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Implementing Website-Based School Information Systems in Public Elementary Schools Using Waterfall Model

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Abstract

This research focuses on implementing a web-based school information system at SDN 14 Pontianak City, a renowned public elementary school with a rich historical background. The study aims to address challenges related to ineffective internal information delivery within the school. Currently, reliance on group chats for school-related activities poses obstacles in efficiently disseminating crucial information, including new student registration, extracurricular activities, competition achievements, vision and mission statements, and important updates. To overcome these challenges, a website-based school information system is proposed. It aims to seamlessly deliver essential school-related information to a wider audience, including parents and prospective parents. The system ensures easy access to information that was previously confined to the school's internal environment. The research employs the structured development process of the waterfall model, utilizing context diagrams, data flow diagrams (DFD), and entity relation diagrams (ERD) for a well-defined system design. Rigorous testing using the black box approach ensures website functionality and reliability. Implementation of this web-based school information system is expected to substantially improve information dissemination, benefiting the entire school community by providing convenient access to vital information for parents and prospective parents. This improvement will foster enhanced communication and engagement within the school ecosystem.

Keywords: Information System, HIS, SDN 14 Pontianak, Information, Waterfall,

1. INTRODUCTION

Education encompasses three dimensions: the individual, the society or national community, and the comprehensive aspects of reality, encompassing both material and spiritual elements that shape human beings and society [1]. Basic education plays a crucial role in cultivating a nation characterized by enthusiasm, pride, creativity, individuality, courtesy, and the ability to address environmental challenges [2]. It specifically targets children between the ages of 7 and 13 and is tailored to local educational units, leveraging regional potential and socio-cultural

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contexts [2]. Education, fundamentally, is a process that empowers individuals to adapt to change. It is an essential societal and national requirement. The progress or decline of a nation is closely tied to the creativity of its education system, and the complexities of life demand capable and competent human resources [3]. Moreover, education serves as a platform for nurturing high-quality human resources. As stated in Article 20 of the 2003 Constitution, education is a conscious and planned effort to create a learning environment and processes that enable students to actively develop their potential, encompassing religious and spiritual strength, personal growth, self-control, intelligence, noble character, and skills necessary for themselves, society, nation, and state [4]. The primary objective of basic education is to equip individuals with essential intelligence, knowledge, personality, noble character, and life skills for independent living and further education. Furthermore, basic education fosters the ability to function effectively within a community [1]-[4].

SD Negeri 14 Pontianak City, situated at Jl. Tamar, Central, Kec. Pontianak City, Pontianak City, West Kalimantan, holds historical significance. It was established in 1902 by the Dutch East Indies Government as a Volkschool or public school. Initially known as Hollandsch Inlandsche School (HIS), it is now 120 years old. SD Negeri 14 Pontianak City offers various information required by the community, parents, and prospective parents seeking to enroll their children. However, there are challenges associated with disseminating information to a broader audience, specifically parents and prospective parents, indicating suboptimal information optimization within the school. Currently, school announcements, teacher information, and school activities, including extracurriculars, are exclusively communicated through internal school chat groups on WhatsApp. The school needs to address this challenge and optimize information dissemination. In an era of rapid technological advancements, various fields demand progress and development.

Information technology is a field intricately linked to the advancements in modern technology [5]. Its primary function is to process, organize, retrieve, store, and transform data into valuable and high-quality information through various means [6]-[8]. Additionally, information technology plays a pivotal role in problem-solving, fostering creativity, enhancing effectiveness, and improving efficiency in human activities. In essence, it encompasses a range of hardware and software tools aimed at swiftly delivering quality information to the community. Website technology is an innovative approach that facilitates the efficient dissemination of information, a natural consequence of the advancements in information and communication technology on the internet [9]-[11].

The era of globalization introduces new challenges that necessitate transformative approaches to education. To respond to these global changes, education requires a revised vision and strategy to equip Indonesian individuals with the ability to

address global challenges and seize opportunities [3]. Globalization, as a form of social change, promotes accessibility on a broad scale. The development of science, technology, and the economy are key factors contributing to globalization. Considering the challenges highlighted in the background, employing website-based information technology at SD Negeri 14 Pontianak City is proposed as a solution. The website aims to effectively provide necessary information about the school to the general public, including parents and prospective parents, ensuring easy accessibility. The motivation behind the website's creation is the desire to offer comprehensive and accurate information, as well as efficient services. Competing in the education sector and leveraging new information technology necessitate SD Negeri 14 Pontianak City to formulate the right strategies. This motivation led the author to conduct a study on the information system, specifically focusing on designing a website at SD Negeri 14 Pontianak City using the black box testing method.

2. METHODS

The methodology used to achieve the objectives of the problem above consists of 5 stages which refer to the system development life cycle, namely the waterfall method. Where each stage is carried out systematically according to the figure below [12], [13].

