

DESIGN OF A WEB-BASED PUBLIC SERVICE INFORMATION SYSTEM IN RONGGA DISTRICTFathur Rahman Atqiya¹, and Sidik Baehaqi²¹ Mercusuar College of Informatics and Computer Management, Bekasi, Indonesia² Mercusuar College of Informatics and Computer Management, Bekasi, Indonesia**Corresponding Author:**Fathur Rahman Atqiya,
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2026**Abstract**

Advances in information technology are driving various government agencies to digitize public service delivery. Rongga District, as an administrative area in West Bandung Regency, still faces various obstacles in providing public services. Service data management is still done manually using simple applications such as Microsoft Word and Excel, resulting in slow and inaccurate administrative processes. Furthermore, most services still require the public to visit the Rongga District office in person. This research aims to design and build a website-based public service information system in Rongga District. The system was developed using the PHP programming language with the Laravel framework, supported by HTML, CSS (Tailwind), and JavaScript on the frontend, and MySQL as the database. The system development method used the waterfall model, encompassing the stages of requirements analysis, system design, implementation, and testing using blackbox testing. The results indicate that the designed and built web-based information system can improve public services in Rongga District and facilitate public access to services. The system provides online submission features, application status tracking, a complaints system, and digital reporting. Admins can manage the entire service process, while the public can access and request services without having to visit Rongga District in person.

Keywords: Effectiveness, Efficiency, Information System, Public Service, Rongga District, Website

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INTRODUCTION

The rapid development of information technology in the contemporary era has transformed almost every aspect of human life, including the way public institutions deliver services to the community (Susanti dkk, 2024). Digital innovation has enabled organizations to improve efficiency, enhance productivity, and expand access to information without the constraints of space and time. Government institutions, in particular, are expected to adapt to this transformation in order to meet increasing public demands for fast, accurate, and transparent services. The integration of information systems into administrative processes is no longer a luxury but a necessity to ensure that governance is responsive and accountable in the digital age.

In the context of local government administration, the Rongga District Office faces significant challenges in managing administrative service data (Fiyan & Marta, 2023). Although computers are already used in certain activities, the applications employed remain simple and limited in functionality. Most processes are still carried out manually, and data management is decentralized across different sections without an integrated system. As a result, officers often experience difficulties in coordinating information, verifying documents, and generating reports efficiently.

The persistence of manual and semi-digital processes has led to several operational inefficiencies. Service delivery often experiences delays because staff must search for physical documents or re-enter data repeatedly (Budiarto dkk, 2023). Data retrieval becomes time-consuming due to the absence of a centralized database. Moreover, the lack of integration between departments increases the risk of data duplication and human error. These issues not only burden administrative staff but also affect the quality of services received by the community.

From the public's perspective, these inefficiencies manifest in the form of long queues, extended waiting times, and limited access to information regarding administrative procedures (Zikra dkk, 2025). Residents are required to visit the district office in person for almost every service request, regardless of the simplicity of the process. This situation is particularly inconvenient for those living far from the office or those with limited mobility. Consequently, there is an urgent need for innovation that can bridge the gap between public expectations and the current service system.

Based on these challenges, this research was conducted to design a web-based information system aimed at streamlining public services in Rongga District (Mulyadi & Karokaro, 2024). The proposed system is expected to integrate various administrative functions into a single digital platform that can be accessed anytime and anywhere. By utilizing web technology, the system would allow citizens to submit applications, upload required documents, and monitor the status of their requests online without having to physically visit the office.

The implementation of a web-based system is anticipated to improve efficiency by automating data processing and minimizing repetitive manual tasks (Johansyah, 2025). Through a centralized database, information can be stored systematically and retrieved quickly when needed. This would significantly reduce processing time, prevent data redundancy, and

enhance the accuracy of administrative records. In addition, automated report generation would support better decision-making and performance evaluation within the district office.

Furthermore, transparency and accountability are expected to increase through the availability of real-time information (Ernungtyas dkk, 2024). Citizens would be able to track the progress of their applications, receive notifications regarding requirements or approvals, and access clear guidelines about procedures and service standards. This transparency not only builds public trust but also reduces opportunities for miscommunication or procedural ambiguity.

In developing the system, a comprehensive design process is essential to ensure that the final product aligns with user needs and organizational objectives. According to Fauzi et al. (2022), design is a process or stage for creating or planning something using specific techniques to formulate the objectives to be achieved (Noor dkk, 2025). This definition emphasizes that design is not merely about creating a product, but about strategically planning how the product will function to accomplish predetermined goals effectively.

