Journal of Artificial Intelligence and Engineering Applications

Website: https://ioinformatic.org/

June 2026. Vol. 5. No. 3; e-ISSN: 2808-4519

Design and Development of a Website-Based Donation System for Usable Goods in Gama Pinang Urban Village (RW 03 Area) Using the Prototype Method

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Abstract

The donation of usable goods in RW 03 of Gama Pinang Village is still managed manually, which causes several problems such as difficulties in managing donation data, monitoring the availability of donated goods, managing donation information, and organizing the distribution process. This study aims to design and develop a website-based usable goods donation system for RW 03 so that the donation, data recording, and distribution processes can run more effectively and efficiently. The system development method used is the prototype method, which allows direct interaction between the developer and the user during the system refinement process. Data were collected through observation, interviews, and literature studies to obtain system requirements suited to the conditions of RW 03. The system was built using the Laravel framework, the PHP programming language, the MySQL database, and Bootstrap for the user interface. The results show that the developed system is able to integrate the management of donor data, donated goods data, recipient data, distribution data, as well as donation and distribution reports. The system also facilitates monitoring of the status of donated goods and the distribution process to recipients in need, making the donation process more efficient, transparent, and structured in supporting the social activities of the community in RW 03 of Gama Pinang Village.

Keywords: *Donation management, Laravel, Prototype, Usable Goods Donation, Website*

1. Introduction

Clothing is a basic necessity for every family. Over time, almost every household has items or clothes that are no longer used but are still in usable condition. The lack of structured management of these usable goods often causes a buildup of items in the RW 03 area, which not only makes storage space inefficient but also causes items to deteriorate before they can be distributed.

In RW 03 of Gama Pinang Village, the activity of donating usable goods has not run optimally because the processes of data recording, handover, and distribution of donations are still carried out manually and without proper structure. This condition results in many usable items not being distributed appropriately and makes it difficult for RW 03 administrators to monitor the number of available donated goods.

The implementation of information technology, particularly website-based platforms, can be a solution by providing a platform that makes it easier for donors to make donations more quickly, transparently, in a structured manner, and efficiently Therefore, a website-based usable goods donation system was developed for Gama Pinang Village in the RW 03 area using the prototype method. The prototype method is a development approach that begins with building an initial model, which is then evaluated and improved gradually to match user needs [1]

Several previous studies have discussed similar topics. Study [2] designed an integrated information system for donation and bartering of goods based on a website, whereas this study focuses solely on the management of usable goods donations without a bartering feature. Study [3] developed a community-based goods donation information system using the waterfall method, which differs from this study that uses the prototype method to be more flexible in adapting to user needs. Study [4] developed a web-based donation application using the prototype method that directly involves users in the development process, while this study focuses on the scope of usable goods donation management in RW 03. Study [5] discussed a donation management information system at an orphanage to improve transparency, whereas this study focuses on the management of goods donation and distribution at the RW level. Study [6] discussed a web-based goods donation system using the scrum method with direct distribution to recipients, which differs from this study that uses the prototype method.

Based on the above description, this study aims to design and develop a website-based usable goods donation system for RW 03 of Gama Pinang Village so that the donation process can run in a structured manner, to facilitate the recording and management of donated goods, and to assist administrators in monitoring the quantity, type, and availability of donated goods so that the distribution process can run more effectively and efficiently.

2. Research method

This study used data collection methods consisting of observation, interviews, and literature studies. Observation was carried out by directly examining the current process of recording and managing donations in RW 03 of Gama Pinang Village to identify the workflow and obstacles encountered. Interviews were conducted with RW 03 administrators and several residents involved in donation activities to explore the needs and expectations regarding the system to be developed. Literature studies were carried out by reviewing books, journals, and previous research related to information systems, goods donation, websites, and the prototype method.

The system development method used is the prototype method, which allows direct interaction between users and developers through an initial model of the system to be built. The stages oMLMf the prototype method in this study consist of: (1) requirements gathering through observation, interviews, and literature review to determine the features and functions needed by users; (2) initial design of the user interface using Figma; (3) building an interactive prototype so that users can see a simple flow of system usage; (4) evaluation of the prototype by users to obtain feedback regarding the display and suitability of features; (5) refinement of the prototype based on the evaluation results until it matches user needs; and (6) implementation of the actual system using the Laravel framework based on the design and flow that have been approved [7] [8] [1].