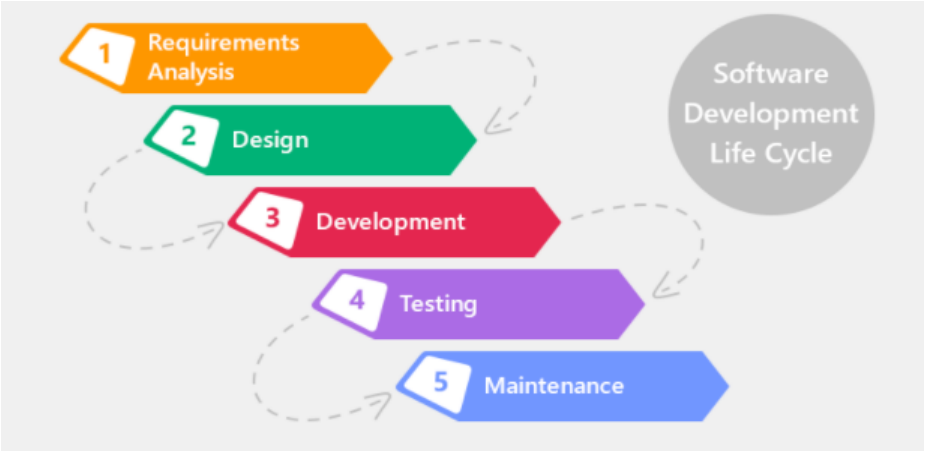

Figure 1. Waterfall

Figure 1 illustrates the various phases involved in the development of a school information system for public schools in Pontianak City. These phases encompass the initial needs analysis, followed by development, design, implementation, testing, and system maintenance. However, the focus of this study centers solely on the testing phase, leaving the subsequent phases beyond the scope of discussion.

2.1. Requirements Analysis

The initial stage of the process, known as user needs analysis or requirement analysis, focuses on identifying the specific needs of the end users. This crucial process involves effective communication between the developer and the stakeholders to determine the requirements that must be fulfilled. These requirements include factors such as the devices to be used, desired features, and other software-related aspects. Before proceeding with website design, it is essential to undergo the following stages of data collection:

a) Literature Review: This stage involves gathering relevant literature from sources such as books, journals, notes, and the internet. The literature serves as a valuable reference in reviewing research materials and acquiring relevant knowledge.
b) Interviews: Conducting interviews with relevant parties is an important method for collecting essential data. Through well-crafted questions, the interviews aim to gather insightful information that contributes to the project.
c) Observation: Data collection is also achieved through direct observation, which involves carefully observing and documenting the situations and conditions in the field.

These data collection stages lay the foundation for informed decision-making during the website design process. They ensure that the website development aligns with the identified needs and requirements of the end users.

2.2. Design

The design stage follows the needs analysis and focuses on creating a model based on the identified requirements determined during the analysis phase. This modeling process involves the utilization of various tools, including context diagrams, data flow diagrams, and entity relationship diagrams [14]–[16]. These tools serve as essential components in visually representing the structure and relationships within the system. By employing these modeling techniques, the design stage aims to establish a clear and comprehensive blueprint that guides the subsequent development and implementation phases of the project.

2.3. Development

This project involves the development of a website design for SD Negeri 14 Pontianak City. The implementation of the database utilizes MySQL, while the programming languages employed are PHP and HTML. The XAMPP web server serves as the local hosting environment for the website. The aim of this effort is to construct an application that effectively addresses the specific needs of SD Negeri 14 Pontianak City and provides a functional and user-friendly website design.

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2.4. Testing

Black box testing is a critical stage in the software development process aimed at ensuring the smoothness and reliability of the program that has been created. This testing phase is essential to identify and rectify any errors or flaws in the program flow [13], [17]–[19]. Black box testing primarily focuses on the functional specifications of the software, employing a collection of input conditions to perform comprehensive functional testing of the program [19]. By conducting thorough black box testing, developers can verify that the program functions as intended, meets the specified requirements, and operates smoothly without any unexpected issues.

2.5. Maintenance

Maintenance serves as the concluding stage of the project, allowing for an assessment of the extent to which the objectives have been accomplished. During this process, an evaluation or measurement is conducted to compare the planned activities with the achieved results, enabling necessary corrections and improvements to be implemented [20], [21]. At this stage, the website is evaluated in collaboration with stakeholders to determine if it aligns with the expected outcomes. In the event that adjustments are required, they are promptly addressed. Conversely, if the website meets the established criteria and gains acceptance, it is deemed ready for use. Maintenance ensures the ongoing effectiveness and usability of the website, allowing for any necessary updates or enhancements in response to evolving needs and requirements.

3. RESULTS AND DISCUSSION

3.1 Current System Analysis

The existing system at SD Negeri 14 Pontianak Kota for conveying school information, including profiles, important updates, teacher information, and school announcements, currently relies on WhatsApp conversation groups. However, this method of information dissemination is limited to the internal scope of the school, which means that it has not been effectively optimized to reach a wider audience. As a result, the information shared through this system can only be accessed by teachers, staff, students, and parents of students, rather than being widely available to the community or prospective parents who are considering enrolling their children in SD Negeri 14 Pontianak City. Therefore, there is a need for an improved system that enables the school information to be efficiently and accurately accessed by a broader audience.

