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DEVELOPMENT OF INFORMATION SYSTEM FOR ALUMNI DATA PROCESSING USING CAKEPHP FRAMEWORK

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Abstract: This research project delves into the development of an Information System tailored specifically for efficient alumni data processing, leveraging the capabilities of the CakePHP framework. Recognizing the pivotal role of organized alumni data in educational institutions, this study aims to design and implement a system that seamlessly manages a spectrum of information, including personal details, academic achievements, professional experiences, and contact information. The chosen CakePHP framework is esteemed for its robust architecture and adherence to the MVC pattern, offering rapid development possibilities. Key objectives include comprehensive system design, secure database integration, user authentication, data entry modules, search and reporting features, communication tools, mobile responsiveness, and rigorous testing methodologies. Through this project, we seek to contribute insights into the efficacy of CakePHP in building scalable and maintainable information systems, ultimately enhancing the institution's alumni engagement and management processes.

INTRODUCTION

In the dynamic landscape of educational institutions, maintaining a strong connection with alumni is essential for fostering a sense of community and collaboration. The effective management and processing of alumni data play a pivotal role in achieving this goal(1). This research project focuses on the development of an Information System tailored specifically for the efficient processing of alumni data, with a particular emphasis on leveraging the capabilities of the CakePHP framework.

As educational institutions seek to enhance their alumni engagement strategies, the need for a comprehensive and user-friendly system becomes increasingly apparent. The CakePHP framework, renowned for its rapid development features and adherence to the Model-View-Controller (MVC) architecture, presents an ideal platform for creating scalable and efficient information systems(2).

This research aims to address key aspects of alumni data processing, including system design, secure database integration, user authentication, and the implementation of innovative features such as search and reporting functionalities. By utilizing CakePHP, we aspire to streamline data entry processes, improve data accessibility, and facilitate seamless communication between educational institutions and their alumni.

Through the exploration of CakePHP's capabilities in the context of alumni data processing, this research seeks to contribute valuable insights into the development of effective and sustainable information systems for educational institutions[3]. Ultimately, the goal is to empower institutions to strengthen their alumni relationships, harnessing the benefits of modern frameworks for enhanced data management and communication.

RESEARCH METHODS

1. System Information

An information system is a comprehensive framework designed to manage and process data in order to facilitate effective decision-making and organizational operations. Comprising various interconnected components, an information system typically includes hardware, such as computers and servers, software applications for specific functionalities[4], a database to store and retrieve data, and the individuals who interact with the system. These systems are integral to modern organizations, serving as the backbone for storing, processing, and disseminating information across different departments and levels of an enterprise.

The hardware components provide the physical infrastructure for the system to operate, encompassing devices such as servers, computers, and networking equipment. Software applications, on the other hand, are the programs that dictate the system's functionality, enabling users to perform specific tasks, analyze data, and streamline processes[5]. The data component involves the information processed and stored within the system, representing the raw facts and figures that contribute to informed decision-making.

Crucially, the human element is an essential part of the information system, as users, developers, administrators, and other personnel engage with the system to input, retrieve, and interpret information. The collaborative interaction between these components ensures the system's effectiveness in enhancing organizational efficiency,

communication, and strategic planning[6]. In essence, an information system serves as a cohesive and integrated solution for managing data resources and supporting the diverse information needs of modern enterprises.

2. Website

A website is a digital platform accessible on the internet that provides a collection of web pages containing various types of content. Serving as a virtual storefront or information hub[7], websites are fundamental to the online presence of individuals, businesses, organizations, and virtually every entity in the digital age. The backbone of a website is its underlying code, often written in languages like HTML, CSS, and JavaScript, which instruct browsers on how to render and display the content. Websites can vary widely in complexity and purpose, ranging from simple personal blogs to intricate e-commerce platforms and interactive web applications[8,9].

Key components of a website include web pages that can include text, images, videos, and interactive elements, as well as a navigation structure that allows users to move seamlessly between different sections. Additionally, websites may incorporate databases to dynamically generate content, content management systems (CMS) for easy updates, and various multimedia elements to enhance the user experience[10]. The design and functionality of a website are critical aspects, influencing user engagement and satisfaction. Responsive design, ensuring compatibility with different devices, and accessibility features contribute to a positive user experience.