Fig. 1: Flow of the current (manual) donation system

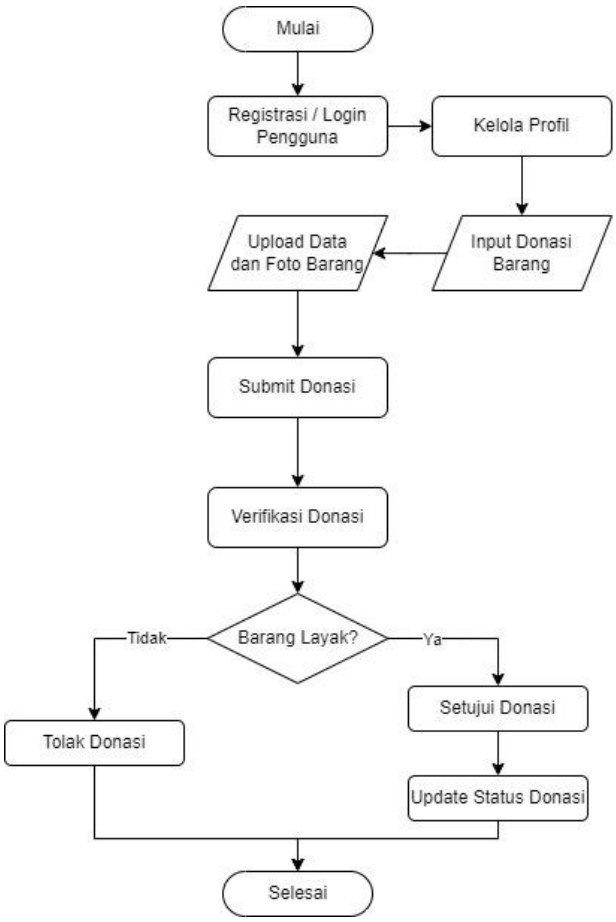

Fig. 2: Flow of the proposed website-based donation system

The system was designed using the Unified Modelling Language (UML) to describe the business processes of the system, as well as an Entity Relationship Diagram (ERD) that was transformed into a Logical Record Structure (LRS) to design the database so that the data is systematically structured and interconnected [9], [10]. The system was built using the Laravel framework with the PHP programming language, a MySQL database, and Bootstrap for the user interface to make the display more responsive across various devices [11], [12], [13]. System testing was conducted using the black box testing method with the cause-effect relationship technique to validate the system's functionality without examining the internal structure of the program code [14], [15]

3. Results and discussion

3.1. Analysis of the current and proposed systems

In the current system, the process of donating usable goods in RW 03 of Gama Pinang Village is still carried out manually, starting from the collection of goods, recording, up to the reporting of donation distribution using physical documents, as shown in Figure 1. Donors who wish to donate must first contact the administrators or come in person, after which the administrators manually record the donation data in a notebook. Once the items have been collected, the administrators distribute the donations to recipients and prepare a report in the form of handwritten notes that are only submitted to the Head of RW 03. The problems that arise in the current system include difficulties in conveying donation information and reports, low efficiency in collecting donations, and minimal management of donation data because it is not stored in a single system.

The proposed system, as shown in Figure 2, was designed to integrate the entire donation process within a single website-based platform, starting from donor registration, donation data input, verification by administrators, up to the distribution of goods to recipients. The main features for donors include registration and login, profile management, donation item input with photo upload, and donation history along with its current status. The main features for administrators include a donation summary dashboard, a dedicated admin login, user data management, donation data management, verification of donated item eligibility based on uploaded photos, donation distribution management, recipient data management, and donation and distribution reports that can be printed in PDF format for monitoring and evaluation purposes.

