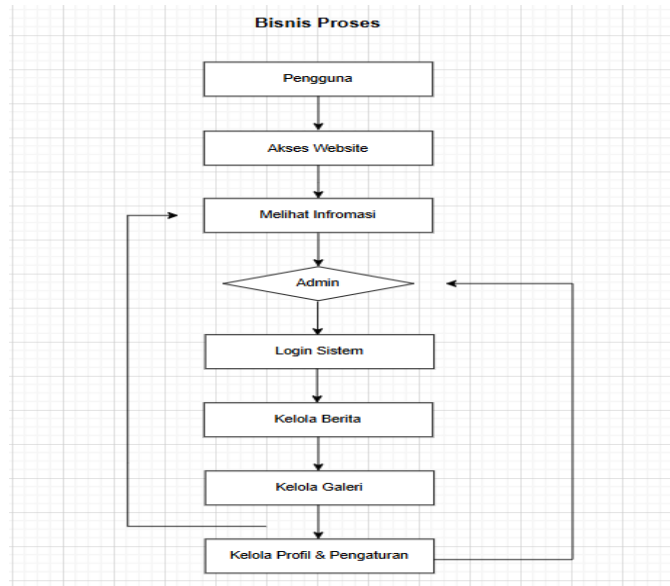


Figure. 2. Process Analysis

Data managed by the admin will be stored centrally in the Supabase database and displayed dynamically on the website. Visitors access the SMA PGRI Purwoharjo Banyuwangi company profile website via a browser. The website displays information responsively and in real time, based on the data managed by the admin. Visitors can view the school profile, school news, gallery, vision and mission, the principal's message, available programs, as well as information on student admissions, location, and contact details without logging in. The entire information dissemination process is one-way, with the website serving as a digital publication and reference platform. With this company profile website, SMA PGRI Purwoharjo Banyuwangi can consistently convey information, enhance the credibility of its operations, and strengthen its presence in the digital age.

The use case diagram for the SMA PGRI Purwoharjo Company Profile website illustrates the interactions between the Admin and Visitors when using the system. Visitors can access various school information without logging in, such as the school profile, programs, gallery, news, student admissions (PPDB), and contact information. Meanwhile, the Admin can log in to manage and update the website's content. This system serves as a platform for information, promotion, and digital branding, facilitating the rapid, accurate, and centralized dissemination of school information.

An activity diagram is a visual representation of the sequence of activities or workflows in a specific software application or system (Hartanti, G. J et al., 2022) [6]. The activity diagram for the SMA PGRI Purwoharjo Company Profile website illustrates the flow of activities between Visitors, the System, and the Admin. Visitors access the website to view school information such as the profile, programs, teachers, gallery, news, student admissions, and contact details, which are displayed by the system based on data in the database. Meanwhile, the Admin logs into the dashboard to manage and update the website's content. Any data changes made by the admin are saved to the database and automatically displayed on the website, ensuring that the available information is always up to date. Thus, the website serves as an integrated medium for school information and promotion.

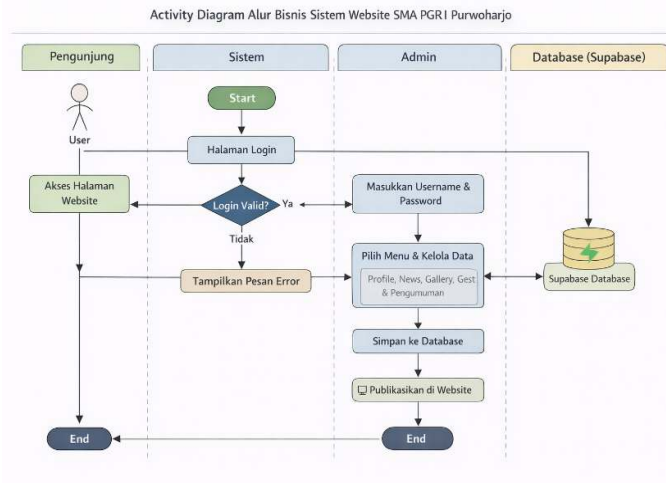


Figure. 3. Proses Activity Diagram

The class diagram model presents the structural overview of the website that has been developed, as shown in the figure above. The class diagram for the SMA PGRI Purwoharjo Company Profile website consists of several interconnected classes designed to support the management and presentation of school information. Each class has a different function depending on the type of data managed within the system.