3.2 New System Analysis

After analyzing the current system, it is evident that there is a need for a website that can effectively communicate various school-related information to both students and the public. This website should serve as a platform for sharing comprehensive details about the school profiles and other crucial updates. Building such a website requires several essential components, including hardware and software infrastructure, as well as a thorough understanding of user needs to ensure optimal usability and functionality. By addressing these factors, the website can fulfill its purpose of providing accessible and relevant information to its users.

3.3 New System Design

Based on the analysis of system requirements, a new system flowchart has been designed to depict the proposed system's workflow, as shown in Figure 2. The flowchart illustrates the various stages and interactions involved in the system, providing a visual representation of how information flows and access rights are categorized. The flowchart serves as a valuable tool for understanding and implementing the proposed system effectively. By following the outlined flowchart, the system can ensure smooth navigation and seamless interaction for both administrators and system visitors, enabling efficient management and access to the desired information.

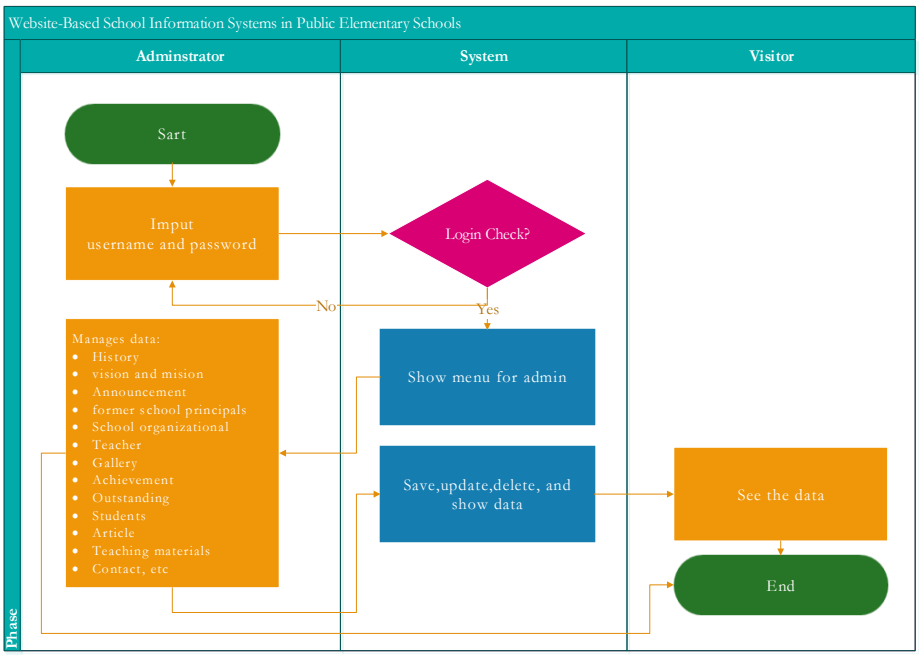

Figure 2. New System Design

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Figure 2 illustrates the proposed system's business process, which encompasses two categories of access rights. The first category is the administrator, who holds the responsibility of comprehensive management of the school information system, including the ability to manipulate data within the system. The administrator plays a crucial role in ensuring the smooth functioning and maintenance of the system. The second category comprises system visitors, who have access rights to absorb all the information provided by the system according to their specific needs. System visitors can access and retrieve relevant information from the system without administrative privileges, enabling them to stay informed about various aspects of the school.

Context diagrams play a crucial role in illustrating the interaction and relationship between a system and its external environment, showcasing the flow of inputs, processes, and outputs [22]. In the context of the SD Negeri 14 Pontianak City website, Figure 3 presents a comprehensive context diagram, providing a high-level overview of how the website interacts with its surrounding environment. The diagram visually represents the connections and interfaces between the website and various external entities such as users, stakeholders, and other systems. It serves as a valuable tool for understanding the system's scope and its interactions with the broader context, facilitating effective system design and development.

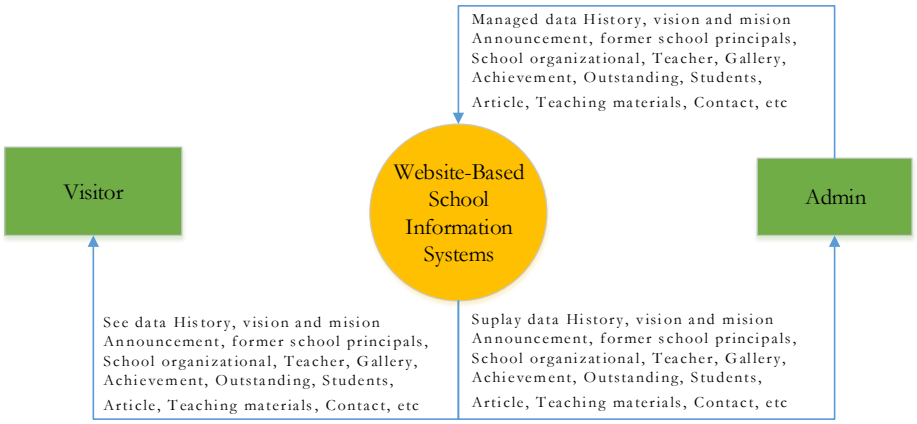

Figure 3. DFD Diagram Context

In Figure 3, the context diagram provides a visual representation of the SD Negeri 14 Pontianak City website and its interactions with external entities [22]. The diagram showcases two key entities: the admin and the visitors. The admin assumes the role of system manager and is responsible for overseeing and managing all the features and functionalities integrated into the website. On the other hand, visitors represent the clients or users of the website who interact with the system to access various services and information. These external entities play distinct roles in the system, with the admin providing administrative functions and

