CEPAT Journal of Computer Engineering: Progress, Application and Technology
Vol. 2, No. 4, November 2023, pp. 1-10
ISSN: 2963-6728, DOI: https://doi.org/10.25124/cepat.v2i04.6358

Development of a user interface (front end) in a website-based village information system to improve service quality and community empowerment information

Muhammad Raga Titipan[1], Agus Virgono[1], Faisal Candrasyah Hasibuan[1]
[1]Department of Computer Engineering, School of Electrical Engineering, Telkom University, Indonesia

Article Info

Article history:

Received July 24, 2023
Revised July 26, 2023
Accepted July 26, 2023

Keywords:

Village
Information System
Digitalization
Sindangresmi

ABSTRACT

The research aims to design an innovative front-end website for Sindangresmi Village, which is the most accurate population data source among ten villages in Jampang Tengah District, Sukabumi Regency. However, the current data collection and processing are manual, leading to frequent errors and duplication. The study proposes modern technology-based solutions to address these challenges and improve effectiveness and efficiency in handling population data and providing public information. The website-based village information system is expected to overcome manual data collection obstacles and provide accessible information access for the village community. The research uses HTML, PHP framework (CodeIgniter) for the front-end website development and focuses on a case study in Sindangresmi Village. The main result is an intuitive front-end website with essential features, enabling villagers to fill out population data, manage village information, and access public data. By adopting this website-based system, the quality of service and information accessibility in Sindangresmi Village will significantly improve, empowering the village community to access accurate and relevant information.

Corresponding Author:

Muhammad Raga Titipan
Department of Computer Engineering
School of Electrical Engineering, Telkom University
Bandung, Indonesia
Email: mragatitipan@student.telkomuniversity.ac.id

1. INTRODUCTION

In the context of front-end development for villages, this research aims to design a practical solution as an integrated and user-friendly village website. Villages in Indonesia have a vital role in national development, but difficulties in collecting and digitizing data lead to data duplication and human error. The need for digitization also impacts village information infrastructure, limiting access to information and skilled resources in technology.

To overcome this challenge, the proposed solution is implementing an intuitive website-based village information system. A thorough analysis of village needs, and accurate data collection will form the basis for designing a website that fits the needs of village communities. This website will provide important features such as population registration, village administration, public information, and community reports to ensure better information accessibility.

Several examples of villages that have been successfully digitized, such as Sumbermujur Village and Cikadu Village, show the benefits of implementing a website-based village information system. In addition, the author also proposes adding integrated tourism website features to promote local tourism potential and support economic development at the village level.

It is hoped that by adopting the right information technology, this front-end development will provide a better user experience, expand information accessibility, and realize holistic village development. Addressing digitalization challenges can contribute to efficiency, transparency, and active community participation in sustainable village development efforts.

2. METHOD

Front End

Front End is a software system or application component that interacts directly with end users. According to the journal "International Journal of Human-Computer Studies," Front End refers to a user interface that allows users to interact with the system visually and functionally. Front End includes layout, graphic design, navigation, input forms, and other interactive elements that allow users to communicate with the system.

An excellent Front End should pay attention to intuitive and efficient users. In the journal "Behavior & Information Technology," the front end is referred to as a human user interface (human-computer interface) which aims to facilitate effective communication between the user and the system used. Therefore, the Front End is essential in providing a good user experience and ensuring efficient and effective interactions between users and the software systems or applications used.

2.1. System Architecture

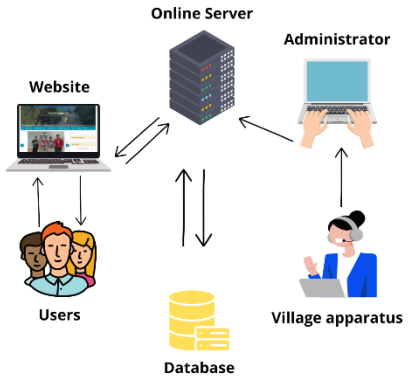

Figure 1. System Architecture

The users here are the people of Sindangresmi Village, and the admin is part of the village government apparatus. The digital village website server uses a cloud hosting service to make it faster for real-time data access. So that anyone can access this website according to their interests.