3. Cake-PHP

Cake-PHP is a robust and open-source web application framework written in PHP, designed to simplify and expedite the process of building web applications. Established on the principles of convention over configuration and the Model-View-Controller (MVC) architectural pattern, Cake-PHP empowers developers to create scalable and maintainable applications with relative ease.

At the heart of Cake-PHP is its convention-based approach, which means that developers can adhere to a set of predefined conventions, minimizing the need for explicit configuration[11]. This promotes rapid development by allowing programmers to focus on the specific aspects of their application rather than spending extensive time on configuration details.

The MVC architecture, a core concept in Cake-PHP, divides the application into

three interconnected components:

a. Model: Manages the data and business logic of the application, interacting with the database and handling data manipulation.
b. View: Handles the presentation and user interface of the application, responsible for rendering data and receiving user input.
c. Controller: Acts as an intermediary between the Model and View, processing user input, invoking the corresponding Model logic, and updating the View accordingly.

Cake-PHP incorporates an integrated ORM (Object-Relational Mapping) system, simplifying database interactions and ensuring a smooth data flow between the application and the database[3]. This enhances database security and facilitates efficient data manipulation without requiring intricate SQL queries.

Moreover, Cake-PHP supports the creation of reusable code components called "Helpers" and "Components," promoting modularity and code reusability. The framework also provides built-in features for handling tasks like form validation, session management, and security, contributing to the overall efficiency and security of web applications. Cake-PHP stands as a powerful framework for developers seeking a balance between convention-driven development, MVC architecture, and a comprehensive set of features[11], allowing them to build robust, scalable, and maintainable web applications with efficiency and speed.

RESULTS AND DISCUSSION

The planning of the system is intended as a follow-up to address the issues; therefore, a system design is created. System design is a phase that is useful for improving work efficiency in the alumni data processing information system. This design also takes the form of a layout on the website to be built and determines the model used in the website development. System design is also included in UML (Unified Modeling Language) design, which itself consists of Use Case Diagrams, Activity Diagrams, and Class Diagrams that represent how the system users will interact and the data requirements for the alumni data processing information system users.

1. Use Case Diagram

The Use Case Diagram is an illustration of the functions of a system from the user's perspective. This diagram works by explaining the interaction relationships between the

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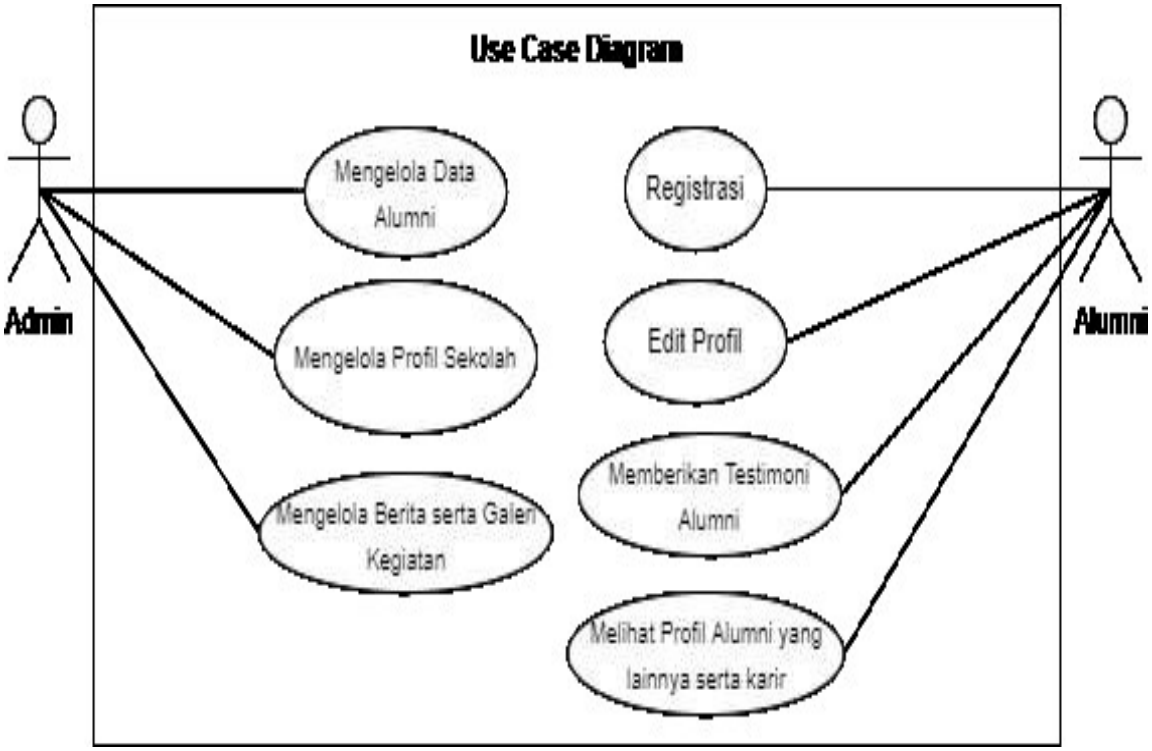
user and the system in operation.