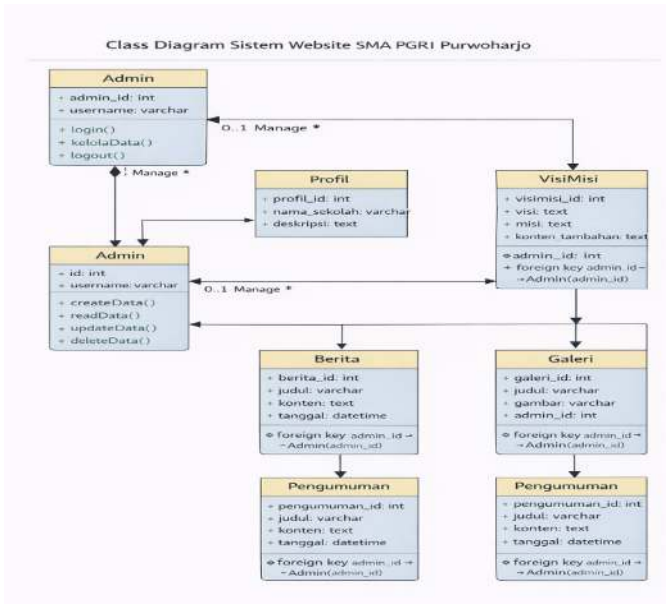


Figure. 4. Class Diagram

The Class Admin serves as the primary system administrator with access rights to log in and manage all website content. The admin can add, edit, and delete data related to the school profile, vision and mission, news, gallery, and announcements. The Class Profile is used to store general information about SMA PGRI Purwoharjo. The data managed includes the school name, brief history, school profile, and other basic information displayed on the website's profile page. The Vision and Mission Class is used to store the school's vision and mission statements. This information is used to explain the goals, direction, and values that guide the school's educational programs. The News Class is used to manage the latest information related to school activities and developments. The data stored includes the news headline, news content, and publication date, which will be displayed on the website's news page. The Gallery class is used to store documentation of school activities in the form of

photos or images. Gallery data serves as a visual medium to showcase the school's various activities and achievements to website visitors. The Announcements class is used to store official information or notifications from the school. The information displayed may include activity schedules, academic information, or other important announcements that students, parents, and the community need to know.

