Development of a Web-Based Alumni Information System at Universitas Hindu Indonesia

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Abstract: The development of ASTAIKAMAHI, an Alumni Information System based on a Website is an effective solution in managing information and data regarding an institution's alumni. Issues related to non-systemic and manual information dissemination, as well as challenges in gathering alumni data, are expected to be resolved by this system. It is anticipated that this system will facilitate alumni in connecting and interacting. The aim of this research is to develop an effective and efficient alumni information system to enhance alumni engagement and participation in institutional activities. The research follows a waterfall model involving various stages, starting from needs analysis, design, implementation, testing, to maintenance. The developed alumni information system includes features such as alumni profiles, current news and information, job vacancies, and alumni activities. This system is implemented in the form of a website using the CodeIgniter framework. Testing results using black box testing indicate that this system effectively manages various data and information crucial for alumni. Alumni using this system can easily access and update their profile information, as well as connect with fellow alumni and the institution. For future research, it is hoped that a more flexible information system can be developed, perhaps in the form of a mobile-based application.

Keywords: Alumni, Website, Information System, CodeIgniter, Waterfall

INTRODUCTION

Higher education is one of the most crucial investments that an individual can make in their life. Upon completing their education, graduates must seek employment or pursue further studies. Therefore, it is imperative for universities to build relationships with alumni and assist them in building their careers. Currently, information technology is advancing rapidly, and universities must leverage it to strengthen relationships with alumni (Wahyuddin et al., 2021). Universitas Hindu Indonesia, as one of the private universities in Bali, should also be able to harness technology to stay connected, especially with alumni (Astawa et al., 2022). One way to achieve this is by developing a web-based alumni information system. With this system, universities can provide better services to alumni and gather data about them for academic and administrative purposes.

A web-based alumni information system offers numerous benefits for both universities and alumni (Belipati & Nay, 2021). Alumni can access information about reunions, job opportunities, scholarships, and other events (Hamid et al., 2021). Universities can collect alumni data for strategic decision-making and human resources management. However, at present, Universitas Hindu Indonesia does not have an adequate alumni information system. Many systems still use print or manual formats, making it difficult to collect data and provide sufficient services to alumni. Therefore, research on the development of a web-based alumni information system is crucial. This research will assist universities in creating a better and more adequate alumni information system.

The system in this research was developed in a website-based system using various combinations of programming languages such as HTML, PHP, CSS and stored in a MySQL database using a system development framework, namely Laravel, which is a good combination for creating website-based software (Mahendra, 2023). The research model used in this study is the waterfall model. In the waterfall model, each stage of the system development process is executed sequentially, starting with planning, needs analysis, design, implementation, testing, and maintenance (Indrawan et al., 2022; Putra et al., 2022). Each stage must be completed and verified before entering the next stage. The advantages of this model lie in its simplicity and ease of understanding. It also emphasizes strong documentation, making it easier for the development team to manage and monitor the system

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development process (Duckett, 2011). Furthermore, system development using this method can produce consistent and reliable products because each stage is tested and verified before moving on to the next.

Therefore, the development of a web-based alumni information system is crucial for both universities and alumni. This research is expected to make a real contribution to developing a better and more adequate alumni information system. With an effective and efficient alumni information system, universities can provide better services to alumni and strengthen their relationships with them. Additionally, a well-integrated alumni information system can assist universities in strategic decision-making and human resources management.

LITERATURE REVIEW

In the realm of higher education, the imperative to establish and maintain effective communication with alumni has become increasingly pronounced (Tanis, 2020). As universities recognize the pivotal role of alumni in contributing to institutional success, the integration of modern technology, particularly web-based alumni information systems, has emerged as a crucial avenue for fostering and sustaining these connections. The development of alumni information systems, especially those based on web platforms, has gained traction across various academic institutions worldwide. Research indicates that such systems play a pivotal role in enhancing alumni engagement, facilitating seamless communication, and providing valuable services to graduates as they navigate their post-academic endeavors.