Picture 1. *Use Case Diagram*

2. Activity Diagram

The Activity Diagram illustrates the workflow of each activity and explains the procedures that users will undertake in utilizing the system. The following will depict each activity diagram in the Alumni Data Processing Information System Activity Diagram Login Admin

a. Activity diagram admin

Admin can log in by opening the admin login page; The system will display a login form specifically designed for admins. The admin can then fill in the form with the username and password. If correct, the system will display the admin dashboard page; If it is wrong, the system will display the login form again.

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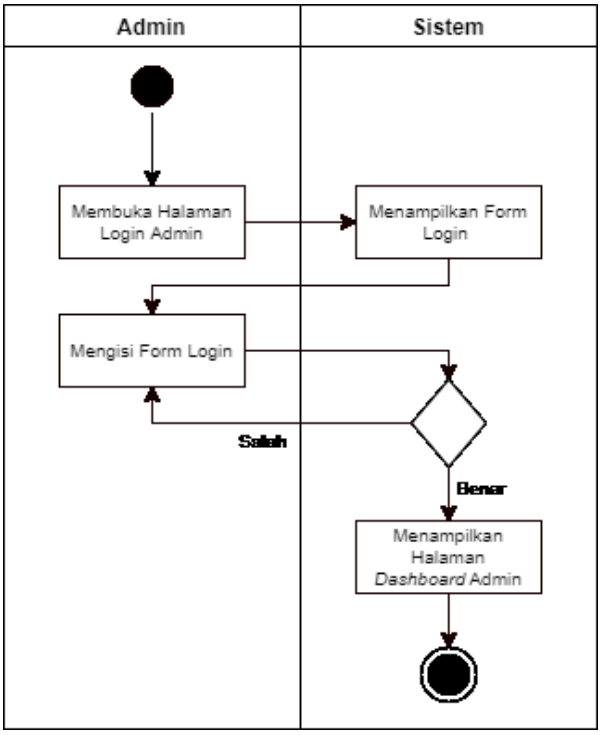
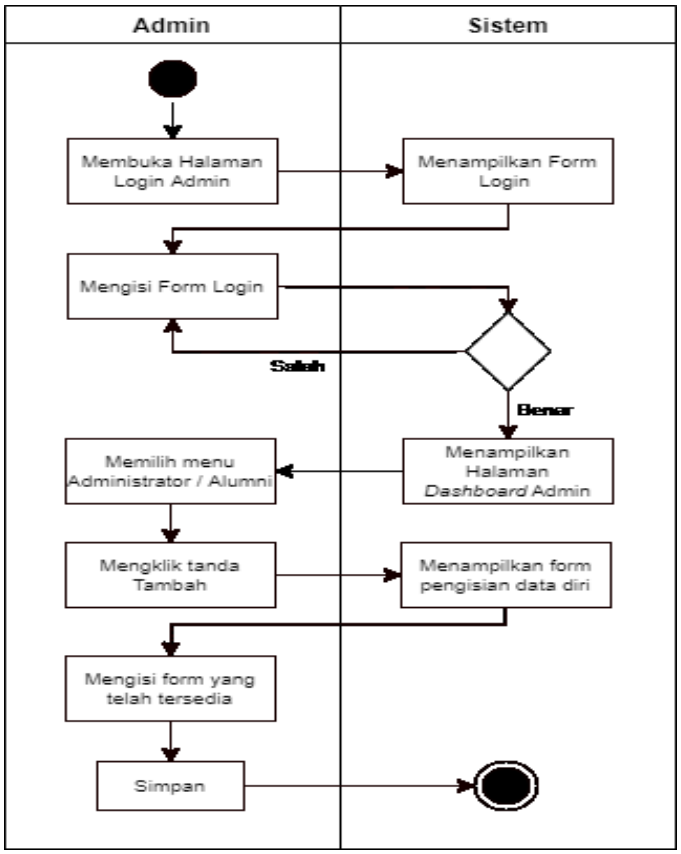