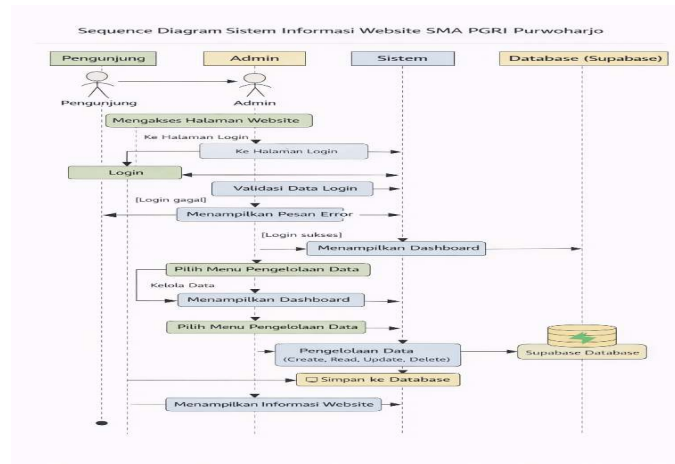


Figure. 4. Sequence Diagram

The sequence diagram illustrates the sequence of interactions between Visitors, Admins, the System, and the Database (Supabase) in executing business processes on the SMA PGRI Purwoharjo website. The process begins when a Visitor accesses the SMA PGRI Purwoharjo website via a browser. The system then processes the request and displays a webpage containing various school information, such as the profile, programs, news, gallery, announcements, and the student admission process (PPDB), which are accessible to visitors. The second process begins when the Admin accesses the login page and enters a username and password. The system then validates the login credentials by matching them against the data stored in the database. If the credentials are valid, the system displays the admin dashboard for managing website content. The third process occurs when the Admin selects data management menus, such as school profile, vision and mission, news, gallery, announcements, contact, and student admissions. The Admin can perform Create, Read, Update, and Delete (CRUD) operations on the managed data. The fourth process occurs when data added or updated by the Admin is sent to the system to be processed and stored in the Supabase database. The database then saves the data changes made. The fifth process is the final stage, in which the system retrieves the latest data from the database and displays it on the website. Visitors can immediately access the updated information, ensuring the website always presents the most current information.

System Implementation

The implementation phase involved writing program code based on the design that had been created. The system was developed using the PHP programming language and the Laravel framework, as well as a MySQL database [7]. The implementation process was carried out iteratively, with each feature being built, tested, and adjusted in real time based on feedback from the school throughout the development process. The initial implementation resulted in a home page that serves as a public information hub for visitors. On this page, users can access various important information, such as the school profile, teacher profiles, news, an activity gallery, and student admission information. The layout is designed to be responsive so it can be accessed on a variety of devices, including both desktop and mobile devices.

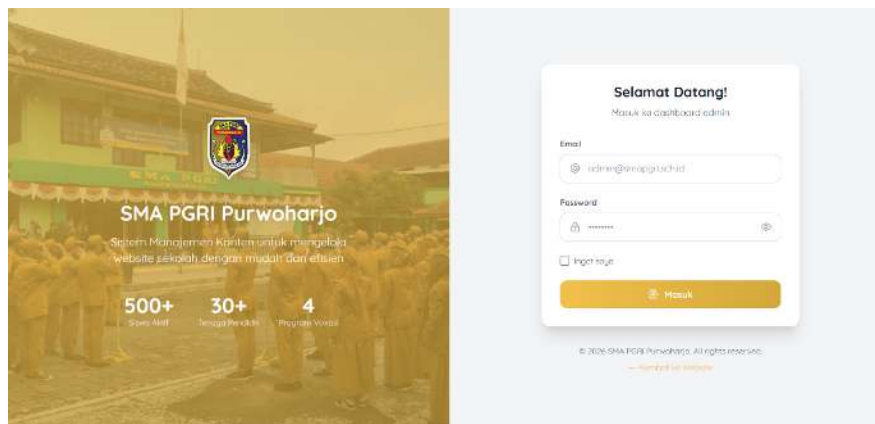


Figure. 4. Website Home Page

Implementation of a login page that serves as an authentication mechanism for administrators. Administrators must enter their email address and password before accessing the system. This authentication feature is designed to safeguard data security and ensure that only authorized users can make changes to the content. After successfully logging in, the admin is directed to the dashboard page, which serves as the central hub for managing all website content. On the dashboard, the admin can perform various important tasks, including: Adding, editing, and deleting school profile information; managing news and the school's welcome message; uploading and organizing the school activity photo gallery; managing vocational program information; and adding, editing, and deleting information about teachers and school staff.

System Testing Once the implementation process is complete, a testing phase is conducted to ensure that all website functions are working properly. Testing was performed using the Blackbox Testing method, which focuses on testing the system's functionality from the user's perspective without examining the internal structure of the code. Through this method, each feature is tested based on expected inputs and outputs. The goal is to ensure that the system works according to user needs, is free of functional errors, and can be used optimally.