the visitors being the recipients of the services provided by the admin. The context diagram highlights the relationship and communication channels between these entities, providing a clear overview of their interactions within the SD Negeri 14 Pontianak City website ecosystem.

The successful operation of any website relies on well-defined processes that ensure smooth user experience and efficient data management. One such critical process is the login functionality, which acts as the gateway for users to access the website securely. By providing their username and password, users can authenticate their identity, allowing the system to verify their credentials and grant access upon successful confirmation. To maintain accurate historical records, the system incorporates a history management process. This process involves organizing and storing historical data in a structured manner, enabling users to retrieve and access relevant historical information whenever necessary. By ensuring the proper management of historical records, this process supports historical research, reference purposes, and the preservation of institutional knowledge.

The vision and mission of a school play a vital role in shaping its identity and guiding its actions. Therefore, effective management and maintenance of this information are essential. The system's Visi Misi management process focuses on storing, updating, and providing information related to the school's vision and mission statement. By making this crucial information easily accessible to website users, this process enables stakeholders to understand and align with the school's overarching goals. The management of the principal's reception process deals with the data related to the school's principal reception. It involves storing the headmaster's welcome data and the principal's photo data, allowing the website to present valuable information about the principal's welcome message and their corresponding photo. This process enables visitors to the website to familiarize themselves with the principal's role and establish a visual connection, fostering a sense of community and engagement.

Schools regularly communicate important information to students, parents, and staff through announcements. To ensure effective communication, the system incorporates an announcement management process. Authorized personnel can create, update, and publish announcements on the website, promptly informing users about various school-related announcements. This process plays a vital role in keeping stakeholders informed and engaged in the school community. Managing data related to former school principals is crucial for maintaining institutional memory and honoring their contributions. The management of former school principals process involves storing and organizing data about the tenure and roles of former principals. By providing users with valuable insights into the school's past leadership, this process fosters a sense of institutional continuity and appreciation for those who have shaped the school's trajectory.

Efficiently managing the school's organizational structure is essential for effective administration and collaboration. The school organizational management process focuses on storing information about different departments, committees, and roles within the school. By providing users with a comprehensive understanding of the school's organizational hierarchy, this process facilitates effective communication, decision-making, and coordination among various stakeholders. Teachers play a fundamental role in the educational process, and managing their data is crucial for providing accurate and up-to-date information. The teacher management process entails storing and updating information about teacher profiles, qualifications, and other pertinent details. By ensuring the availability of reliable teacher information, this process supports transparency, trust, and effective communication between educators, students, and parents.

Schools often capture memorable moments and events through photos and videos. The system's gallery management process is responsible for organizing and managing data related to the school's gallery. This includes storing and categorizing photos and videos of school events and activities, allowing users to browse and access information about various school-related events. By showcasing the school's vibrant atmosphere, this process promotes engagement and a sense of pride among the school community. Recognizing and celebrating student achievements are essential for motivation and fostering a positive learning environment. The achievement management process involves systematically managing data related to student accomplishments and recognitions. By capturing and recording this information, the process provides users with detailed insights into the achievements of students, inspiring a culture of celebration and motivation.

Outstanding students deserve special recognition for their exceptional accomplishments. The management of outstanding students' data process involves storing information about their achievements and corresponding photos. This process ensures that users can access valuable information. Table 1 provides a comprehensive overview of the proposed processes for the School Information Systems. It outlines the key processes and their respective details, offering a clear understanding of the system's functionalities and operations.

Table 1. The proposed of School Information Systems Process

No	Process Name	Input	Output	Description
1	Login	Username Password	Confirm Login	Process to enter the website

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No	Process Name	Input	Output	Description
2.	History Management	Historical Data	Historical information	Process for managing historical data
3.	vision and mision Management	vision and mision Data	vision and mision information	Process for managing vision and mision data
4.	Management of the principal's reception	Headmaster's welcome data principal's photo data	information on the principal's welcome data Principal photo data info	process for managing principal welcome data and principal photos
5.	Announcement management	Announcement data	Announcement information	Process for managing announcements
6.	Management of former school principals	Data on former principals	Information of former school principals	Process for managing teacher data
7.	School organizational management	School organization data	School organizational information	Process for managing school organization data
8.	Teacher management	Teacher data	Teacher data information	The process of managing teacher data
9.	Gallery management	Gallery data	Gallery data information	Process in managing gallery data
10	Achievement management	Achievement data	Achievement data information	process in managing achievement data
11.	Management of outstanding students' data	Student data of outstanding students photos of outstanding	Information of outstanding students information on photo data of outstanding students	Process for managing data on outstanding students
12.	Model student management	Model student data, model student photo data,	Model student data information data information for model	The process of managing model student data