A study by Smith in 2018, highlighted the significance of web-based alumni information systems in streamlining the dissemination of information regarding reunions, networking events, and career opportunities (Habib et al., 2021). The findings underscored the positive impact of these systems on alumni involvement and their ability to stay connected with the alma mater. Furthermore, the research conducted by Brown and Jones in 2019 shed light on the importance of alumni information systems for universities in making informed decisions (Jokhan et al., 2022). The study emphasized how the data collected through these systems contributes to strategic planning, resource allocation, and effective management of human resources within academic institutions. However, despite the evident advantages, it is observed that many universities, including Universitas Hindu Indonesia, are yet to fully capitalize on the potential of web-based alumni information systems. Limited research has been conducted specifically on the development of such systems in the context of Indonesian universities. The conceptual framework for this research draws inspiration from the success of the waterfall model, as demonstrated by Wilson and Chang in 2020, about system development methodologies (Arridha et al., 2022). The sequential nature of the waterfall model, encompassing planning, needs analysis, design, implementation, testing, and maintenance, aligns with the systematic approach required for the development of a comprehensive web-based alumni information system (Asmarajaya et al., 2021; Indrawan et al., 2022; Suryadi et al., 2022). This study using black box testing in evaluation (Mahendra & Asmarajaya, 2022).

In conclusion, the literature reviewed underscores the growing significance of web-based alumni information systems in higher education settings globally. While several studies have demonstrated the positive impact of these systems on alumni engagement and institutional decision-making, there remains a gap in the literature concerning their development within the Indonesian context. This research aims to address this gap by focusing on the specific case of Universitas Hindu Indonesia, contributing valuable insights and recommendations for the successful implementation of a web-based alumni information system in the university setting.

METHOD

This research will employ a structured system development methodology, with the waterfall model serving as the primary framework. The following is a summary of the methodological stages to be applied in this research:

Requirements: This stage will focus on the initial planning of the development of the alumni information system. Steps include identifying stakeholder needs, setting objectives, and designing implementation strategies. Subsequently, an in-depth needs analysis will be conducted to understand the requirements and expectations of system users, both from the university and alumni perspectives. This involves interviews, surveys, and a review of related literature. From this stage, the researcher gets detailed information to build the system such as analysis of required systems, user specifications and functional and non-functional requirements.

Design: Once the needs are analyzed, the design of the web-based alumni information system will take place. This includes the design of the user interface, database structure, and the overall architecture of the system. From this stage, the researcher gets design for the appropriate system.

Implementation: The real development of the system based on the designed specifications will follow. The development team will implement the structure and features designed using appropriate web technologies. From this stage, the researcher gets the system that can be used by user.

Verification: The implemented system will undergo a series of testing to ensure optimal functionality, alignment with requirements, and identification and correction of potential bugs. From this stage, the researcher gets testing result.