CONCLUSIONS

Based on the research findings, a Web-Based School Information System application using the Laravel framework was successfully developed and implemented at PGRI Purworejo High School in Banyuwangi as a platform for school information and promotion. This system is capable of centrally managing and presenting school information, such as the school profile, teachers and staff, vocational programs, news, a photo gallery, and the student admission process (PPDB). Black-box testing showed that all system features functioned according to the expected scenarios. Further development can be carried out by adding online student admission features, an academic management system, and social media integration. Additionally, regular system maintenance is necessary to ensure security, performance, and the accuracy of the information displayed.

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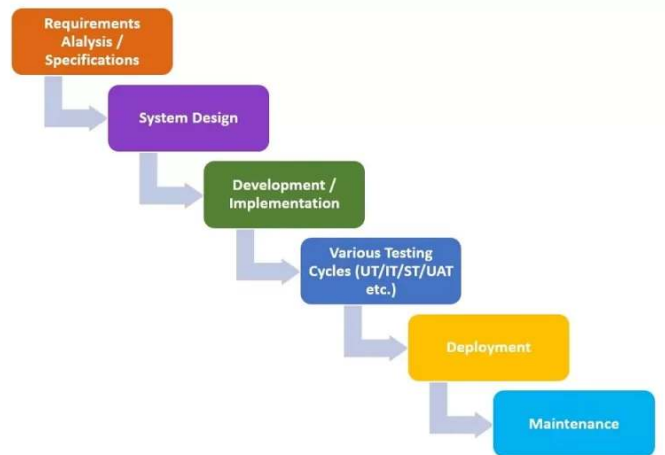


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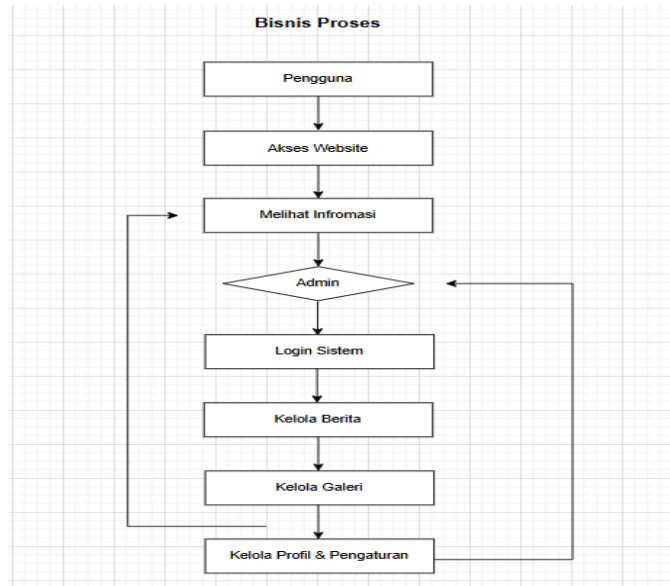


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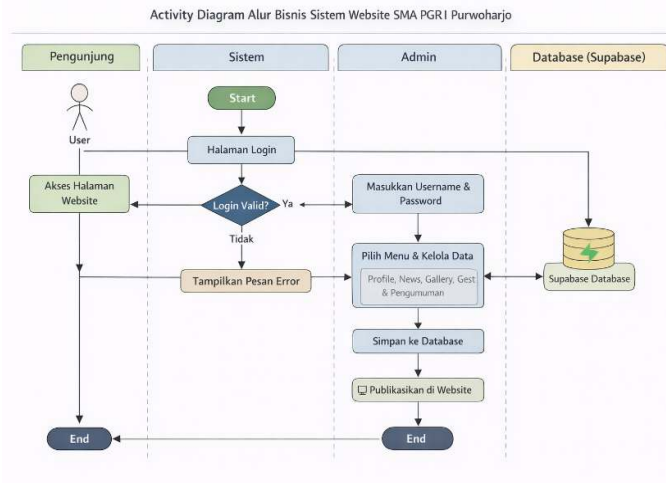


