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Implementation of Web based Civil Administration System for Citizen Unit Level

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Abstract

Civil administration system is an important system that supports e-government to improve the governance process. Unfortunately, many citizen-unit level in Indonesia still handle this process manually. This condition also happens in citizen unit no. 25, Melong Village, Cimahi, West Java. To solve this problem, a community service project by Telkom University is running to develop and implement the civil administration system for this citizen-unit. The community service team consists of lecturers and students. The system is developed based on web so that it can be accessed easily for the citizens. This system is also a mobile-friendly application so that the appearance is appropriate when it is accessed through smartphone. The main features are the demographic and financial data. The socialization was held on June 5, 2026. There are several issues regarding privacy, security, server, and additional features. All these issues have been addressed. To maintain the sustainability of the program, commitment for continuous improvement and implementation has been stated through capstone project, and submission for next funding.

Keywords: civil administration system, web technology, e-government

INTRODUCTION

E-government has become an important instrument of modernization for public administration system. It enhances transparency, accountability, and efficiency (Malodia et al., 2021). Moreover, the digital transformation of government system may provide other advantages including reduced response time, improved citizen satisfaction, and so on (Diniz et al., 2025). Citizen unit no. 25, Melong sub-district, South Cimahi District, is an area with significant social and economic potential. There are four neighborhood units. In total, there are 321 families with a population of 869 people. However, like most other areas in Indonesia, population data management in this area is still done manually, which can cause various problems. This manual process is due to the information systems currently available at the population and civil registry office level. Population data managed conventionally is often poorly organized, potential for errors, duplicate effort (Mian et al., 2025), and time-consuming. Conventional document storage also has the potential to result in data or document loss (Liu Jiazhen & Wang Jingxuan, 2010), increasing of maintenance cost (Gaceu et al., 2021), and limitation of accessibility (Iversen et al., 2015). Furthermore, manual data processing does not allow neighborhood units, citizen units, and sub-districts to quickly obtain the information needed for decision-making or development planning based on valid data. Furthermore, the accumulation of physical files makes the administrative process lengthy (Castro-Nagatomy et al., 2022).

Furthermore, there are large amounts of data that must be managed, such as population data, health status, education level, and other social aspects. This circumstance makes it difficult for neighborhood unit and citizen-unit level governments to make quick and targeted decisions regarding

these issues. Without an integrated system, the process of data verification and information updating becomes very challenging, especially when relying on manual methods that are prone to human error. In response to these challenges, there exists a need to contribute to providing a solution by developing a civil administration system that can be used by neighborhood unit and citizen unit (RT) officials including all people in this citizen unit. This application will facilitate the collection, management, and mapping of population data more efficiently, effectively, and transparently. Empowering these target partners has significant potential to increase the effectiveness of data management and streamline the decision-making process. With a more structured, technology-based system, neighborhood unit and citizen unit officials can monitor various aspects of community life, such as health, education, and economic levels. This information is also important to support government programs, such as social support, cash transfer, immunization, and the general election.

This application will facilitate real-time data management and verification for the unit officials. Furthermore, the application will speed up recording and reporting data to the sub-district, thereby improving government performance at the micro-level. This convenience will also impact public services, as unit officials can be more responsive to emerging issues. Another potential empowerment goal is to improve the technological capabilities of unit officials in managing and accessing data. Through training in application use, it is hoped that the officials will gain a better grasp of information technology, which they can use in their daily work. This will create a stronger digital culture at the local government level and improve the capacity of human resources in the region.

METHOD

The solution offered in this community service activity is the development and implementation of a civil administration system at the citizen-unit level. A web-based system was chosen because many similar systems have also been developed. Moreover, a web-based system provides additional advantages including real time access (de Sá, 2008), remote access (Meyer et al., 2023), cross platform (Herrero et al., 2011), and so on. This system is designed to address the main problems in population administration management, which are still carried out manually, unintegrated, and prone to recording errors and lost archives. Through a web-based system, all data collection and administrative processes can be structured, documented, and accessible at any time and from anywhere by authorized parties. The main feature of this system is the population data management module. Resident data will be stored in a centralized database that includes basic identity information, family status, address, occupation, and other relevant information as needed by the citizen-unit administration. Any data changes, such as births, deaths, new arrivals, or new departures, can be updated periodically by authorized administrators. With this centralized system, the risk of data duplication and information inconsistencies can be significantly minimized. In addition to the data collection module, this system provides an online administrative service application feature. Residents can select the type of service they require, such as a domicile letter, a certificate of poverty, a letter of application for a national identity card, a business certificate, or other documents typically issued by the citizen unit. After selecting the service type, residents are asked to fill out a digital form and upload the required supporting documents. The system will provide clear guidance on which documents must be attached, minimizing errors or missing files.

