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Design of a Web-Based Information System for Sibolangit Village Using the Waterfall Method

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Abstract

The development of village governance today has improved with the presence of village fund allocations from the central government aimed at advancing rural areas. Village development is now inseparable from the support of information technology, as almost every village needs information technology to improve services to the community. One example of this is the 'Internet for Villages' program, where the internet is no longer only enjoyed by urban communities but has also reached rural areas. The difficulty in accessing information has made the researcher interested in developing a web-based village information system with the aim of improving services to the rural community. Information can be easily accessed, promoting the products of the village community, village potential, population statistics, and so on. This will be carried out using literature review, interviews, and system design methods. This web-based information system can enhance services to the community, making information accessible easily and accurately.

Keywords

Village Website, Village Information System, Information Technology, and Village Profile

Introduction

The development of villages today is closely linked to the advancement of information technology, ranging from the simplest forms, such as the use of mobile phones, to smartphones and the utilization of the internet with various features aimed at assisting the public in their daily activities, not only in urban areas but also in rural areas. Information and communication technology provides numerous benefits for human life, including simplifying tasks such as correspondence, social media communication, and promoting agricultural products. With the help of information technology, the information being shared can be easily accessed by both rural and urban communities.

The lack of understanding of information technology among the public and village apparatus has led to suboptimal public services. The village government apparatus, as public servants, must master information technology so that they can provide optimal services to the community. System design and information technology are essential to prepare organizations

to plan the use of technology and information systems for their operations. Such design is necessary to align the organization's activities with the information system, keeping pace with the organization's development to meet future organizational information system needs. The equitable distribution of welfare in Sibolangit village, Deli Serdang district, has not yet been fully achieved. This has resulted in limited knowledge about human resources in the area, one of which is a lack of knowledge about information technology.

The need for information among the local community is significant, but it is not adequately supported due to the lack of knowledge about information technology. The implementation of a web-based information system will provide the community with the ease of accessing information quickly and accurately, tailored to their needs.

Methodology

The research method applied in this study is the Waterfall method.

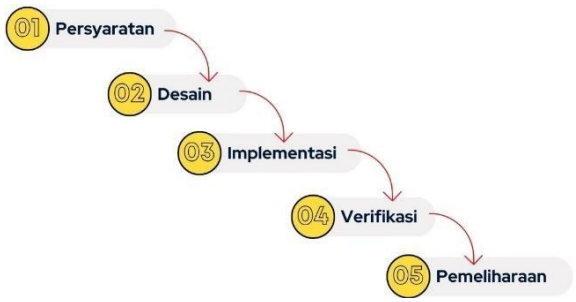

Figure 1: Waterfall Method

The Waterfall method is one of the oldest and most well-known software development methodologies. This method describes a structured and linear approach to software development, where each phase in the development process must be completed before the next phase begins. The Waterfall method consists of six main phases: analysis, design, implementation, verification, and maintenance. Each phase produces documents or products that serve as inputs for the next phase, with little or no possibility of returning to previous phases once a phase is completed. "Mohamed, K. (2019)"

The following are the phases in the Waterfall method in general:
a). Requirements: This phase involves identifying the user and system requirements that must be fulfilled by the software being developed. It includes functionality, performance, user interface, and other requirements that the software must meet.
b). Design: This phase involves designing the software structure based on the previously identified requirements. It includes designing the system architecture, user interface design, and detailed design of software components.
c). Implementation: This phase involves building the software based on the design that has been created. It is the stage where the actual program code is written and the software components are developed.
d). Verification: This phase involves testing the software to ensure that it meets the established requirements. It includes functional testing, performance testing, and other tests to ensure the quality of the software.
e). Maintenance: This phase involves maintaining the software after its release. It includes fixing bugs, performance improvements, and other changes necessary to ensure the software continues to function properly.

Findings

1.1. System Design Analysis

After the requirements analysis, the next step is to create a design based on the obtained requirements to facilitate the system development. The system design in this study uses a use case diagram. A use case diagram is a model for the behavior of the information system to be developed. Use cases describe an interaction between one or more actors and the information system that is being created. This diagram describes what the system will do. With this use case diagram, typical interactions between the admin, the Village Head, and the community can be illustrated.