Picture 2. *Activity Diagram Login* Admin

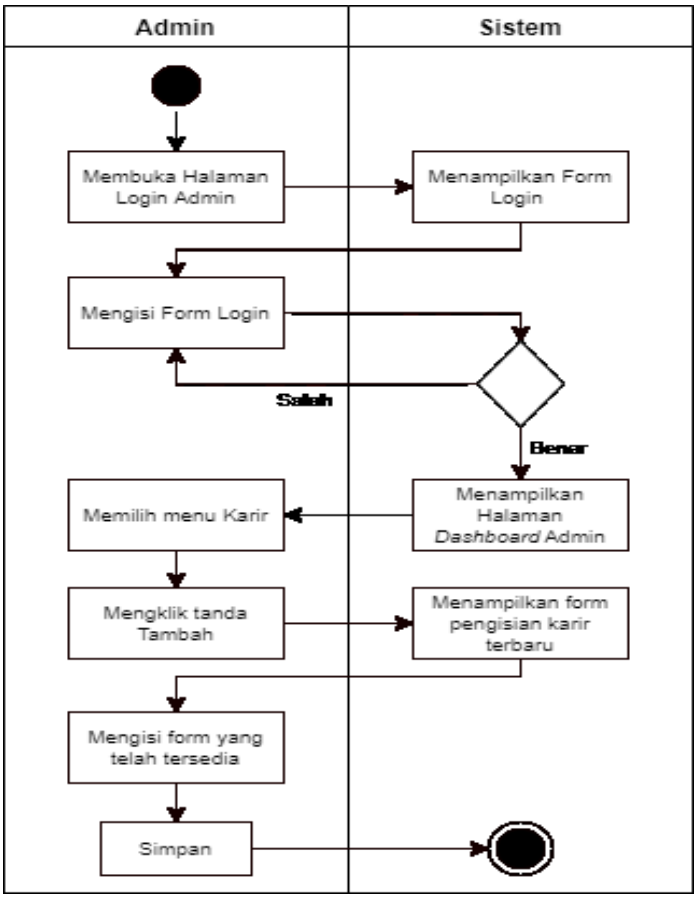
b. Activity *Diagram* Admin Tambah Data Pengguna



Picture 3. *Admin Activity Diagram Add User Data*

c. *Activity Diagram* Career Management

Admins can manage careers on the system. Careers usefully publishes job vacancies and alumni can see what job vacancies suit them. Admin can change or add the latest vacancies on the admin page. On the admin page there is a career menu, then to add an admin you can click the plus sign on that page, the system will display a form for filling in job vacancies, after filling in the admin can click save, so that job vacancies are published directly on the main page.



Picture 4. Career Management Activity Diagram

d. *Activity Diagram* Alumni Registration

Alumni are required to register if they don't have an account by clicking the login/registration sign, then the system will display a login form first. On the login display, registration is written, where alumni can click on the text. Then alumni can fill in the form which consists of username, password, etc. After that, alumni can click register and later the registered account can be used to carry out activities on the main page such as providing alumni testimonials.