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No	Process Name	Input	Output	Description
		article data	students	
13.	Article management	Article Data	Article Data	Process in managing article data
14.	Management of teaching materials	Teaching material data	Information on teaching materials	process in managing data teaching materials
15.	Contact management	Contact data	Contact data Information	Process of managing contact data

The ERD design for SD Negeri 14 Pontianak City is presented in Figure 4, providing a comprehensive visualization of the database structure and the interconnections between entities within the system. This ERD highlights three primary entities, with the admin entity playing a pivotal role in the system. The admin possesses the authority to input diverse data into the information system, including school history, vision and mission statements, remarks by the principal, and more.

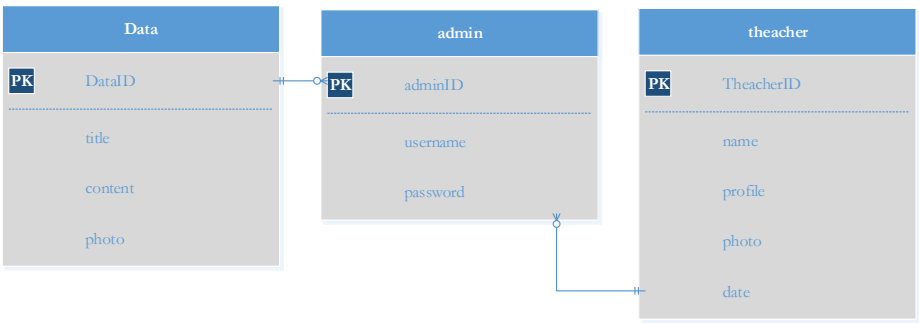

Figure 4. Entity Relationship Diagram (ERD)

The ERD design provides a detailed representation of the attributes associated with each entity, encompassing crucial information such as admin ID, username, and password. For the teaching entity, attributes such as names, photos, and IDs are included to ensure comprehensive data representation. The ERD design is meticulously adjusted to accommodate the specific inputs required by the information system, facilitating an efficient and well-structured data management approach.

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By analyzing the ERD design, stakeholders can gain a deep understanding of the underlying relationships between entities and the corresponding attributes assigned to each entity. This ERD serves as a fundamental framework for organizing and managing data within SD Negeri 14 Pontianak City's information system, supporting effective decision-making and streamlined data management processes.

3.4 Development

The implementation or development of SD Negeri 14 Pontianak City's website involves the utilization of a programming language to create an interface design. This stage focuses on transforming the website's conceptual design into a functional and interactive platform for users to engage with. The main page of the SD Negeri 14 Pontianak City website serves as the initial interface that visitors encounter. This page is divided into distinct sections, namely the header, content, and footer. The header section prominently features a navigation menu consisting of Home, Profile, Information, Insights, and Contact. This menu facilitates easy navigation and allows users to explore different sections of the website effortlessly.