1.2. Use Case Design

A use case shows the interaction relationships between actors and use cases within a system, aiming to determine how actors interact with the system.

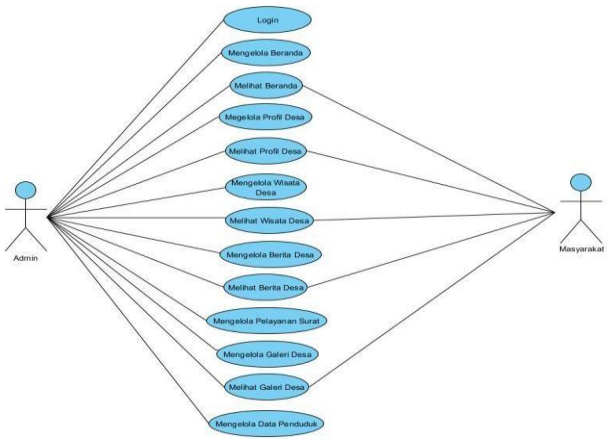

Figure 2: Use Case Diagram for the Admin Actor

a. Use Case Name: Login
Actor: Admin
Pre-condition: The user enters the login page
Post-condition: The user successfully displays the login page

Table IV.1: Login Use Case Table

Actor	Description
Admin	Login
	Manage Community Data: Input new community data, edit community data, delete community data.
	Manage Community Data: Input new community data, edit community data, delete community data.
	Manage Village Gallery Data: Input event photos, delete event photos.
	Manage Village News Data: Input the latest news, edit news, delete news.
	Manage Village Tourism Data: Input village tourism, edit village tourism, delete village tourism.
	Manage Homepage Data: Input data, edit data, delete data.
	Manage Letter Service Data: Input community data, print service letters.
Community	Can view village information presented by the Admin/Village Apparatus on the website, such as village news, village gallery, village profile, and village tourism.