3.2. Use case and database design

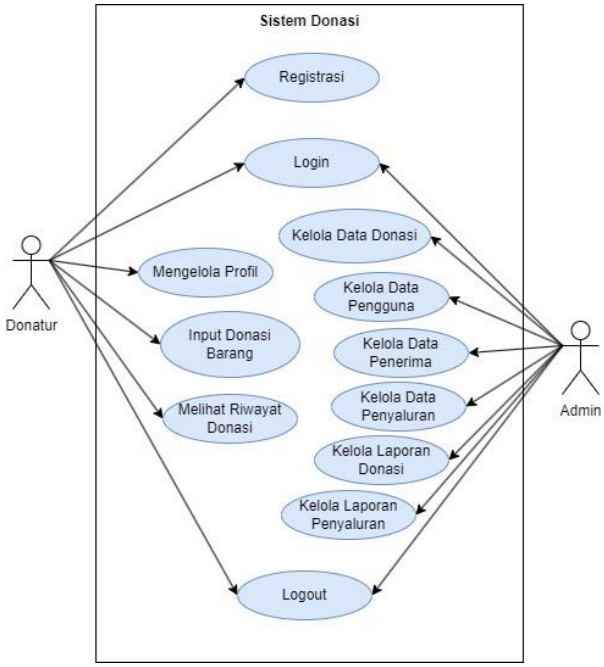

Fig. 3: Use case diagram of the Donasiku system

Figure 3 shows the use case diagram of the Donasiku system, which illustrates the interaction between two main actors, namely the donor and the admin. The donor can register, log in, manage their profile, input donation items, and view donation history. The admin can manage donation data, user data, recipient data, distribution data, as well as donation and distribution reports.

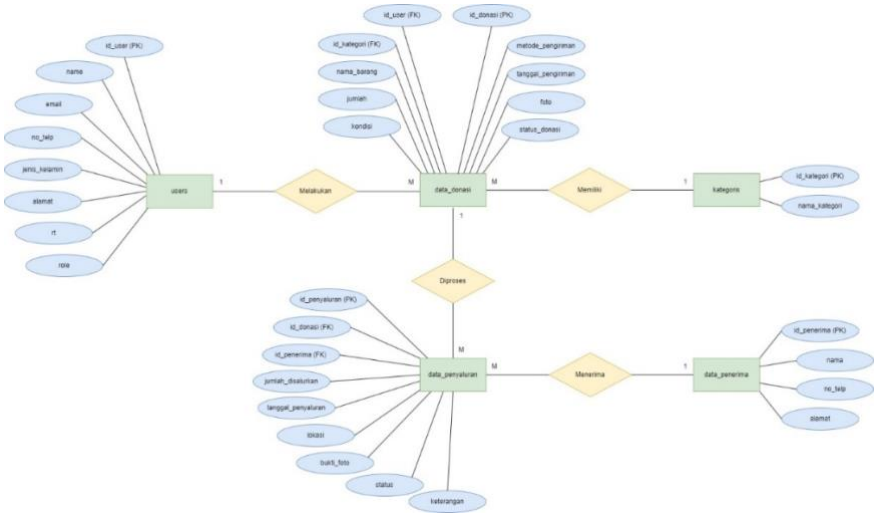

Fig. 4: Entity Relationship Diagram (ERD) of the Donasiku system

The database design of the donation system, as shown in Figure 4, consists of five main entities, namely users, kategoris (categories), data_donasi (donation data), data_penerima (recipient data), and data_penyaluran (distribution data), which are interconnected through primary keys and foreign keys. The users table stores user data such as name, email, phone number, gender, address, neighborhood unit (RT), password, and role as the access right (admin or donor). The data_donasi table stores donated item data such as category, item name, quantity, condition, delivery method, delivery date, photo, and donation status. The data_penerima table stores recipient data, while the data_penyaluran table records the distribution process of donated items from donors to recipients, including the distribution date, location, photographic evidence, status, and remarks. The relationships between entities are one-to-many, namely from users to data_donasi, from kategoris to data_donasi, from data_donasi to data_penyaluran, and from data_penerima to data_penyaluran [10].

3.3. System implementation

System implementation was carried out by applying the results of the interface design, database, and system functions into a web-based application called “Donasiku”, which was developed using the Laravel framework and a responsive Bootstrap-based user interface [13].

Fig. 5: Landing page of the Donasiku application

Figure 5 shows the landing page of the system, which contains information about the purpose of the platform, an invitation to donate, and navigation buttons leading to the login and registration pages.