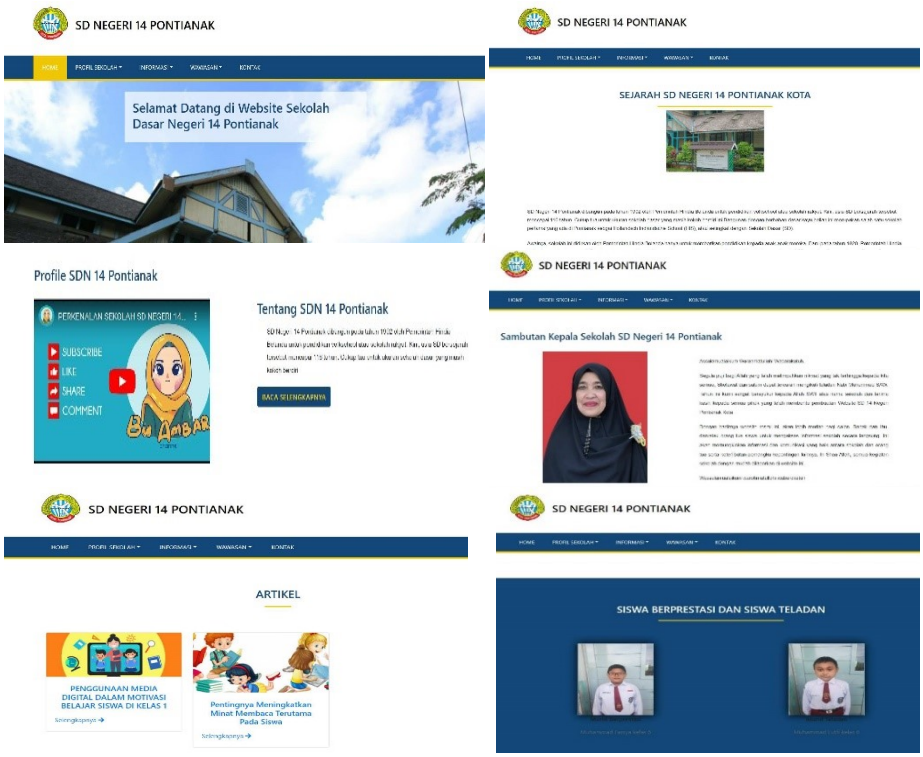

Figure 5. Home

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The content section, which is accessible through each navigation menu item, contains various components. These components include a brief introduction to the school's profile, noteworthy remarks from the Principal of SD Negeri 14 Pontianak City, informative articles, details about extracurricular activities, and contact information. Each component offers valuable insights and relevant information for users to delve into. For a visual representation of the main page's layout and structure, please refer to Figure 5. This figure provides a graphical depiction of the main page, illustrating the arrangement of the header, content, and footer sections. By exploring the different sections of the main page, users can navigate through the website and access the wealth of information and features provided by SD Negeri 14 Pontianak City's website.

The admin login page serves as a crucial security measure for accessing the admin dashboard of SD Negeri 14 Pontianak Kota's website. This page acts as a protective barrier, requiring authorized admins to input their designated username and password to gain entry. The admin login process ensures that only authorized personnel can access the admin dashboard, which holds administrative functionalities and controls. By entering their unique credentials, admins can securely log in and gain access to the privileged areas of the website, allowing them to manage and oversee various aspects of SD Negeri 14 Pontianak Kota's online presence. Figure 6 provides a visual representation of the admin login page, emphasizing the importance of user authentication in maintaining the website's security. Through this login page, admins can establish a secure connection to the admin dashboard, enabling them to perform administrative tasks, update information, and manage the website effectively.

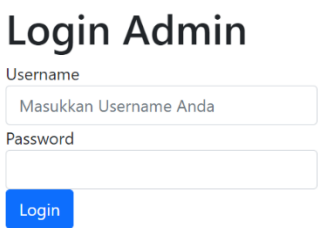

Figure 6. Login admin

The admin main page serves as the primary interface for administrators when accessing the system. It provides a comprehensive navigation menu, as showcased in Figure 7, which grants administrators access to various essential features and information within SD Negeri 14 Pontianak Kota's admin dashboard. The navigation menu on the admin main page is divided into several key sections. Within the "School Profiles" section, administrators can access vital information such as the school's history, vision and mission statement, greetings from the

principal, school announcements, and details about former principals. The "Information" menu allows administrators to access crucial data related to teachers, galleries displaying school events, school achievements, outstanding students, and model students. The "Insights" menu offers resources such as teaching materials and articles on relevant topics. Lastly, the "Contact" menu provides administrators with important contact details for the school.

Figure 7 visually presents the layout and organization of the admin main page, showcasing its user-friendly interface and seamless access to crucial information. Administrators can efficiently navigate the admin dashboard by utilizing the navigation menu, enabling them to make updates, manage content, and effectively oversee various aspects of SD Negeri 14 Pontianak City's online presence. The admin main page provides administrators with a centralized hub for administrative tasks and facilitates streamlined management of the school's digital platform.

