



Digital Transformation of Village Information Governance through a Next.js-Based Web System Integrated with Contentful Headless CMS

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Abstract.

Accessibility to public information remains a key challenge in strengthening transparency and accountability in village governance. Parit Village requires a digital platform that can support dynamic, efficient, and publicly accessible information services. This community service program aimed to design and implement an official village website using a modern web architecture. The system was developed using Next.js and Tailwind CSS to provide a responsive interface, improve user experience, and optimize page loading through server-side rendering. Content management was integrated with Contentful as a headless CMS, enabling the separation of presentation and data layers and allowing village officials to update information independently without modifying the source code. The implementation results show that the developed system successfully supports the real-time dissemination of village profile information, organizational structure, public announcements, and activity documentation. In addition, the program improved the digital literacy of village officials by introducing practical skills in web-based content management. This initiative demonstrates that the integration of Next.js and a headless CMS can serve as an effective model for improving digital information governance at the village level. Overall, the implementation contributes to more transparent, adaptive, and accountable public information services for the Parit Village community.

Keywords: Village Information Governance; Digital Transformation; Next.js; Headless CMS; Contentful

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INTRODUCTION

Accessibility to public information is a key pillar in realizing transparent and accountable village governance. In today's digital era, villages are required to be able to manage data and disseminate information quickly to the wider community. Digitalization enables faster, more transparent, and more accessible information delivery, which is crucial for modern administration (Hermawan, 2025). However, many villages still face obstacles in this process due to limited human resources, a lack of adequate technological infrastructure, and the persistence of manual documentation methods (Nurjanah, 2021).

The transition to a Village Information System (SID) is no longer just a technological trend, but rather a strategic necessity to improve the quality of public services and digital literacy among rural communities (Kurniawan & Saputra, 2022). Previous research has shown that a well-integrated digital platform can empower village officials to update data independently while providing a promotional platform for local potential, such as MSMEs (Santoso, 2020). Furthermore, the use of responsive web-based technology is key to ensuring information can be accessed through various devices, from computers to smartphones (Pradana, 2024).

To address these issues, the Community Service Program (KKN) offers a solution by developing the official Parit Village website using a *modern web stack*. The *Next.js framework* was chosen for its superior performance through its *Server-Side Rendering (SSR)* feature, which ensures web pages load quickly even in areas with unstable internet connectivity (Prasetyo et al., 2024). Furthermore, the integration of Contentful as a *Headless CMS* provides a user-friendly interface for village officials to manage dynamic content such as news and announcements without requiring advanced programming skills (Mulyanto, 2021).

METHOD

This community service activity was implemented through several systematic stages that adapted *the Software Development Life Cycle (SDLC)* to ensure the technical robustness and sustainability of the village information system. The stages began with a needs analysis through field observations and in-depth interviews with Parit Village officials to identify the key features required for the village website (Firmansyah, 2018). This process was crucial to ensure the technology developed aligned with the digital literacy level and administrative needs of the local village government (Nurjanah, 2021). Based on the analysis, a system architecture was designed using the *Headless CMS concept* to separate content management from the presentation layer, providing greater flexibility and security than traditional monolithic systems (Mulyanto, 2021).

The technical implementation phase involved building a user interface *using* the Next.js and Tailwind CSS *frameworks* to ensure optimal application performance and responsive design across multiple devices. Next.js was selected for its speed optimization capabilities through *Server-Side Rendering (SSR)*, which is crucial for accessibility in areas with limited internet connectivity (Prasetyo et al., 2024). Data integration was accomplished by connecting the system to the Contentful platform as a content provider through an *Application Programming Interface (API)*, which enables efficient data synchronization between the content cloud and the web application (Rahmadani & Wijaya, 2022). All source code was managed using the Git version control system and stored in a GitHub repository, which was then connected to the Vercel platform for automated, *real-time deployment*.

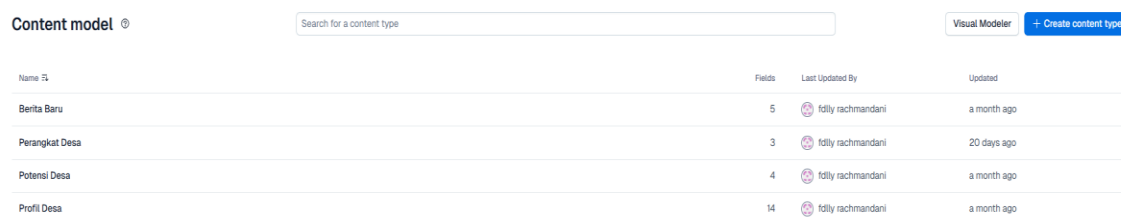
After the system is successfully implemented, the final stage is outreach and training for village officials. This training focuses on procedures for updating information, uploading news, and maintaining content on the Contentful *dashboard*. This is done to ensure the continued operation of the website independently by partners after the Community Service Program (KKN) ends (Hermawan, 2025). Evaluation is conducted by testing the functionality of the features and ease of access for general users to ensure that this information portal truly has a tangible impact on bridging the information gap in rural areas (Ramadhan & Ilham, 2024).

Manuscript can use the STROBE method for observational studies, SRQR for qualitative studies, PRISMA for reviews, CARE for case reports, CONSORT for clinical trials (**recommendations**).

RESULTS AND DISCUSSION

1. Data Structure and Content Management

In the initial phase, a data structure was built using *the Headless CMS Contentful*. Four main content models were designed to meet the information needs of Parit Village: Profile, News, Village Apparatus, and Gallery.