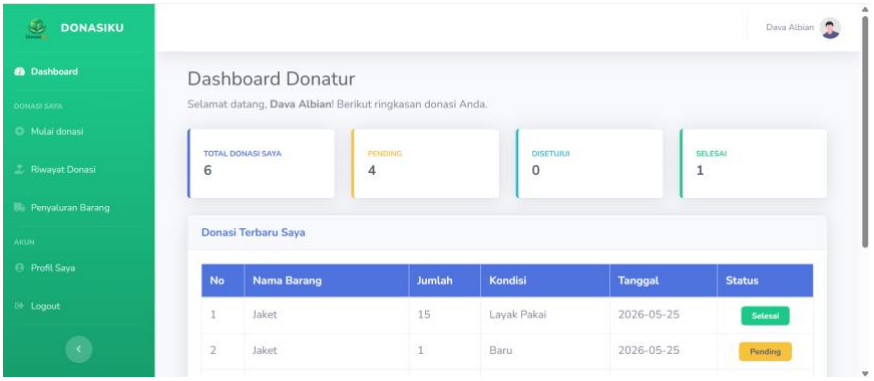

Fig. 6: Donor dashboard

Figure 6 shows the dashboard on the donor side, which contains a summary of the number of donations and activity history. Donors can fill in the data of the items to be donated along with photo uploads, view the status of each submitted donation, monitor the transparency of the distribution process to recipients, and manage their personal data and password through the profile page.

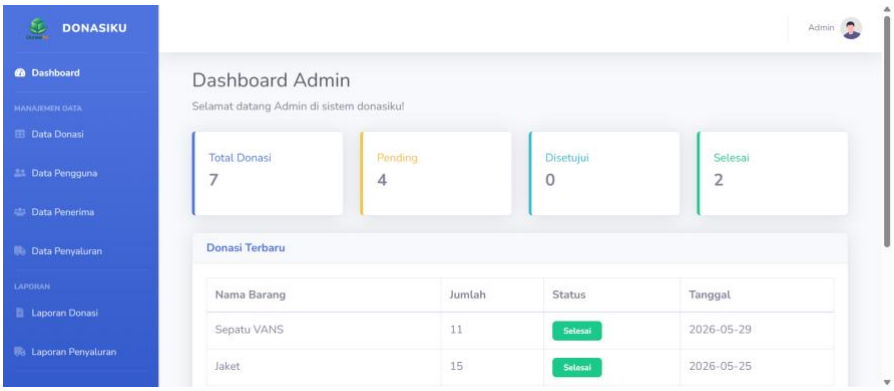

Fig. 7: Admin dashboard

Figure 7 shows the dashboard on the admin side, which contains a summary of donated item data. The admin can verify, edit, and delete donation data, manage user and recipient data, record the item distribution process along with photographic evidence in the distribution data, and print donation and distribution reports in PDF format.

Fig. 8: Donation report in PDF format

Figure 8 shows the donation report page, which can be filtered by neighborhood unit (RT) and printed in PDF format as documentation and for reporting to the RW 03 administrators

3.4. System testing

System testing was conducted using the black box testing method with the cause-effect relationship technique to comprehensively validate the application's functionality, covering the registration, login, donated item data management, donation recipient data management, donated item distribution, and donation and distribution report features. Testing was carried out by providing input to each feature and comparing the resulting output with the expected output based on the requirement specifications. The test results show that all of the system's main features ran in accordance with the prepared test scenarios, so that this website-based usable goods donation system is considered suitable for use in supporting donation management in RW 03 of Gama Pinang Village.

4. Conclusion

Based on the results of the research and development of the website-based usable goods donation system using the prototype method, it can be concluded that the system designed and built for RW 03 of Gama Pinang Village has proven to make the donation and distribution process easier and more structured. The digitalization of the recording and management of donated items, recipient data, distribution data, and donation reports helps minimize data loss that was previously managed manually by the RW 03 administrators. The use of the admin dashboard also makes it easier for administrators to monitor donation data and item availability in real time, making the distribution of donated items more effective, efficient, transparent, and well-targeted for the community in need.

For future development, it is recommended to add an automatic email notification feature so that donors can immediately know the latest status of their donations in real time, to develop a mobile-based application so that administrators can monitor donation data more easily, and to expand the scope of the system's use beyond RW 03 to the village (kelurahan), sub-district (kecamatan), and even city level.

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