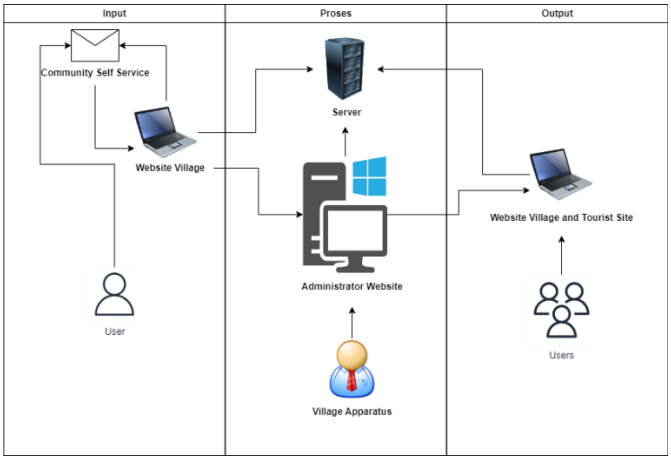

Figure 2. System interaction with humans

2.2. Flowchart

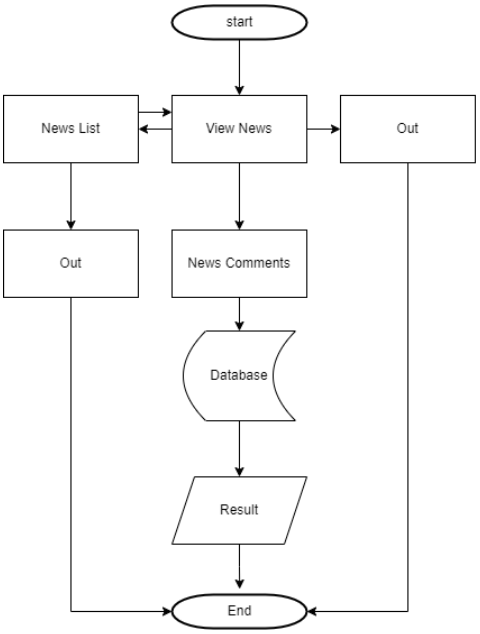

Figure 3. Flowchart - login as admin village and travel

2.3. Usecase Diagram

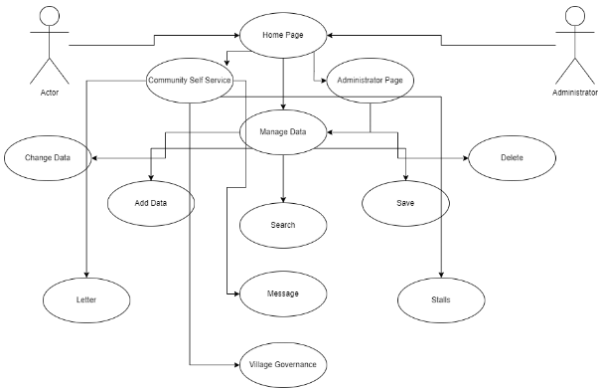

Figure 4. Usecase - diagram of the village site

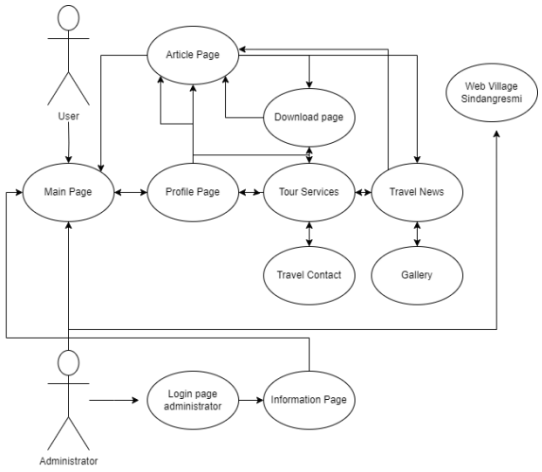

Figure 5. Usecase - diagram of a tourist site

In the system, there are two users, namely people who have a NIK (Resident Identification Number) and a pin that the admin will give to be able to create an account.