After the application is submitted, the system will automatically send a notification to the citizen-unit administrator that a new application needs to be processed. This notification can be an in-app notification or via email or text message, depending on the agreed configuration. The administrator can then verify the completeness and validity of the submitted data. If the documents are deemed complete and accurate, the administrator can digitally approve the application. Conversely, if deficiencies or errors are found, the administrator can provide correction notes that will be sent directly to residents through the system. The notification feature is a crucial component of this system. Every activity from application, request for correction, approval, to document completion, will generate an automatic notification to the relevant parties. With a real-time notification system, communication between residents and administrators is faster and more transparent. Residents can monitor the status of their applications directly through their respective account dashboards without having to manually inquire with the administrators.

All documents uploaded and generated by the system will be securely stored in a cloud storage service. The use of cloud technology offers several advantages, including improved data security,

flexible storage capacity, and easy automatic backups. Cloud-based storage significantly reduces the risk of data loss due to local device failure, disasters, or technical errors. Furthermore, the administrators do not need to provide expensive and complex physical server infrastructure for system management.

Data security and confidentiality are key considerations in the development of this system. Each user will have an account with username and password-based authentication, along with role-based access control. Sensitive data will only be accessible to authorized parties. Furthermore, data communication between users and the server will use a secure protocol (HTTPS) to prevent eavesdropping. The system can also be equipped with an activity logging feature so that every user action can be traced if problems arise. From a governance perspective, this system also provides automated reporting and data recapitulation features. Citizen-unit administrators can generate population reports based on specific categories, summarize letter submissions within a specific period, and provide statistics on the most frequently requested services. These reports can be downloaded in digital format, facilitating coordination with the sub-district or related agencies. With the availability of structured and easily accessible data, social program planning, aid data collection, and community activities can be carried out more effectively.

The implementation method for this community service activity uses a participatory and needs-based approach, where partners are actively involved from the initial stages through system implementation. This approach aims to ensure that the developed solutions truly align with the real conditions and administrative needs at the citizen-unit level. In general, the implementation phase is divided into five main stages: (1) needs survey, (2) system development by a team of lecturers and students, (3) system testing in the laboratory, (4) system implementation in the partner's environment, and (5) community outreach. The first phase is a needs assessment. During this phase, the community service team conducts direct observations within the neighborhood unit (RW) to identify actual problems in population data management and administrative services. The second stage is system development by a team of lecturers and students. Based on the results of the needs survey, the team began developing the system design, which includes architectural design, database design, user interface design, and business process flow. During this stage, students Participants were actively involved as part of project-based learning, under the supervision of lecturers. Tasks were structured, for example, the backend team was responsible for database management and system logic.

The third stage was system testing in the laboratory. After the system was functionally developed, a series of tests were conducted to ensure it ran smoothly and contained minimal errors. Testing took several forms, including functional testing to ensure each feature performed according to specifications, usability testing to assess the system's ease of use, and basic security testing to ensure data was protected from unauthorized access. The team simulated the application submission process by residents, the verification process by neighborhood association (RW) administrators, the issuance of notifications, and the storage of documents in the cloud. Any bugs or technical issues found were recorded and fixed before the system was implemented in the field. This phase aims to minimize the risk of technical disruptions during the system's use by partners.

The fourth stage is system implementation in the partner neighborhood associations (RW). At this stage, the tested system is installed and configured according to actual needs in the field. The team performs initial data migration, if necessary, for example, entering previously manual resident data into the digital system. RW administrators are given administrator accounts, while residents are given access to user account registration. In addition, administrators are provided with direct assistance in using the system, from population data management and the application approval process to report generation. During the initial implementation period, the community service team provides technical support to address any challenges that may arise. This approach ensures that partners do not experience difficulties or burdens in the transition from a manual to a digital system.