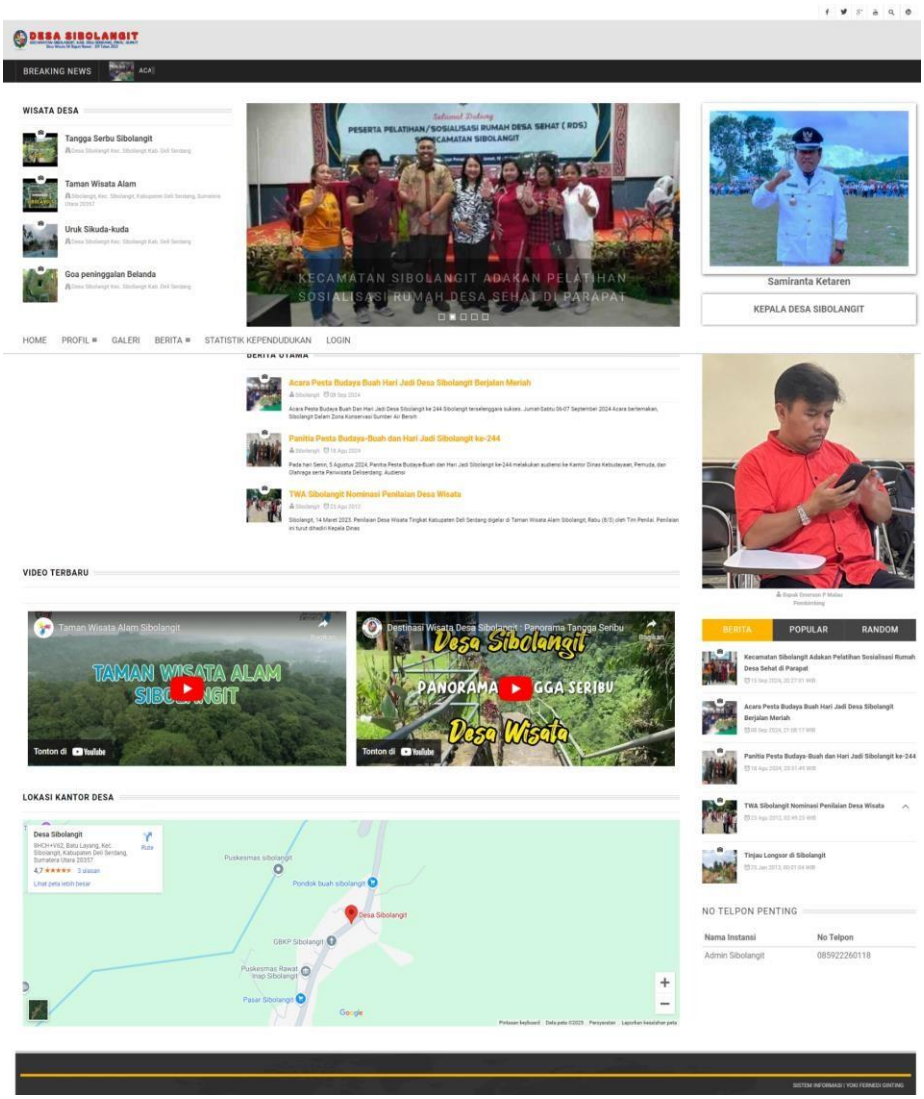

Figure 3: Main Page

The main page of the Sibolangit Village website provides important information such as village tourist destinations, the latest news, the profile of the village head and apparatus, village videos, and a map of the village location. This page is designed to make it easier for visitors to access relevant information about Sibolangit Village.

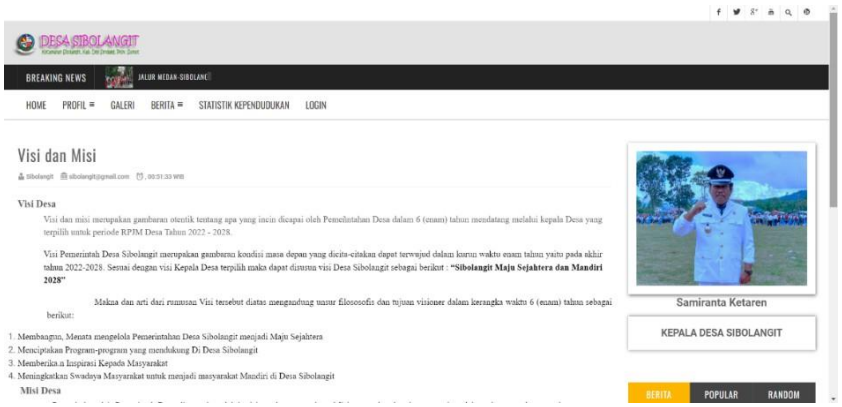

Figure 4: Village Profile Page

The Village Profile page contains comprehensive information about Sibolangit Village, including an explanation of the village's vision and mission, which serve as a guide for development and public service. This page provides an overview of the village's history, the values upheld, and the long-term goals intended to be achieved for the well-being of all village residents.

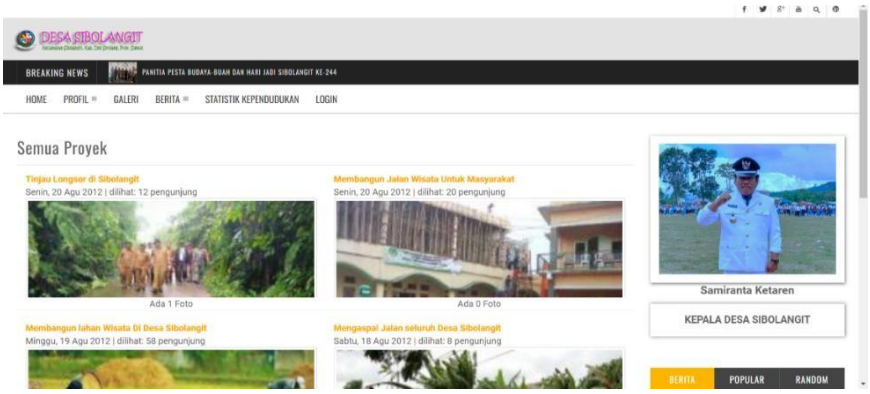

Figure 5: Village Gallery Page

The Gallery page displays a collection of photos of projects that have been carried out in Sibolangit Village. Here, visitors can view visual documentation of various development activities and village initiatives, providing a tangible representation of the progress and collective efforts to improve the quality of life for the village community.