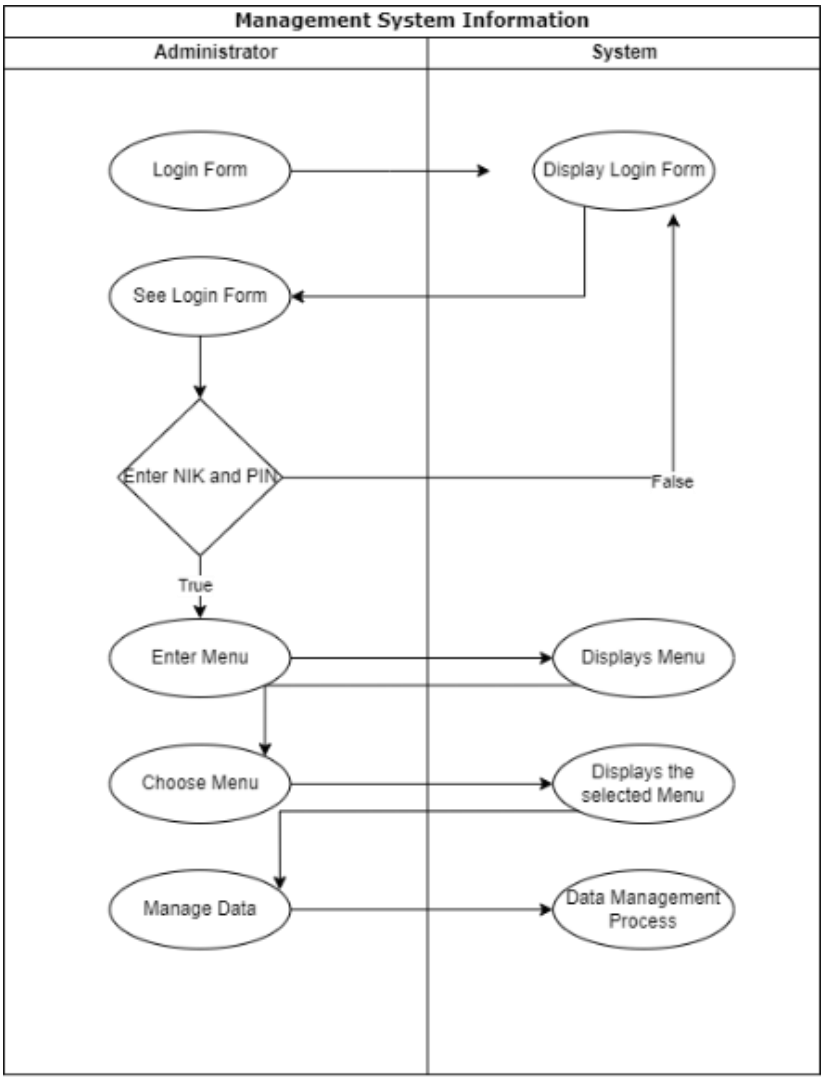

Figure 6. Activity diagram - admin

Modul System

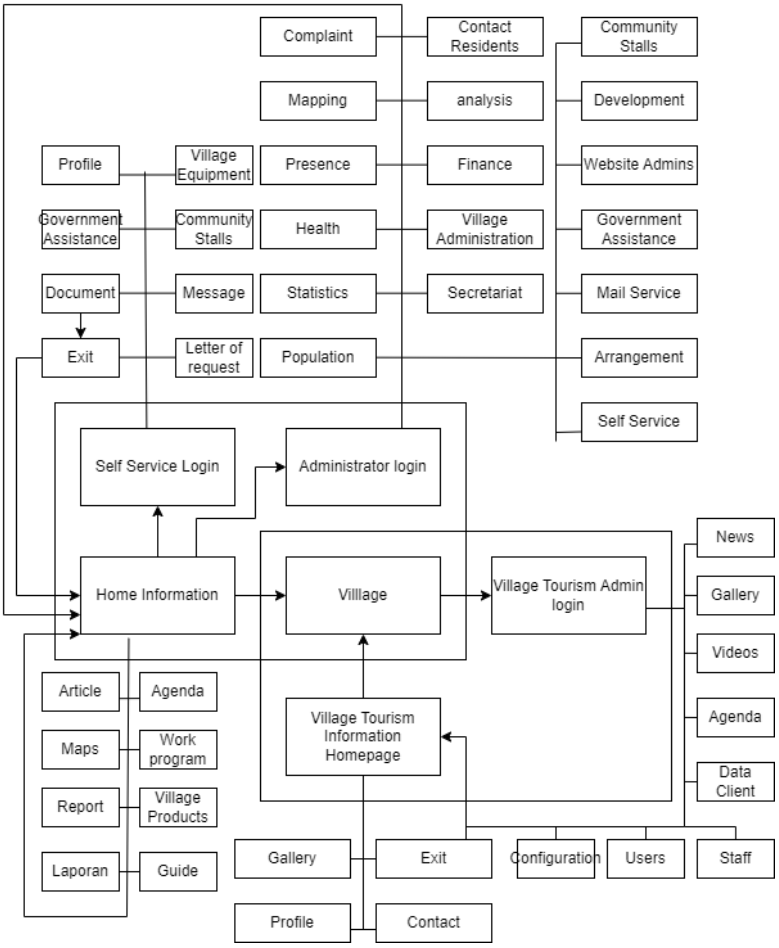

Figure 7. Activity diagram - block site

Blocks in the village information system:
User Interface: Relates to user display and interaction, such as data views, forms, buttons, and links.
Data Collection: Involves collecting data from various sources such as population registration and village administration requests.
Data Storage: Responsible for storing and managing data in a structured and secure manner using a database or storage system.
Data Processing: Processing data collected, including processing, validation, and processing into meaningful information.
Information Retrieval: Allows users to access information processed and stored in the system through the UI, such as public information searches or data reports.
Data Analysis: Related to analyzing data to gain deeper insights from the data collected, assisting decision-making and planning at the village level.
Reporting: This involves making reports based on processed data and information, which the village or related agencies can use for reporting and monitoring purposes.
Data Security: Handles data security issues in village information systems, including data security from unauthorized access, privacy protection, and prevention of cyber attacks.