The fifth stage is community outreach. Outreach is conducted to ensure that residents understand the existence and benefits of the developed information system. Outreach activities can include community meetings, distribution of printed and digital user guides, and live demonstrations on how to submit applications through the system. The team also explained the notification mechanism, the verification process, and the benefits of using the system, such as time efficiency and transparency of application status. During this activity, residents were given the opportunity to try out the system directly with assistance. Effective socialization is crucial to ensure high system adoption and true community use.

RESULTS AND DISCUSSION

Through development process, this web-based civil administration system is operational. The cloud-based server is subscribed using community service funding. This application is designed as a mobile friendly application so that it can also be accessed through mobile-based web browser with appropriate layout. Citizens can register their accounts through the system directly. But verification and approval from the administrator is needed to make sure that the registrar is the citizen of the unit. After the verification is completed, the citizen becomes user and can log in. The login page of this system can be found on Figure 1.

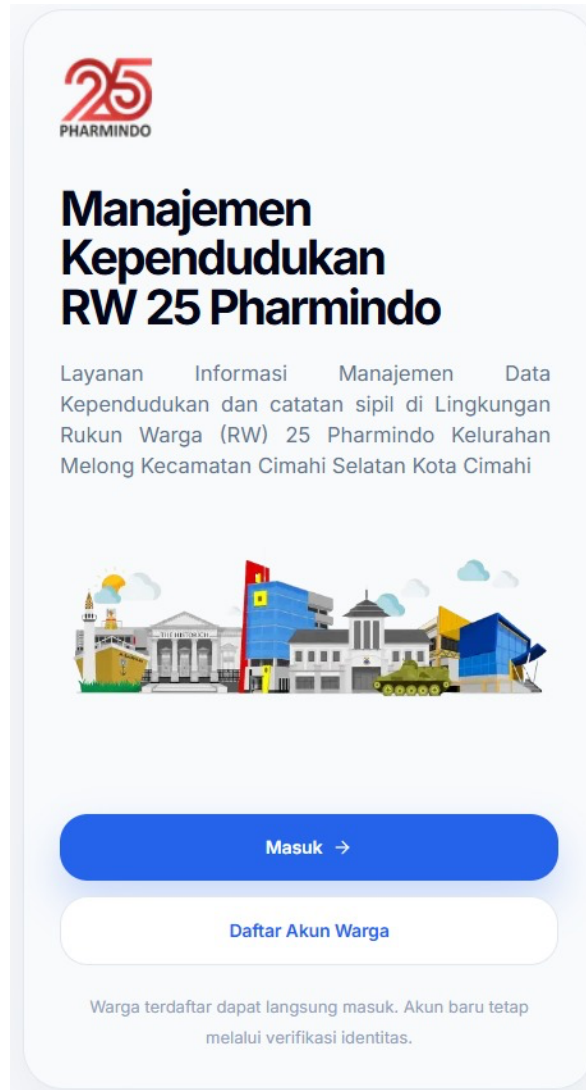


Figure 1. Socialization of the civil administration system

This application has two main user types: citizen-unit administrators as administrators, and neighborhood unit administrators and residents as service users. The administrators have access to manage population data, verify applications, grant approvals, or request document corrections. Meanwhile, neighborhood unit administrators and residents can access the system via computers or smartphones to submit online file processing requests and serve as data sources. Thus, this system not only improves the work efficiency of the administrators but also makes it easier for residents to obtain administrative services without having to visit the secretariat in person. After logging in, all users will be directed to the dashboard page. There is specific dashboard page for each role. The dashboard page provides general information regarding the system. Then, there are two types of additional interfaces.

The first type is the data entry page while the second type is reporting page. The data entry page is used for users to input data into the system. Meanwhile, the reporting page is used for users to access the report of the system, for example demographic and financial condition of the unit. The citizen user cannot access detailed information of other citizens as this is private data that can be accessed only by the user him/herself, unit officials, and administrators. The reporting page is found on Figure 2.