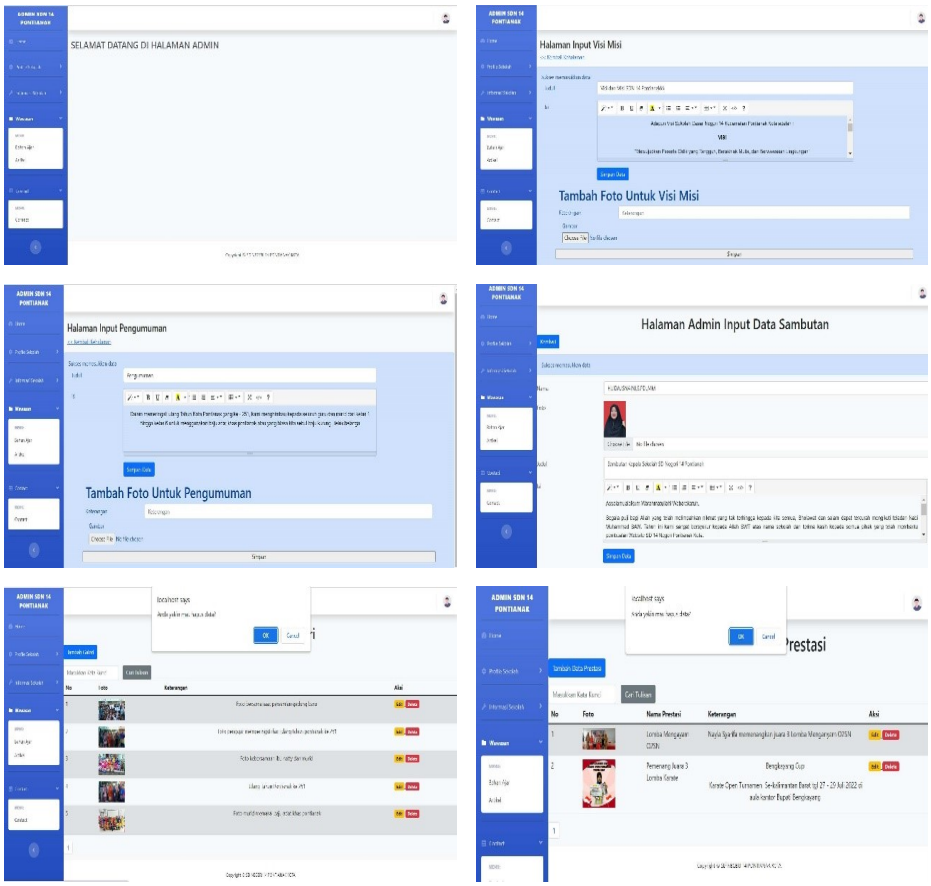

Figure 7. Admin Dashboard

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3.5 Testing

Testing is a crucial final stage in this research, aimed at ensuring that the developed system is fully prepared for practical use. In order to validate its functionality and effectiveness, rigorous testing was conducted on two distinct user groups: admin users and visitors. The initial test focused on evaluating the performance of the admin page, as detailed in Table 2.

Thorough testing allows for the identification and resolution of any potential issues or shortcomings within the system. By subjecting the admin page to comprehensive testing procedures, researchers were able to assess its usability, responsiveness, and overall user experience. This test served as a vital step in validating the functionality and reliability of the system, ensuring that it meets the intended objectives and requirements.

Additionally, testing was conducted to gauge the system's performance from the perspective of visitors. This enabled researchers to evaluate factors such as accessibility, navigation, and content presentation, ensuring that the website offers a seamless and engaging experience for its users. By undertaking thorough testing on both admin users and visitors, researchers were able to address any issues or areas of improvement, guaranteeing a robust and user-friendly system that meets the needs of its intended audience.

Table 2. Admin Page Test

No	Testing	Input	Expected results	Conclusion
1	Login admin	Fill in the username and password then click login	The system will display the message "please enter all fields"	Success
		Fill in the appropriate username and password then click login	The system receives login access, and the admin successfully enters the admin page	Success
2.	School profile menu	Pressing the menu edit profile short history button	Displays the admin page, inputs the history profile, and presses the save data button and displays the message "Successfully entering data" and the database is updated according to the edited data	Success

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No	Testing	Input	Expected results	Conclusion
3.	Vision and mision Menu	Pressing the edit button on vision and mission data	Displays the admin page for inputting vision and mission data and if you press the save data button it will display the message "successfully entered data" and the database is updated according to the edited data.	Success
4.	Principal welcome menu	Pressing the edit data button on the principal's speech	Displays the admin page for inputting the principal's welcome data and if you press the save button it will display "successfully entered data" and the database is updated according to the edited data	Success
5.	Announcement menu	Pressing the edit announcement data button	Displaying the admin input page for the principal's greeting and pressing the save data button will display the message "successfully entered data" and the database is updated according to the edited data.	Success
6.	Menu data of former school principals	Pressing the former principal's data edit button	Displays the admin page for the former principal's data input and if you press the save button it displays the message "successfully entered data" and the database is updated with edited data	Success
7.	School organization menu	Pressing the school organization data edit menu	Displays the admin page for inputting school organization data and if pressing the save button displays the message "successfully entered data" and the database is updated with edited data	Success
8.	Teacher menu	Press the add and edit teacher button	Displays the teacher data input admin page if you want to add or edit data and if you press the save data button it will display the message "successfully entered data"	Success

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No	Testing	Input	Expected results	Conclusion
			And the database is updated according to the data added or edited	
9.	Gallery menu	Press the add gallery button	Displays the gallery data input admin page and if you press the save data button it will display the message "successfully entered data" and the database is updated according to the edited data.	Success
		Press the add delete button	Display the message "Are you sure you want to delete?" If the user clicks "OK", the data will be deleted.	Success
10.	achievement menu	Pressing the edit achievement data button	Displays the admin input page and if you press the save button the data will display the message "successfully entered data" and the database is updated according to the edited data.	Success
		Displays the delete button	Displays the message "Are you sure delete?" if click okay then the data is deleted	Success
11	Teaching materials menu	Press the add teaching material button	displays the admin page for inputting teaching material data and if you press the save button the data will display the message "Successfully entering data" and the database is updated according to the edited data.	Success
12	Article Menu	Pressing the edit button on the article page	Displays the article admin page and if you press the save data button it will display the message "Successful data entry" and the database is updated according to the edited data.	Success
13	Contact menu	Pressing the edit button on the contact page	Displays the contact admin page and if you press the save data button it will display the message "Successful data entry" and the database is updated according to the edited data.	Success

All tests conducted on the admin dashboard, as shown in Table 2, achieved a 100% success rate. These tests encompassed various functionalities, including login verification, data manipulation (such as editing, inserting, and deleting), and

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utilizing the available menu options. Throughout the testing process, every function performed successfully and operated smoothly, ensuring the system's effectiveness and reliability. With the admin dashboard functioning optimally, the focus now shifts to conducting further testing on the visitor page, as described in Table 3.