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Maintenance: After the system is implemented and tested, the maintenance stage will ensure that the system continues to operate smoothly. Updates or corrections will be made as needed after the system has been fully operational.
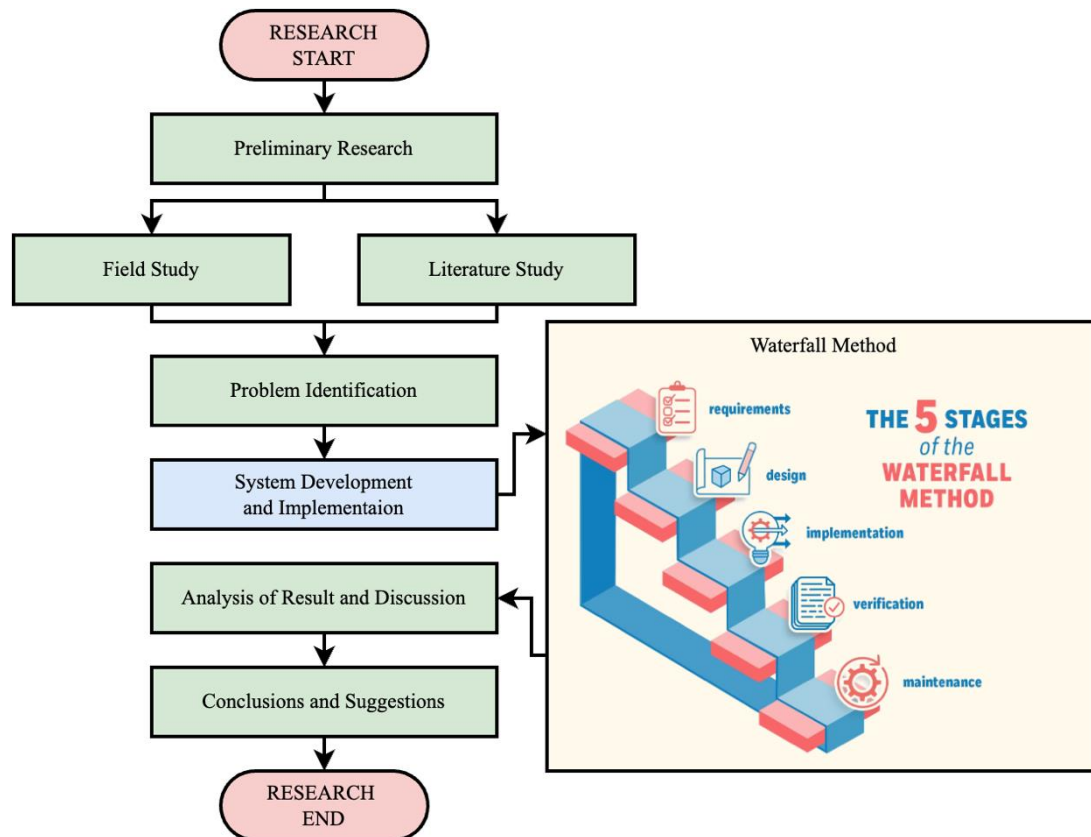

Fig. 1 Research Methodology Integerated with Waterfall Model

This methodology was chosen for its clarity in outlining the steps, aligning with the structured nature of system development. The waterfall model ensures each stage is completed and verified before moving to the next, minimizing the risk of errors or deficiencies in the development of the web-based alumni information system at Universitas Hindu Indonesia.

RESULT

This research has successfully created a web-based alumni information system named "ASTAIKAMAHI." ASTAIKAMAHI is a website that provides services for alumni and facilitates the search for information related to alumni, serving as a platform to gather alumni. The platform is structured into three main sections, including the main site for alumni and the admin dashboard. On the main page for alumni, users can engage in activities such as logging in and viewing a list of services, including job openings and event information. In the admin dashboard, the administrator has access to view the list of alumni, manage user data, and update news and event data. The admin also has the authority to create, delete, and update data in the database through the admin dashboard.

The homepage is the initial display seen by visitors to the alumni website. On the homepage, there are several menus provided, ranging from alumni data, job market, activities, and about the application. Visitors can see a simple layout on the main page, ensuring ease of use without complicating the experience for users. The results of the homepage implementation are shown in Figure 2. This system was developed in Bahasa Indonesia, so the screenshots are displayed in Bahasa Indonesia.