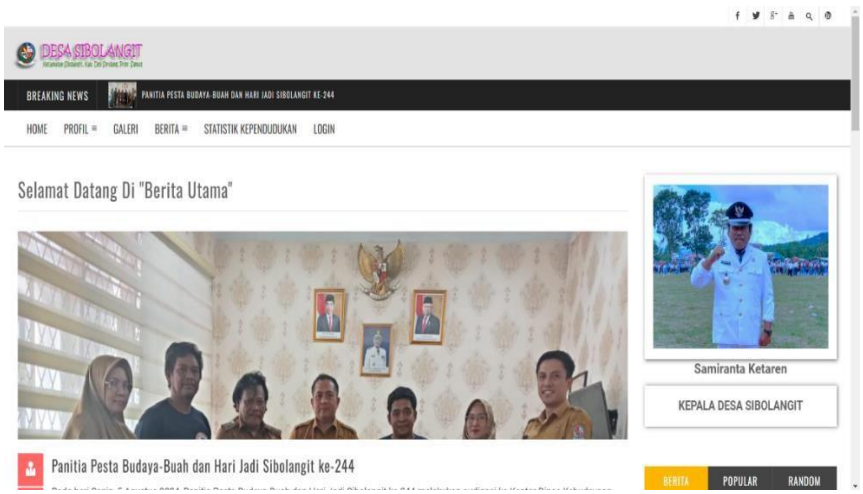

Figure 6: Village News Page

The Village News page presents the latest information and important updates regarding various activities, events, and developments in Sibolangit Village. Visitors can read the latest news covering various aspects of village life, from government activities to community participation in local events.

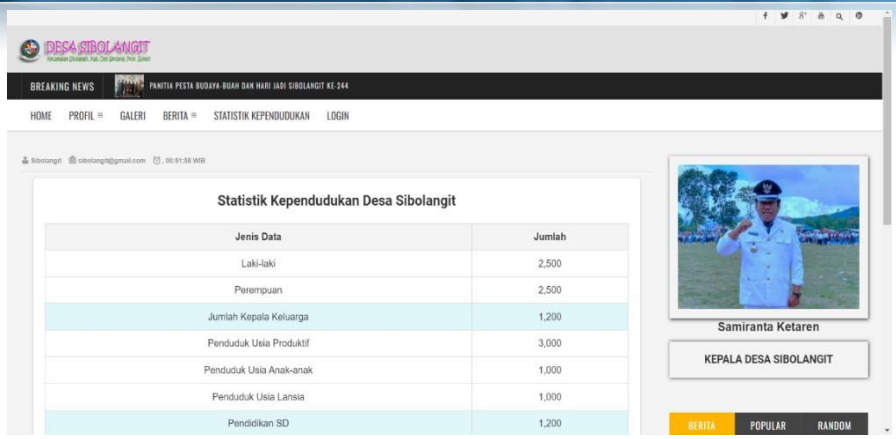

Figure 7: Population Statistics Page

On this page, visitors can view information such as the population count based on age, gender, occupation, and education status. These statistics help in understanding the composition of the village community and support more effective development planning.

Figure 8: Admin Login Page

The Admin Login page is a special page used by the administrator to access and manage the Sibolangit Village website system. Through this page, the admin can log in by entering a provided username and password, allowing them to manage content, oversee population data, and update information securely and in a controlled manner.