Name ↕	Fields	Last Updated By	Updated
Berita Baru	5	fdilly rachmandani	a month ago
Perangkat Desa	3	fdilly rachmandani	20 days ago
Potensi Desa	4	fdilly rachmandani	a month ago
Profil Desa	14	fdilly rachmandani	a month ago

Figure 1. Content Model Architecture on the Contentful Dashboard

2. Website Interface Implementation

The interface design using Next.js and Tailwind CSS produces a clean and responsive display. The main page provides a welcome message and navigation that makes it easy for the public to access village information services.

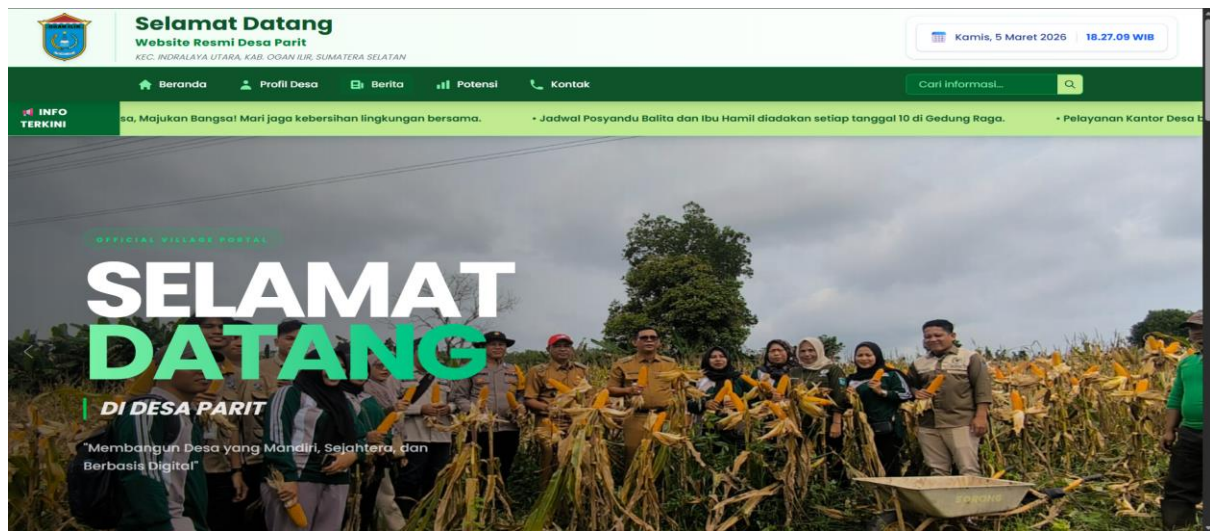


Figure 2. Display of the main page interface of the Parit Village website

3. Deployment and Publication Success

The website has been successfully deployed through the *Vercel platform*. Integration between *GitHub* and *Vercel* allows the system to perform automatic updates (*Continuous Deployment*) every time there is a change in the database or program code.

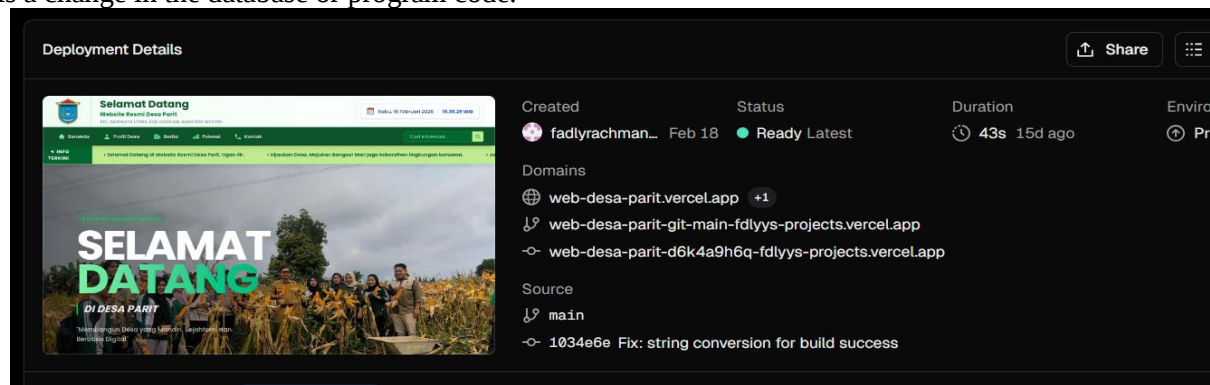


Figure 3. Status of successful system deployment on the Vercel server

4. Activity Documentation and System Handover

As a concrete form of dedication, a trial of the system's use has been conducted as well as coordination with village officials regarding independent content management for the sustainability of village information in the future.



Figure 4. Documentation of the development and coordination process for KKN activities in Parit Village

CONCLUSION

The Parit Village digitalization program through the development of an official website has successfully provided a strategic solution to the previously manual constraints of information transparency.

Through the implementation of a modern web architecture with the Next.js *framework* and the *Headless Contentful CMS*, the village now has a responsive, fast, and high-performance information platform that is equally accessible to the community. The success of the system development stages, from needs analysis to publication through Vercel, demonstrates that the integration of *cloud-based technology* can ensure technical efficiency and operational ease for village officials.

The results of this community service activity demonstrate that the official website is effective in disseminating village profiles, development activities, and local potential to the public in *real time*. Furthermore, the technical assistance provided has significantly improved the digital literacy of village officials in managing information assets independently and sustainably. For future development, it is recommended to add *online administrative service features* so that the website functions not only as an information medium but also as an integrated public service portal for Parit Village residents.

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AUTHOR CONTRIBUTION STATEMENT

P supervised the project and provided technical guidance. FR developed the information system and *Headless CMS* architecture. MIAR and DIR designed the activity materials and conducted field data collection. FR and MIAR drafted the original manuscript. All authors reviewed and approved the final manuscript for publication.

CONFLICT OF INTEREST AND FUNDING

There is no conflict of interest

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