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Fig. 2. Homepage

The login page is a display for visitors who are registered as alumni. After alumni successfully log in, the alumni dashboard page will be displayed. The alumni dashboard page displays menus that can be accessed by alumni. Starting from the home menu, user profile, vacancies, events, testimonials, as well as criticism and suggestions, the alumni profile page displays information about the identity of the alumni. The vacancies page displays information about the list of vacancies. The events page displays a list of existing events. The results of the alumni dashboard page implementation are shown in Figure 3.
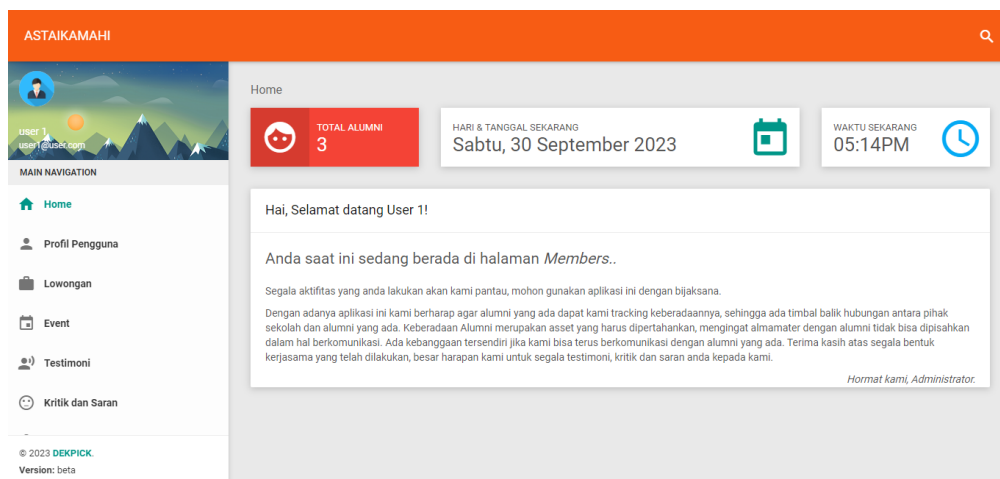