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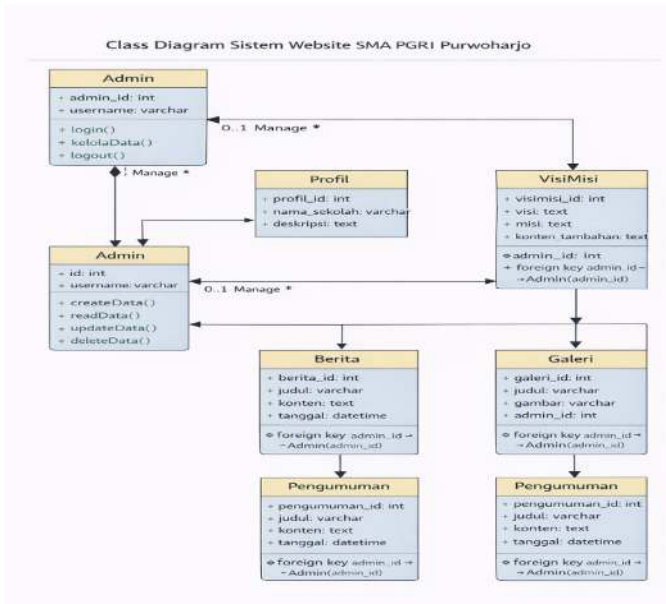


Figure. 4. Class Diagram

The Class Admin serves as the primary system administrator with access rights to log in and manage all website content. The admin can add, edit, and delete data related to the school profile, vision and mission, news, gallery, and announcements. The Class Profile is used to store general information about SMA PGRI Purwoharjo. The data managed includes the school name, brief history, school profile, and other basic information displayed on the website's profile page. The Vision and Mission Class is used to store the school's vision and mission statements. This information is used to explain the goals, direction, and values that guide the school's educational programs. The News Class is used to manage the latest information related to school activities and developments. The data stored includes the news headline, news content, and publication date, which will be displayed on the website's news page. The Gallery class is used to store documentation of school activities in the form of

photos or images. Gallery data serves as a visual medium to showcase the school's various activities and achievements to website visitors. The Announcements class is used to store official information or notifications from the school. The information displayed may include activity schedules, academic information, or other important announcements that students, parents, and the community need to know.

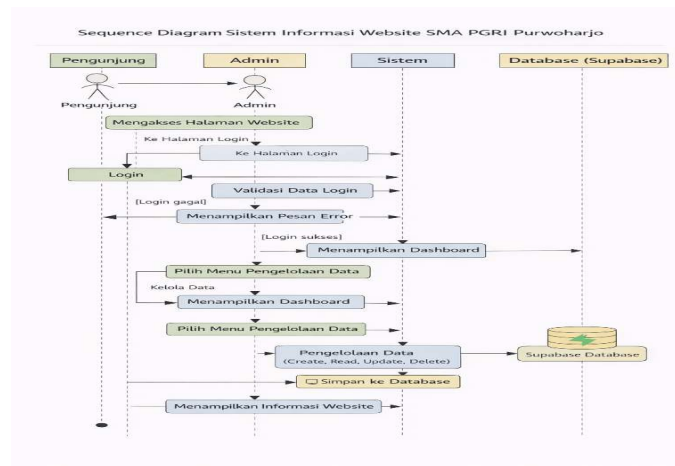


Figure. 4. Sequence Diagram

The sequence diagram illustrates the sequence of interactions between Visitors, Admins, the System, and the Database (Supabase) in executing business processes on the SMA PGRI Purwoharjo website. The process begins when a Visitor accesses the SMA PGRI Purwoharjo website via a browser. The system then processes the request and displays a webpage containing various school information, such as the profile, programs, news, gallery, announcements, and the student admission process (PPDB), which are accessible to visitors. The second process begins when the Admin accesses the login page and enters a username and password. The system then validates the login credentials by matching them against the data stored in the database. If the credentials are valid, the system displays the admin dashboard for managing website content. The third process occurs when the Admin selects data management menus, such as school profile, vision and mission, news, gallery, announcements, contact, and student admissions. The Admin can perform Create, Read, Update, and Delete (CRUD) operations on the managed data. The fourth process occurs when data added or updated by the Admin is sent to the system to be processed and stored in the Supabase database. The database then saves the data changes made. The fifth process is the final stage, in which the system retrieves the latest data from the database and displays it on the website. Visitors can immediately access the updated information, ensuring the website always presents the most current information.