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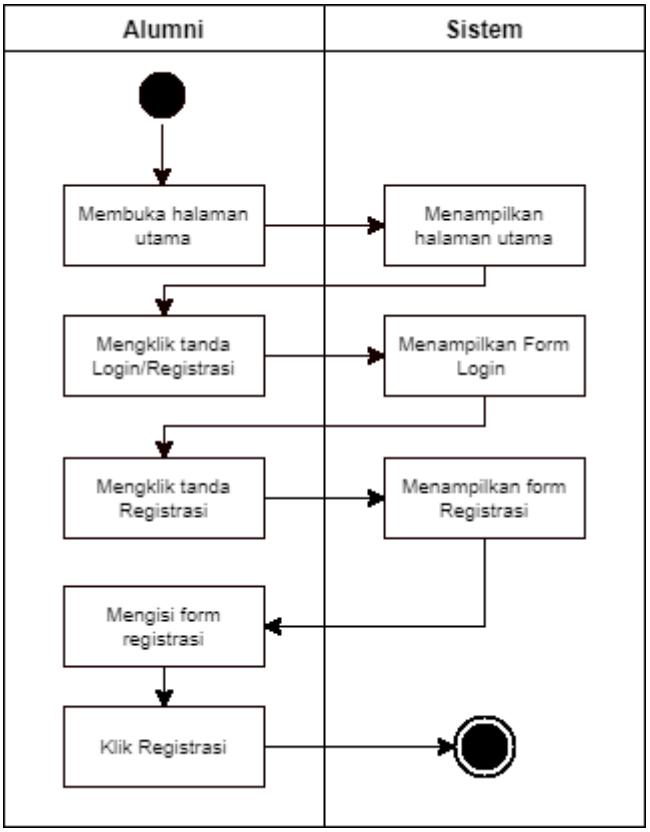

Picture 5. Alumni Registration *Activity Diagram*

3. Class Diagram

Class Diagram is a description of a database table and relationships that the author has designed to store data that has been input into the alumni data information system.

Picture 6. *Class Diagram*

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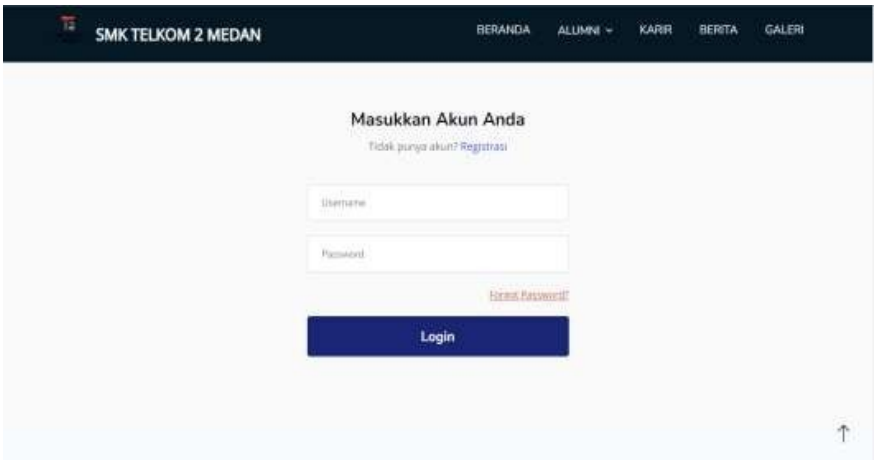
Program Display Results

The result of the program display is a display that has been designed and can be run. The display will be taken via a screenshot of the program that has been run. The following are the results of the Telkom 2 Medan Vocational School alumni data information system display.

1. Alumni Login Display Results

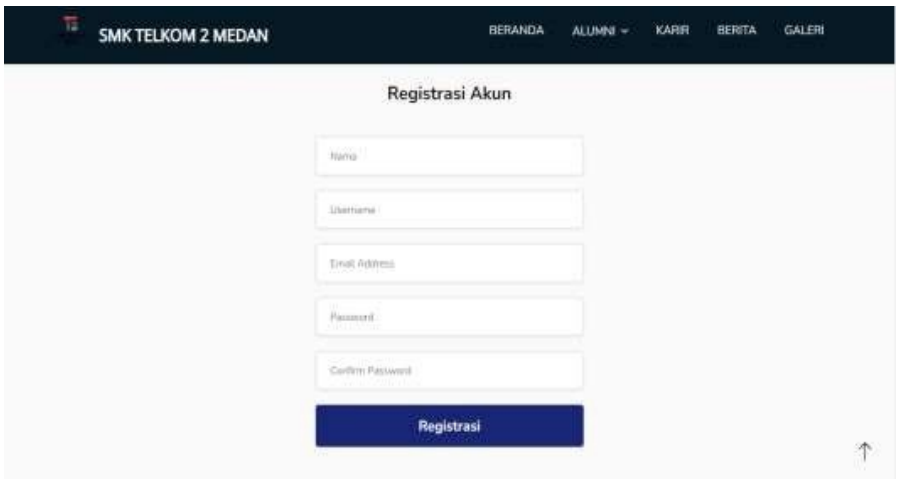
Picture 7 is the alumni login display, here there is a username and password form for inputting registered alumni accounts, and there is registration writing which can be clicked and then go to the registration page.