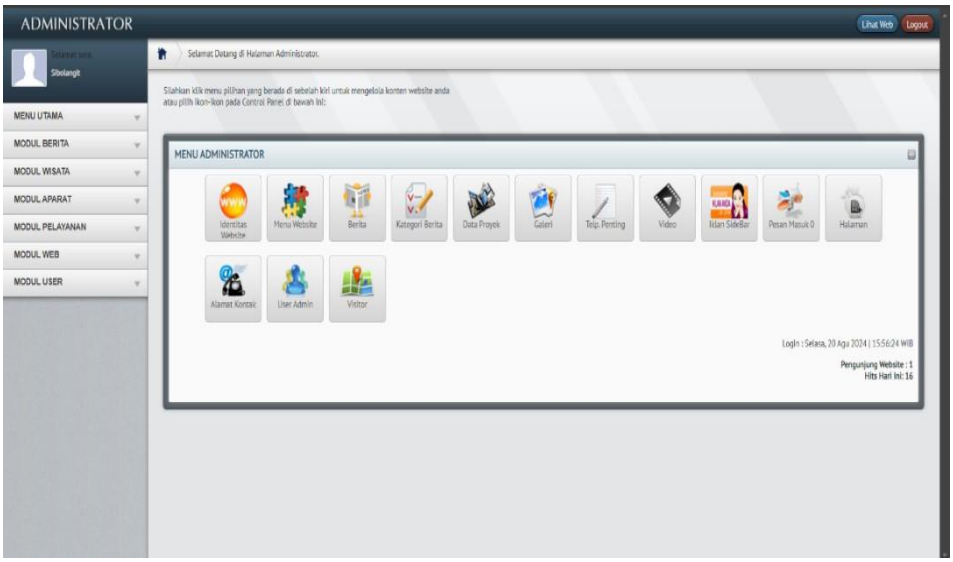

Figure 9: Administrator Page

The Administrator Page is the control center for the admin to manage all aspects of the Sibolangit Village website. This page is designed to be user-friendly, allowing the admin to perform their functions efficiently and ensure that the information presented is always accurate and up-to-date.

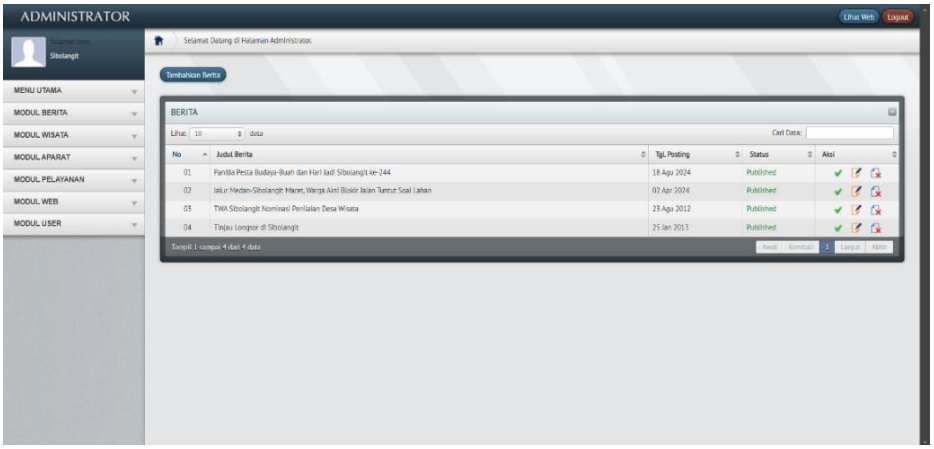

Figure 10: Add News Page

The Add News page allows the admin to add new news to the Sibolangit Village website. Once the news is added, the latest information will be immediately available on the Village News Page, ensuring that residents and visitors always have access to the most up-to-date information.