Tabel 3. Visitors Testing Page

No	Testing	Expected Results	Conclusion
1	Pressing the home menu	Displays the home page	Success 
2	Play a school introduction video	Videos can be played	Success 
3.	Pressing read in full on SDN 14 Pontianak's profile in the explanation section	Displays pages related to school profiles (history pages)	Success 
4	Pressing in full on the principal's remarks	Displays related pages (principal's welcome page)	Success 

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5	Pressing see more news in the article section	Displays related pages (article pages)	Success 
6.	Pressed one of the articles	Displays news articles	Success 
7	Pressing see more teachers in the students section	Displays other teachers with related pages (teacher pages)	Success 
8	Pressing see more achievements in the achievements section	Displays other achievements related to other pages (school achievements)	Success 
9	Pressing the vision and mission menu on the school profile	Display page	Success 
10	Pressing the announcement menu on	Displays the announcement page	Success

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	the school profile		
11	Pressing the former principal's menu	Displays the page of principals who have served	Success 
12	Press the school organization menu	Displays the school organizational structure page	Success 
13	Pressing the gallery menu	Display the gallery menu	Success 
14	Pressing the menu of outstanding and exemplary students	Display the menu of outstanding and exemplary students	Success 
15	Pressing the teaching	Display the teaching	Success

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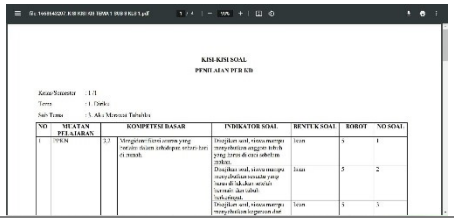
	materials menu	materials menu	
16	Pressing the download button to download one of the teaching materials	Displays the results of downloads of teaching materials	Success 
17	Pressing the contact menu	Display the contact menu	Success 

Table 3 demonstrates the successful testing of the visitor page within the school information system for SD Negeri 14 Pontianak City. Each menu and functionality provided on the visitor page underwent rigorous testing to ensure optimal performance. The testing process encompassed examining the proper functioning of every menu, ranging from the home page to the contact page.

The results of the testing revealed a 100% success rate, affirming that all menus and functionalities within the visitor page operate smoothly and efficiently. Users can navigate through the various sections of the website, access relevant information, and interact with the system as intended. With this positive outcome, it can be concluded that the visitor page of the school information system for SD Negeri 14 Pontianak City is fully functional and ready for public use.

The investigation of the school information system for SD Negeri 14 Pontianak City has yielded valuable insights. The login process stands out as a critical gateway, ensuring secure access to the website. By verifying login credentials and offering confirmation upon successful authentication, the system bolsters the overall

security of the platform. Furthermore, the exploration of various management processes has underscored their significance in organizing and streamlining efficient data management. From history and contact management to facilitating effective communication and showcasing school achievements, these processes play pivotal roles in delivering relevant information to users. They also provide valuable insights into the school's past leadership and organizational structure, supporting historical research and promoting a comprehensive understanding of the institution. The ERD design has emerged as a focal point in the system's context, providing an encompassing view of the database structure and entity relationships. This design not only illustrates how different entities interact but also emphasizes the admin's authority in inputting and managing data. With its focus on efficient organization and storage, the ERD design enables the system to operate seamlessly and effectively.

Moreover, the examination of the main page and admin dashboard has highlighted their user-friendly interfaces and the accessibility of key sections. These interfaces empower users to navigate effortlessly and access crucial information, such as school profiles, announcements, teaching materials, articles, and contact details. The well-structured layout enhances the user experience by facilitating efficient information retrieval. Finally, the successful testing of both the admin and visitor pages confirms that the system's menus and features are performing as intended. This underscores the system's robustness and reliability, providing users with a seamless and interactive platform. Overall, these findings showcase the development and functionality of the school information system for SD Negeri 14 Pontianak City. With its user-friendly interfaces, efficient data management processes, and successful testing outcomes, the system contributes to an enhanced user experience and effective management of school-related information.

4. CONCLUSION

The web-based school information system design implemented at SD Negeri 14 Pontianak City has demonstrated its potential to greatly facilitate the dissemination of information to a wide audience, including students, parents, teachers, and prospective students. This system effectively delivers school-related updates, ensuring that visitors to the information system are promptly informed about the latest happenings at Public School 14 Pontianak City. Furthermore, thorough testing using the black box method was conducted on both the admin dashboard and the visitor page, yielding exceptional results. All menus performed as intended, achieving a remarkable 100% success rate. These outcomes align with the project's

objectives and expectations, confirming the system's reliability and successful implementation. The authors firmly believe that the developed information system will streamline communication and enhance the overall efficiency of SD Negeri 14 Pontianak City. By providing up-to-date and accessible information, the system enables effective engagement with various stakeholders and supports informed decision-making. The successful implementation and testing outcomes validate the system's effectiveness and its potential to positively impact the school community and its stakeholders.

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