2.4. User Interface

In the context of a village information system, the User Interface plays an important role because it acts as a bridge between users (village people, village officials, or administrators) with the data and features provided by the system. The purpose of the User Interface is to provide an intuitive, efficient, and pleasant user experience so that users can easily access information and use existing features.

2.5.1. Village site user interface

The User Interface (UI) in the village information system is an interface or display that allows users (village people, village officials, or administrators) to interact with the village information system. The UI visually presents system information and functionality so that users can easily understand and use the system.

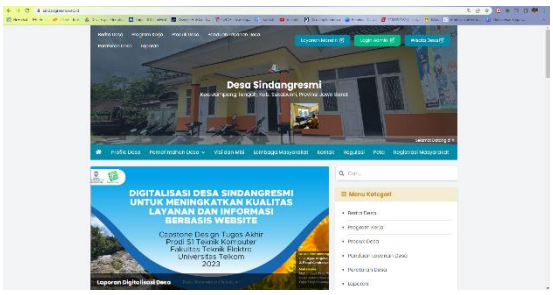

Figure 8. Home Page

Data Display: UI presents data in a structured and informative way. Village-relevant data, such as population information, village administration, tourism potential, and development projects, can be displayed clearly and easily understood.

Use of Local Languages: UI can use local languages and icons familiar to villagers to increase their understanding and participation in using the system.