Fig. 3. Alumni Dashboard Page

Apart from alumni, there are also admins who can log into the system. If the admin successfully logs in, the admin dashboard page will appear. The Admin User page displays a list of users as well as adding, changing, and deleting users. The vacancy admin page displays a list of vacancies as well as adding, editing, and deleting vacancy lists. The event admin page displays a list of events as well as adding, editing, and deleting event lists. The alumni recapitulation admin page displays the alumni recapitulation list as well as adding, editing, and deleting the alumni recapitulation list. The results of the admin dashboard page implementation are shown in Figure 4, and the results of the recapitulation of alumni data page implementation are shown in Figure 5.
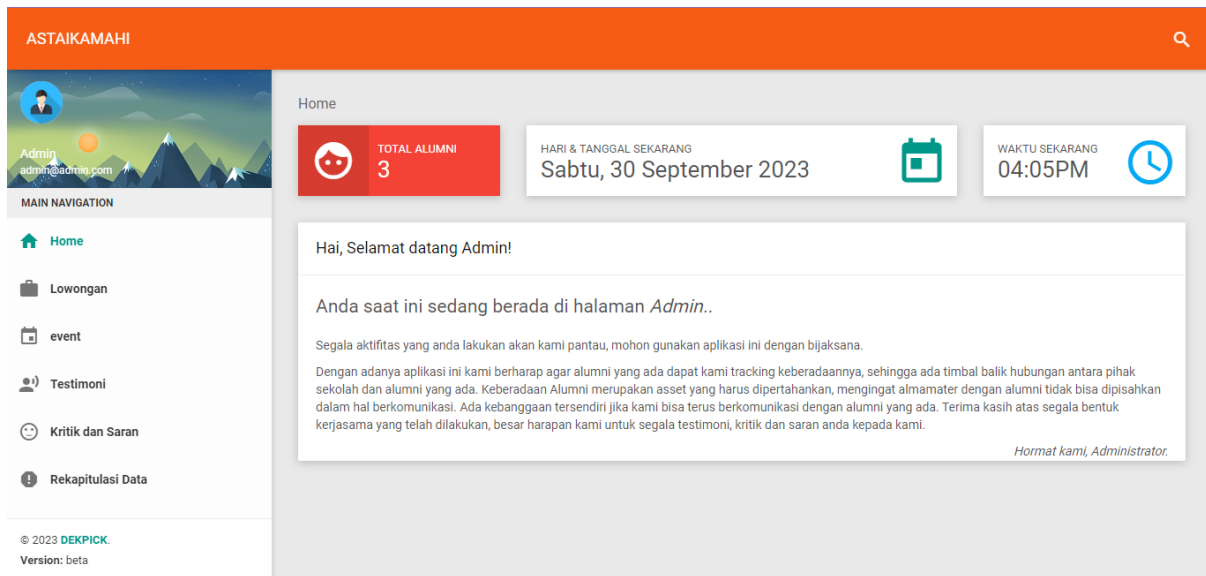
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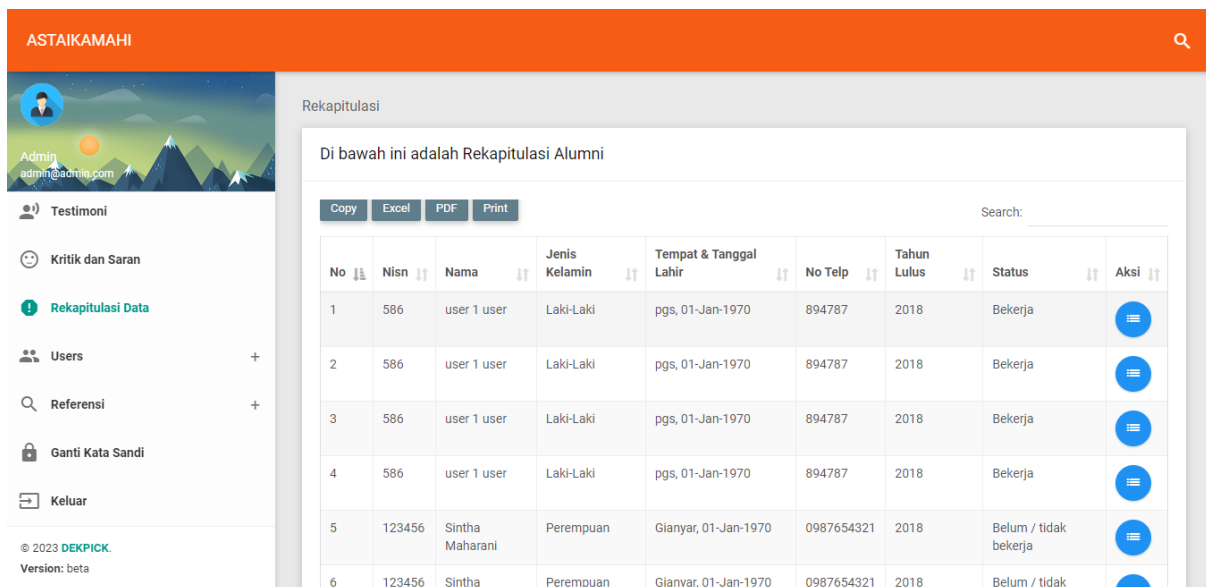
Fig. 4. Admin Dashboard Page

Fig. 5. Alumni Data Recap Page

Once all website services have been developed, the subsequent stage involves testing. The testing procedure employs the black-box testing method. black box testing on the website-based alumni information system at Universitas Hindu Indonesia by testing all website pages along with all the functions contained therein. Testing is carried out to ensure all functions work properly. Testing is carried out on all pages, both alumni pages and pages accessed by the admin. Following are the results of the black box testing carried out, as shown in Table 1 for pages accessed by alumni and Table 2 for pages accessed by administrators.