Picture 7. Alumni Login Display Results

2. Alumni Registration Display Results

Figure 8 is the alumni registration display for registering if alumni do not yet have an account. After registration, alumni can provide their testimonials.



Picture 8. Alumni Registration Display Result

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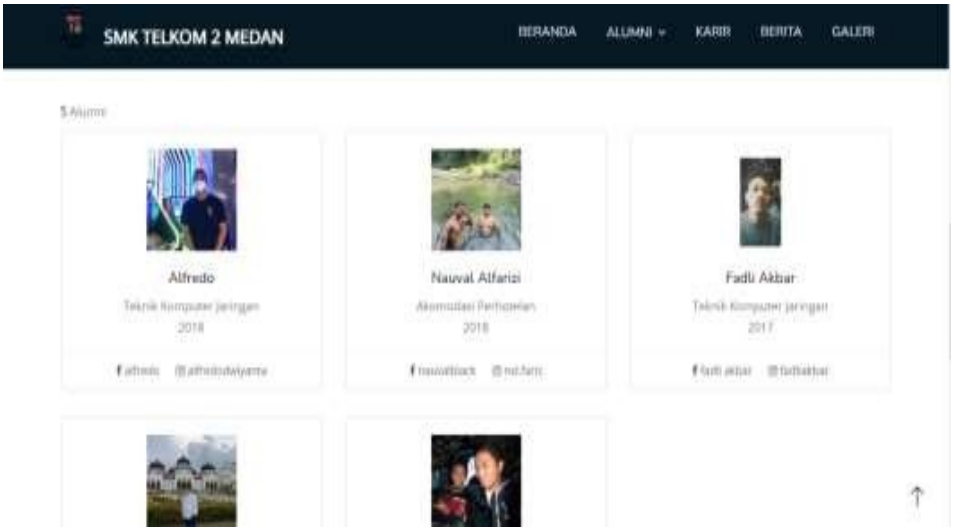
3. Alumni Profile Display Results

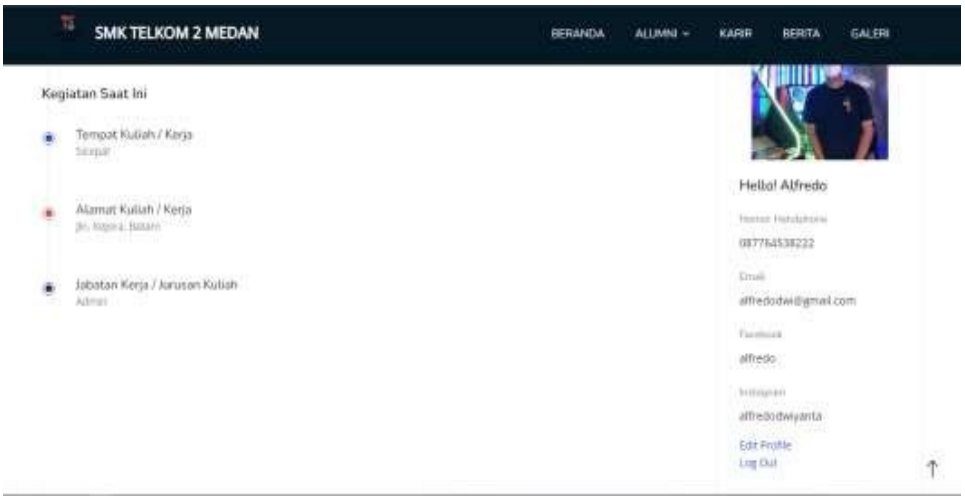
Is an alumni profile display that can be accessed when alumni have logged in. On this page there are several alumni registered in the system.