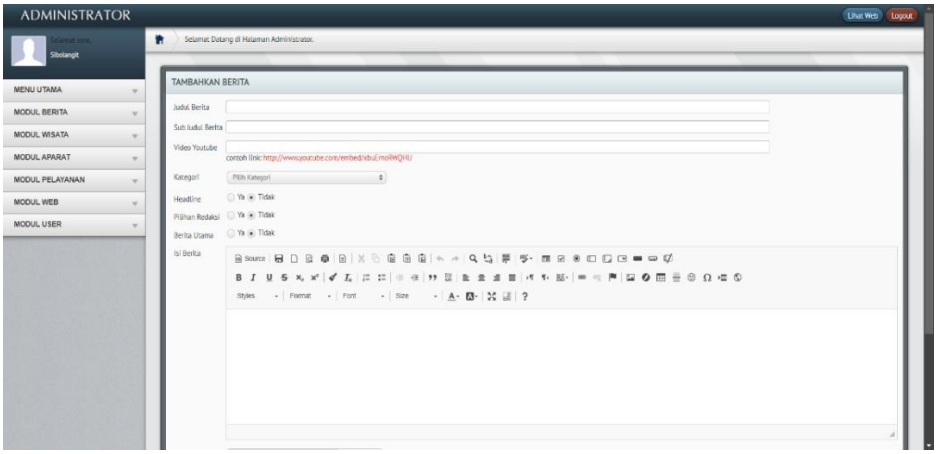

Figure 11: News Input Form Page

The News Input Form page is where the admin can enter the details of new news for the Sibolangit Village website. This page provides a form that allows the admin to fill in the necessary information. With this form, the admin can easily add and update news, ensuring that the Village News page always reflects the latest and most relevant information.

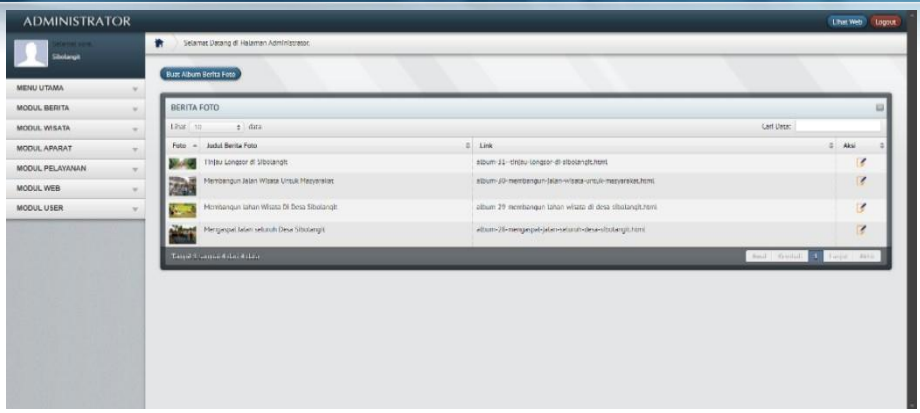

Figure 12: Add Photo Gallery Page

The Add Photo Gallery page allows the admin to upload the latest photos to the Sibolangit Village website gallery. On this page, the admin can enter a photo title and upload the image file to be displayed. Once the photo is added, it will appear in the gallery page, providing an engaging visual documentation of various projects and activities in the village.

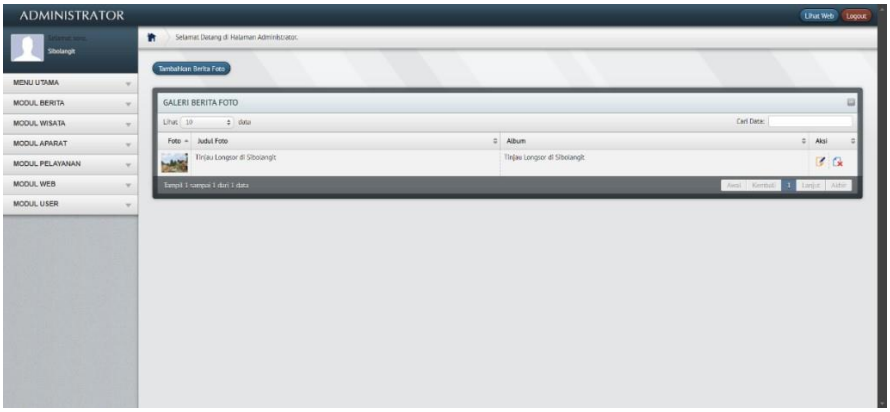

Figure 13: News Photo Page

The News Photo page displays a collection of photos related to the latest news in Sibolangit Village. On this page, visitors can view photos that document various important events, activities, and occasions that have been reported in the news.