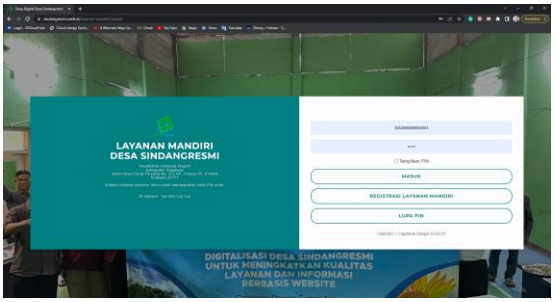

Figure 9. Community Login Page

Forms and Interaction: The UI provides forms that allow users to input data or submit applications, for example, a resident registration form or application for a business license. Users can interact with the UI through buttons, links, and other elements.

Consistency and Aesthetics: The UI is designed with a consistent appearance and use of design elements. Consistent colors, fonts, and visual styles create a professional and appealing appearance.

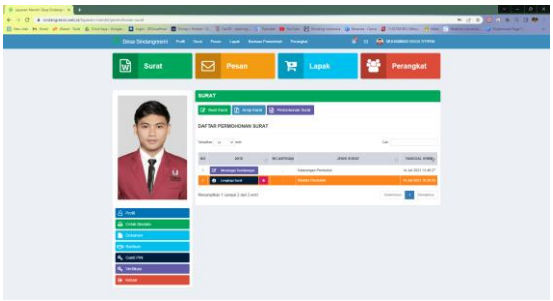

Figure 10. Community Home Page

Navigation: The UI provides a structured navigation menu so that users can quickly move between different pages or features in the system. Straightforward navigation helps users quickly find the information they need.

Notifications and Feedback: UIs can provide users with visual notifications and feedback, such as error messages during data validation, confirmation of success after submitting a form, or notifications about system updates.

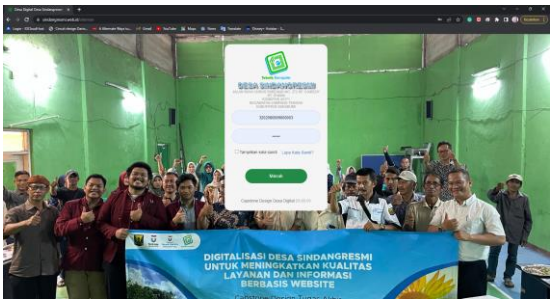

Figure 11. Administrator login page

Visualizations and Graphics: UIs can use visualizations and graphics to present data more attractively and understandably. Graphs, charts, or maps can help users understand the data and information presented.

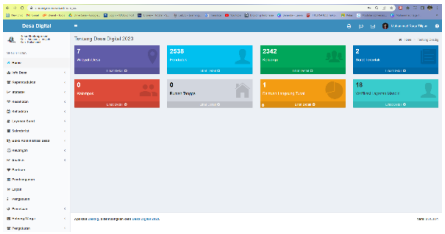
Figure 12. Administrator home page

Responsiveness: The UI is designed to be responsive and adaptable to the user's device, such as a computer, tablet, or smartphone. This ensures an optimal user experience without zooming in or out.

2.5.2. Travel site user interface

Curug Pareang Information Display: The UI presents complete and structured information about Curug Pareang, including a brief description, location, accessibility, attractiveness, and natural charm. This information helps tourists to get to know the attractions better before they visit the location.

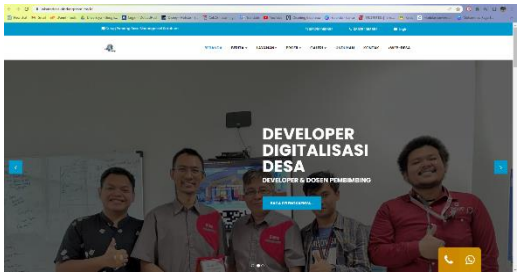

Figure 13. Home page

Photo and Video Galleries: The UI can present photo and video galleries of Curug Pareang, allowing tourists to see an engaging visual portrait of the natural beauty and atmosphere around the waterfall.