Table 1 Black Box Testing Result for Alumni Pages (General User)

No	Function	Statement	Result	
			Yes	No
1	Account			
	a. Log in as an alumni user	The login function as an alumni user has worked correctly	√	
	b. Viewing alumni user profile	The function to view profiles is functioning correctly	√	
	c. Editing alumni user profile	The function to edit profiles is functioning correctly	√	

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No	Function	Statement	Result Yes	Result No
	d. Changing alumni user password	The function to change passwords is functioning correctly	√	
	e. Logout	The logout function is functioning correctly	√	
2	Alumni user registration	The registration function has worked correctly	√	
3	Alumni	Function to view and search alumni data is working correctly	√	
4	Alumni Information	Function to view topics, write and search for information is working correctly	√	
5	News	Function to view and search news data is working correctly	√	
6	Agenda	Function to view and search agenda data is working correctly	√	

Table 2 Black Box Testing Result for Admin Pages

No	Function	Statement	Result Yes	Result No
1	Account			
	a. Login as an administrator	The login function as an administrator has worked correctly	√	
	b. Viewing administrator profile	The function to view the administrator's profile is functioning correctly	√	
	c. Editing administrator profile	The function to edit the administrator's profile is functioning correctly	√	
	d. Changing administrator password	The function to change the administrator's password is functioning correctly	√	
	e. Logout	The logout function is functioning correctly	√	
2	Managing Alumni	Data The function to add, edit, delete, and search alumni data is working correctly	√	
3	Managing Information	The function to add, edit, delete, and search information data is working correctly	√	
4	Managing News	The function to add, edit, delete, and search news data is working correctly	√	
5	Managing Agenda	The function to add, edit, delete, and search agenda data is working correctly	√	
6	Managing Admin	The function to add, edit, delete, and view admin data is working correctly	√	
7	Managing Posts	The function to manage news, agenda, and information written by users is working correctly	√	

DISCUSSIONS

The development of the Alumni Information System at Universitas Hindu Indonesia through a website has yielded noteworthy insights and implications. One key aspect is the enhancement of communication and engagement between the university and its alumni. The implementation of a web-based system allows for efficient information dissemination, creating a more interconnected and dynamic relationship. The utilization of a structured development model, specifically the waterfall model, has proven beneficial in ensuring a systematic and sequential approach to the system's creation. Each stage, from planning to maintenance, was executed with precision, emphasizing the importance of thorough documentation. The simplicity and ease of understanding associated with the waterfall model contributed to its successful application in this context. The identified benefits of the web-based alumni information system are significant. Alumni can access a variety of services, including reunion information, job opportunities, scholarships, and other events. This accessibility not only serves the alumni but also allows the university to collect valuable data for strategic decision-making and human resource management. However, the research sheds light on the current deficiency at Universitas Hindu Indonesia concerning the absence of an adequate alumni information system. Many existing systems rely on outdated print or manual formats, posing challenges in data collection and service provision to alumni. This emphasizes the urgency of developing a web-based alumni information system to meet the evolving needs of both the university and its alumni. The chosen waterfall model, while celebrated for its simplicity and documentation emphasis, does have limitations. The linear progression may encounter challenges in adapting to unforeseen changes or evolving requirements. Future research could explore more agile methodologies to address these potential limitations and enhance flexibility during the system development process. And then, the research on the development of a web-based alumni information

system at Universitas Hindu Indonesia serves as a crucial step towards modernizing communication channels and alumni services. The identified benefits, coupled with the acknowledgment of existing shortcomings, provide a foundation for continuous improvement and development. The integration of technology into alumni relations is imperative for fostering stronger connections and leveraging alumni contributions for the university's growth and success.

CONCLUSION

The development of ASTAIKAMAHI, the Alumni Information System based on a website at Universitas Hindu Indonesia signifies a pivotal advancement in fostering stronger connections with alumni. The integration of a web-based system has not only addressed communication challenges but has also provided alumni with enhanced accessibility to valuable services and information. While the chosen waterfall development model demonstrated effectiveness in its systematic approach, future research may explore more flexible methodologies to accommodate evolving needs. The identified shortcomings in the current system emphasize the urgency of implementing a more efficient and responsive alumni information system. Overall, this research lays the foundation for continuous innovation, offering potential for further technological advancements to continually enhance alumni engagement and support at Universitas Hindu Indonesia.

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