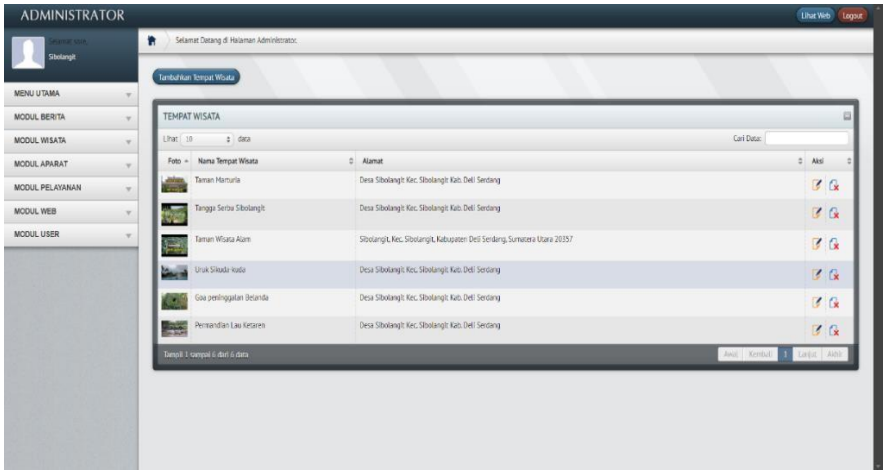

Figure 14: Add Tourism Page

The Add Tourism page allows the admin to add new tourist destinations by filling in the name of the place, description, photo, and location information. After being saved, the tourism details will be displayed on the Village Tourism page.

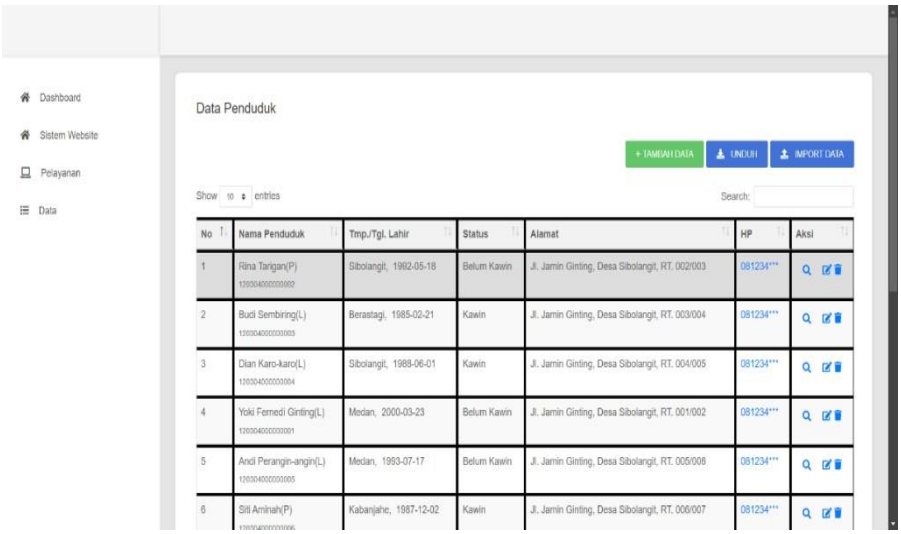

Figure 15: Population Data Page

The Population Data page displays comprehensive information about all the residents of Sibolangit Village. This page aims to provide a clear overview of the village's demographic composition and supports planning and the management of public services.

Conclusion

The method used in the development of a web-based information system for Sibolangit Village, Deli Serdang Regency, concludes that the implementation of information technology has great potential to improve public services and knowledge about human resources in the area. A lack of understanding of information technology can hinder optimal services, making it important to design an information system that aligns with the community's needs.

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