Map and Navigation: The UI can provide interactive maps that make it easier for tourists to find the location of Curug Pareang and arrange their travel routes. The navigation system can help tourists reach their destination more quickly.

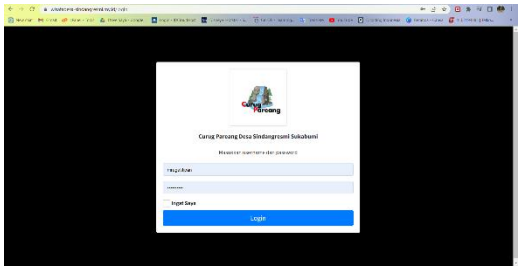

Figure 14. Administrator login page

Tour Packages: If available, UI can display information about tour packages offered at Curug Pareang, including the range of activities, prices, and facilities provided.

Order and Contact Forms: UI can provide an order form or direct contact with the tour operator if there are booking services or questions. Tourists can contact the tour manager for reservations or get more information.

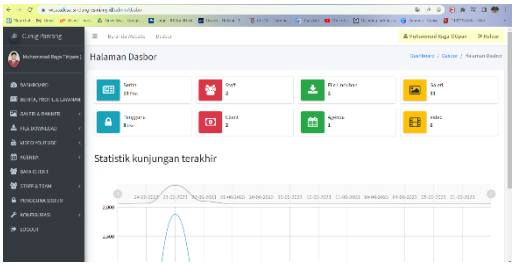

Figure 15. Administrator home page

Responsiveness and Affordability: The UI is designed to be responsive and easily accessible across various devices, such as computers, tablets, or smartphones. This ensures an optimal user experience without zooming in or out.

3. RESULTS AND DISCUSSION

The website-based village information system test scenario involves determining test cases that cover various system features and functionality. After that, testing is carried out according to predetermined case scenarios, recording test results, including the system's success in performing the functions tested, response time, access speed, ease of use, and overall performance.

The test results are analyzed to evaluate how the village information system achieves the stated goals, such as improving the quality of services and information and increasing community participation. The independent variable is developing a website-based village information system and the features implemented. In contrast, the dependent variable results from system testing, such as functional success, response time, access speed, and ease of use.

Several limitations may occur in working on a website-based village information system, such as limited infrastructure, human resources, sustainability and maintenance, community participation, and information security. It is essential to identify and overcome these limitations by carrying out careful planning, involving stakeholders, providing adequate training and technical support, and maintaining consistent sustainability and maintenance of the system.

3.1. Testing with User

Figure 16. Website launching and socialization.

Table 1. Web site main feature test

No	Page	Testing	Result
1	Article Page	Admin displays articles on the main page	succeed
2	Population Data Management	Admin input and delete Population Data	succeed
3	Request Letters from the Community	People send messages on self-service	succeed
4	Social Assistance Program	Admin displays several people who get government assistance	succeed
5	Log in to the Village Website	Login as admin/community	succeed
6	Tourism Website Login	Login as admin	succeed

7	Database	Admin input and delete data on the website, is the data connected directly to the server	succeed

Table 2. User acceptance test result

No	Question	Agree	No
1	Did you find the event informative and useful?	40	0
2	Did the event meet your expectations in terms of improving website-based services and information quality?	39	0
3	Did the event give you a better understanding of how digitization can benefit villages?	40	0
4	Did you feel involved and active during the event?	34	0
5	Does the event present practical examples of how website-based services and information quality can be improved?	38	0
6	Did the event inspire you to explore and use the village website more often?	35	0
7	Did the event address your concerns and questions regarding website-based services and information quality?	38	0
8	Did the event motivate you to provide feedback or suggestions for further improvement?	35	0
9	Do you feel that the event encourages collaboration and participation among villagers?	40	0
10	Did the event give you a positive impression regarding digitalization efforts in Sindangresmi Village?	40	0

4. CONCLUSION

Implementing a website-based village information system has great potential to improve service quality and access to information for village communities. This research shows that using a website-based village information system, data collection processes, information management, and service provision can be more efficient, well-documented, and easily accessible to the community.