System Implementation

The implementation phase involved writing program code based on the design that had been created. The system was developed using the PHP programming language and the Laravel framework, as well as a MySQL database [7]. The implementation process was carried out iteratively, with each feature being built, tested, and adjusted in real time based on feedback from the school throughout the development process. The initial implementation resulted in a home page that serves as a public information hub for visitors. On this page, users can access various important information, such as the school profile, teacher profiles, news, an activity gallery, and student admission information. The layout is designed to be responsive so it can be accessed on a variety of devices, including both desktop and mobile devices.

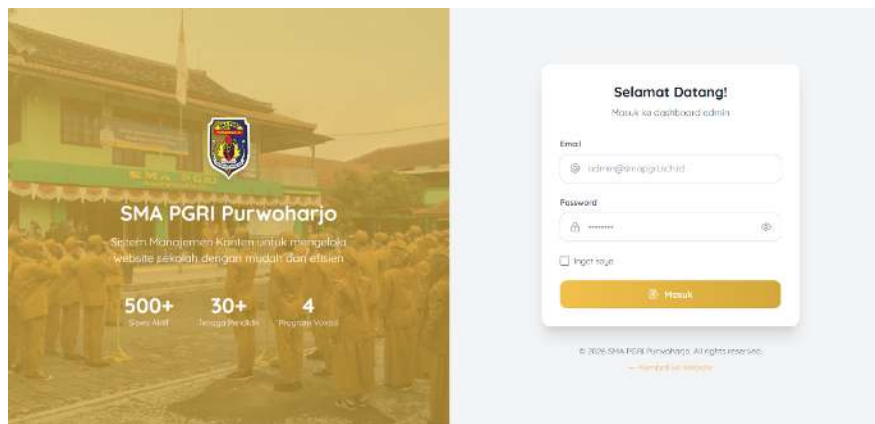


Figure. 4. Website Home Page

Implementation of a login page that serves as an authentication mechanism for administrators. Administrators must enter their email address and password before accessing the system. This authentication feature is designed to safeguard data security and ensure that only authorized users can make changes to the content. After successfully logging in, the admin is directed to the dashboard page, which serves as the central hub for managing all website content. On the dashboard, the admin can perform various important tasks, including: Adding, editing, and deleting school profile information; managing news and the school's welcome message; uploading and organizing the school activity photo gallery; managing vocational program information; and adding, editing, and deleting information about teachers and school staff.

System Testing Once the implementation process is complete, a testing phase is conducted to ensure that all website functions are working properly. Testing was performed using the Blackbox Testing method, which focuses on testing the system's functionality from the user's perspective without examining the internal structure of the code. Through this method, each feature is tested based on expected inputs and outputs. The goal is to ensure that the system works according to user needs, is free of functional errors, and can be used optimally.

CONCLUSIONS

Based on the research findings, a Web-Based School Information System application using the Laravel framework was successfully developed and implemented at PGRI Purworejo High School in Banyuwangi as a platform for school information and promotion. This system is capable of centrally managing and presenting school information, such as the school profile, teachers and staff, vocational programs, news, a photo gallery, and the student admission process (PPDB). Black-box testing showed that all system features functioned according to the expected scenarios. Further development can be carried out by adding online student admission features, an academic management system, and social media integration. Additionally, regular system maintenance is necessary to ensure security, performance, and the accuracy of the information displayed.

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