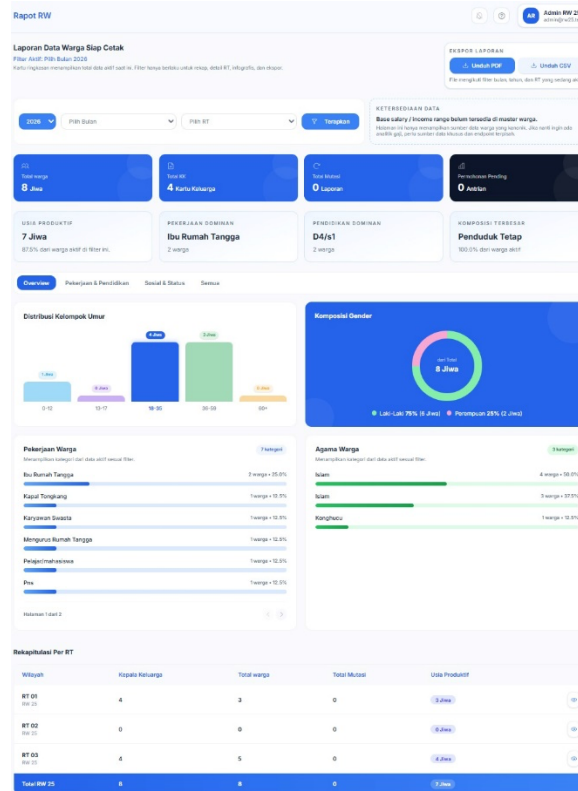


Figure 2. Reporting interface of the system

The socialization of the system was held on June 5, 2026. This socialization was conducted at citizen hall. This meeting was attended by the community service team members and the citizens of citizen-unit no. 5. The citizens include the general citizens, and the unit officials. The meeting was held in three sessions including the opening speech, presentation, and discussion. The documentation for this meeting is found on Figure 3.



Figure 3. Socialization of the civil administration system

There are several issues arisen from the discussion. The first issue is regarding the server where the data is stored. Team then explained that the server is in the cloud so that there is no need for the officials to provide any server. This cloud has been subscribed for five years using the community service fund. The second issue is about security of the data. This issue has been addressed by explaining

that there are several layers of data protection and security. The third issue is regarding the administrators. Based on the discussion, there will be two types of administrators. The first type is the citizen-unit level administrator while the second type is the neighborhood-unit level administrator. Both types of administrators should be appointed officially so that there are a clear appointment and responsibility regarding the handler of the data and system. The fourth issue is regarding data filtering. There is requested to add more filters for data during reporting.

This socialization was then concluded by a commitment for additional socialization. This additional socialization will be focused on the candidates of the administrators. This next meeting also will be more technical. There is also a commitment to make this program is sustainable. This sustainability is achieved through continuous improvement. The most important part is commitment of citizens to use this system. It is known that user engagement plays critical role in determining the success of any e-government system (Bakhov et al., 2025). In this context, the development of civil administration system will continue using several upcoming schemes. The first scheme is the utilization of capstone design course. More integrated system and additional features will be conducted by several capstone design teams. The second scheme is regarding the funding. The continuation of this program will also be submitted for next community service funding. To enhance the funding, the team will propose this program for external funding. Moreover, copyright of the system software will be submitted.

CONCLUSION

This paper has presented a community service program regarding the civil administration system for citizen unit level. The partner is the citizen-unit level of Melong Village, Cimahi, West Java province. This civil administration system is developed using web-based technology so that it is easy to operate. The socialization was held on June 5, 2026. In general, the citizens accept and commit to using this system. There are several issues arise regarding this system, including the data privacy and security, administrators, and additional features. All these issues have been addressed. Moreover, there is commitment to make this program sustainable by continuing the development and implementation of this system through several schemes including capstone project and submission for future funding.

DECLARATION OF GENERATIVE AI

The authors declare that no generative AI or AI-assisted technologies were used in the writing process of this manuscript.

CONFLICTING INTEREST STATEMENT

The authors states that there is no conflict of interest in the publication of this article.

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