However, this study also identified several challenges and limitations that need to be considered in developing and implementing village information systems. These challenges include limited infrastructure, human resources, sustainability and maintenance, community participation, and information security. To overcome this challenge, a holistic approach involves cooperation between the village government, the developer, and the community.

In a further development in the future, it is crucial to continue to increase the use of village information systems by taking into account input and feedback from the community. Further research can be conducted to optimize the user interface design, improve system security, integrate the system with other platforms, and expand the range of services offered. In addition, ongoing efforts to increase community digital literacy and active participation in using village information systems must also be the main focus.

In conclusion, developing a website-based village information system has great potential to improve service quality and access to information for village communities. However, challenges and limitations must be addressed proactively to achieve optimal results. Further development must pay attention to aspects that have yet to be covered and continue to adapt to technological developments and the needs of rural communities. Thus, a website-based village information system can continue to grow and provide significant benefits in improving the quality of life.

ACKNOWLEDGEMENTS

The author would like to thank the lecturers majoring in computer engineering who have guided and fostered the design of a solution to a case, as well as acknowledgment of sponsorship and financial support from the sindangresmi village.

REFERENCES

[1] J. E. Bourne. “Digitalization of rural India: digital village," *VISION: Journal of Indian Taxation*, vol. 7, pp. 88-93, 2020.
[3] R. Damara, “Pengalaman Menggunakan Aplikasi dan Fitur OpenSID Sebagai Basis Administrasi Desa,” 2018.
[4] M. U. Fahri, *Sistem Informasi Desa*, AMKI Ketapang, 2020.
[5] Jogloabang, *Sistem Informasi Desa*, 2015.
[6] W. Witono, “ Aplikasi berbasis website untuk booking Hotel Surya Andesa Klaten menggunakan framework Laravel dengan metode waterfall”, *eProceedings of Engineering*, vol. 10, no. 5, 2023.
[7] R. Pratama, H. D. Anggana, and L. Andrawina, “Perancangan sistem informasi manajemen berbasis website untuk peningkatan kepuasan pelanggan unit pelaksana teknis daerah industri pangan olahan dan kemasan menggunakan metode waterfall”, *eProceedings of Engineering*, vol. 10, no. 5, 2023.
[8] I. Nikmatul, P. Mohamad, Sulistiyawati, R. Liza, and M. Muhammad, “Pendampingan Digitalisasi Desa Berbasis Website Sebagai Upaya Meningkatkan Potensi Ekonomi Desa Parerejo Kecamatan Purwodadi,” *Soeropati*, vol. 3, no. 2, pp. 135-137,

2021.
[9] I. Fardani, G. P. Rochman, L. S. Akliyah, and H. Burhanuddin, " Digitalisasi desa di Cikole Lembang", *Resona*, vol. 5, no. 2, pp. 181-197, 2021.
[10] Z. Mustofa, M. I. Mustofa, " Sistem informasi desa berbasis web (studi kasus Desa Weding)", *Jurnal Teknologi Informasi dan Komunikasi*, vol. 9, no. 2, pp. 47-52, 2018.
[11] Herpendi, " Sistem Informasi Desa Di Kecamatan Takisung", *Jurnal Sains dan Informatika*, vol.3, no.2, pp. 76-82, 2017.
[12] Y. A. Binarso, E. A. Sarwoko, and N. Bahtiar, "Pembangunan sistem informasi alumni berbasis web pada Program Studi Teknik Informatika Universitas Diponegoro", *Journal of Informatics And Technology*, vol. 1, no. 1, pp. 72-84., 2012.
[13] V. Palanisamy and R. Thirunavukarasu, "Implications of big data analytics in developing healthcare frameworks – A review," *Journal of King Saud University - Computer and Information Sciences*, vol. 31, no. 4, pp. 415-425, 2019.