Picture 9. Alumni Profile Display Results

4. Alumni Details Display Results

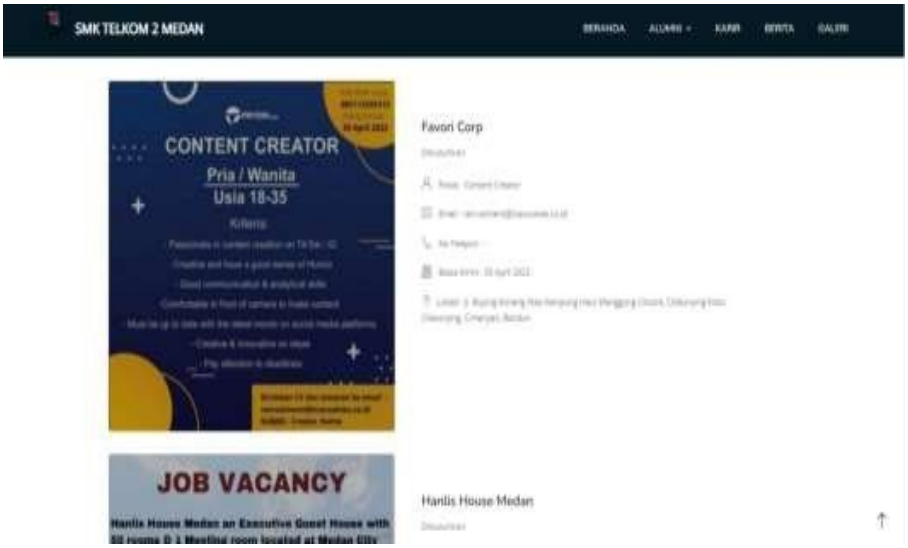
Alumni detail display which can be seen by clicking on the alumni account, there is some detailed information in it.



Picture 10. Alumni Details Display Results

5. Career Page View Results

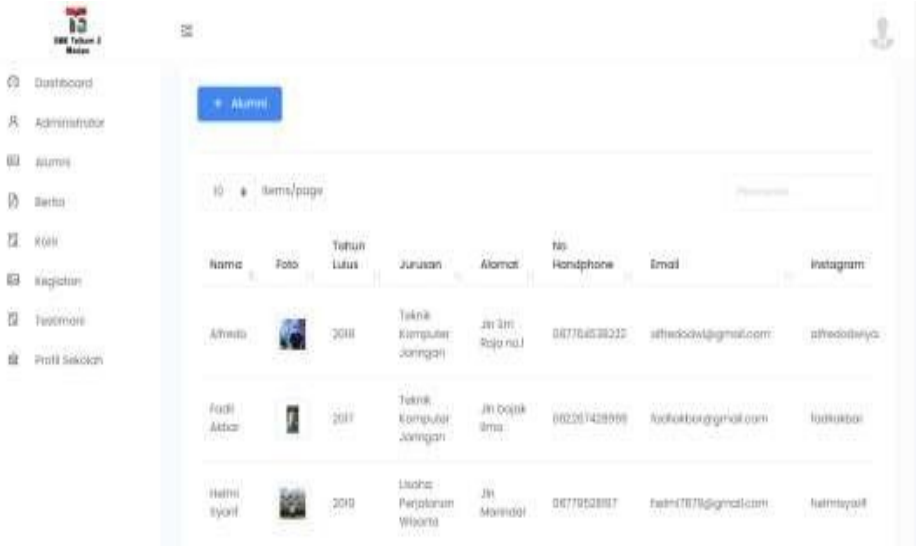
Displays the career page containing job vacancies that have been added by the admin for alumni who visit the system.



Picture 11. Career Page View Results

6. Alumni Menu Display Results

Alumni menu display which is useful for adding the latest alumni and displaying the names of registered alumni.



Picture 12. Alumni Menu Display Results

7. News Menu Display Results

Figure 13 is the News menu display which is useful for adding the latest news and displaying some of the news that has been added.

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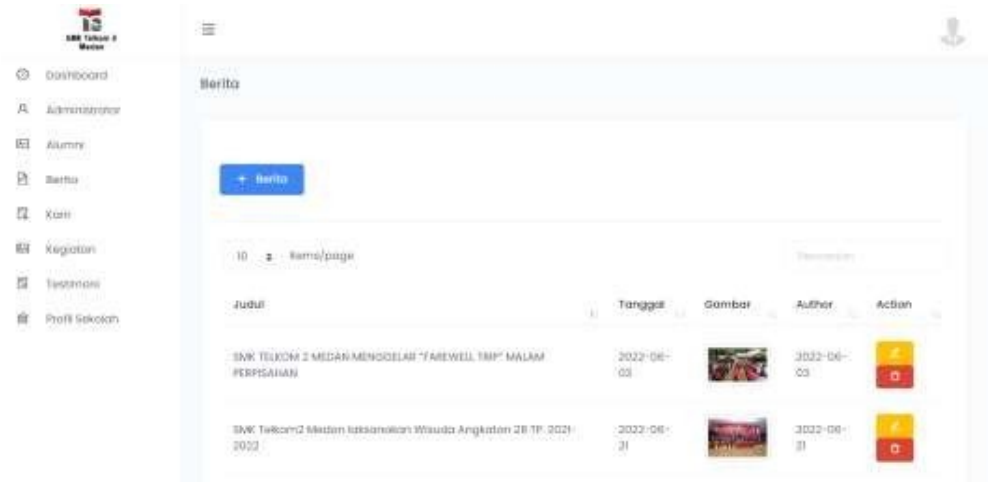
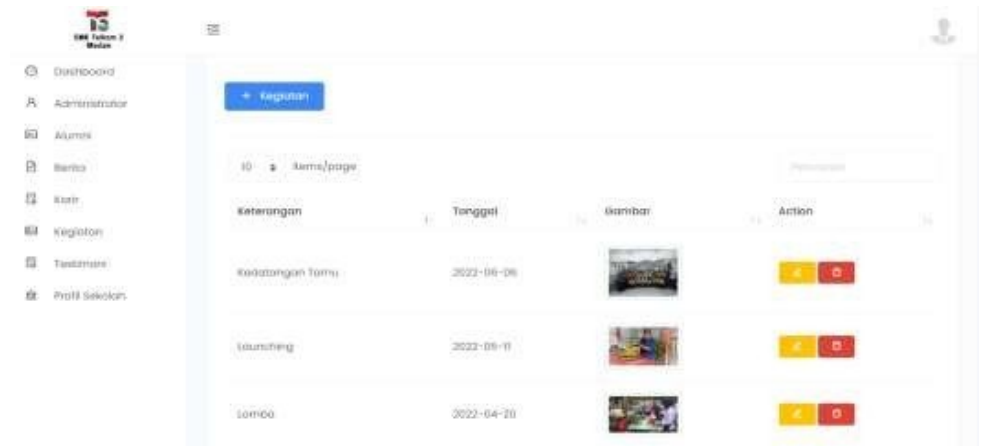


Picture 13. News Menu Display Results

8. Activity Menu Display Results

Activities menu which is useful for adding the latest activities as well as displaying several activities that have been added.



Picture 14. Activity Menu Display Results

CONCLUSION

In conclusion, the development of an Information System for Alumni Data Processing using the CakePHP framework marks a significant advancement in enhancing the management and utilization of alumni information within educational institutions. The utilization of CakePHP, renowned for its rapid development capabilities and adherence to the Model-View-Controller (MVC) pattern, has provided a robust foundation for creating a scalable and maintainable system.

The system design encompasses critical elements, including secure database

integration, user authentication, data entry modules, and innovative features such as search and reporting functionalities, and communication tools. These components collectively address the diverse needs of alumni data management, fostering efficiency, accessibility, and security.

The mobile responsiveness of the system ensures adaptability across various devices, reflecting a commitment to meeting the expectations of modern users. By leveraging CakePHP's capabilities, the project aims to streamline data processing workflows, reduce configuration complexities, and provide a user-friendly interface for administrators and end-users alike. Through this development, the project not only addresses the immediate requirements of educational institutions but also contributes valuable insights into the scalability and sustainability of information systems. In the broader context of educational technology, the Information System for Alumni Data Processing is positioned to have a positive impact on alumni engagement, communication, and overall data management practices.

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