Similarly, Destriana et al. (2020) explain that system design is the activity of designing and determining how to process an information system based on the results of system analysis so that it can meet user needs (Budi dkk, 2025). This includes designing the user interface, managing data structures, and defining process activities. In the context of this research, system design involves translating administrative workflows into digital processes, structuring databases to accommodate various service types, and creating an intuitive interface that can be easily used by both staff and citizens.

Therefore, this research not only focuses on technological development but also on aligning the system with organizational workflows and community expectations (Indiati dkk, 2022). By combining systematic analysis, thoughtful design, and appropriate web technology, the proposed information system is expected to transform public service delivery in Rongga District. Ultimately, the system aims to create a more efficient, accurate, transparent, and citizen-centered administrative environment that supports good governance in the digital era.

RESEARCH METHOD

This paper utilized several methods for data collection, namely interviews, conducted with Rongga sub-district officers or staff to gain an in-depth understanding of system requirements, challenges faced by manual system users, and expectations for the features to be developed; observations, conducted directly in Rongga Sub-district to study the public service flow, identify weaknesses in the manual system, and record ongoing administration; document analysis, involved the collection and analysis of documents held by Rongga Sub-district, such as service data, administrative reports, and community data, to understand the data and information needs that will be integrated into the system.

These methods were used to gain a comprehensive perspective in designing a web-based public service information system. To explore the scope of the research and avoid overstating the problem, the system was defined as follows:

There are two main types of users: Admin and User (Community); admins can manage service data, process services, and submit service reports submitted by the community; users must first create an account to create services, view service history, and file complaints; the system was developed using the Laravel framework with a MySQL database and a Bootstrap-based interface; the development method used is the waterfall model, encompassing the stages of analysis, design, implementation, testing, and maintenance; system testing was conducted using the Blackbox testing method to obtain good results before full implementation.

According to (Supiyandi et al., 2022), the waterfall model is the most widely used model for the development stage. This waterfall model is also known as the traditional model or the classic model. The waterfall model is often called the linear sequential model or the classic life cycle. This waterfall model provides a sequential approach to software lifecycle development, starting with analysis, design, coding, testing, and support.

The waterfall model is an example of a plan-driven process. You must plan and schedule all process activities before starting work on them. The main stages of the waterfall model directly reflect the fundamental activities; system Analysis and Definition: This stage defines the system's services, constraints, and objectives in consultation with system users. They are then finalized; system and Software Design: The system design process allocates the required hardware or software for the system by establishing the overall system architecture. Software design involves identifying and describing the abstractions of the software system; implementation and Unit Testing: This stage presents the software design as a set of programs or program units. Unit testing involves verifying that each meets its specifications; integration and System Testing: In integration and system testing, individual program units or programs are integrated and tested as a complete system to ensure that the software requirements are met. After testing, the software system is delivered to the customer; operation and Maintenance: This is the longest phase of the lifecycle. The system is installed and delivered to practical users. In detail, this serves as the system specification.

In the system design process, several tools can be used to visualize how the system will work before implementation, such as UML, Use Case Diagrams, Activity Diagrams, Class Diagrams, and Sequence Diagrams, which help to describe the processes, interactions, and structure of the system more clearly and systematically.

According to (Lutfiah & Fitrah Eka Susilawati, 2024), UML is a language used to specify, visualize, build, and document information systems. UML was developed as a tool for object-oriented analysis and design by Grady Booch, Jim Rumbaugh, and Ivar Jacobson. Unified Modeling Language (UML) is a general-purpose notation language for specifying and visualizing complex systems, especially for large, object-oriented projects. From the definition above, UML, or Unified Modeling Language, is a general-purpose visual language used to describe, visualize, build, and document a system. UML is used to understand, design, configure, maintain, and control information about a system. (Peminjaman et al., n.d.)

A use case diagram is a use case diagram used to concisely describe who uses a system and what it can do ("Farming Based Rice" 2024). Use case diagrams are used to describe what a system should do. Use cases work by describing typical interactions between a system's users and the system itself through a narrative of how the system is used. Use case diagrams illustrate the expected functionality of a system.

According to (Widiyanto & Nugroho, 2024), an activity diagram depicts the workflow or activities of a system, business process, or menu within the software. Activity diagrams are used to illustrate the sequence of activity flows, both business processes and use cases. Activity diagrams can also be used to model the actions that will be performed when an operation is executed, and to model the results of those actions.

A class diagram is a type of UML diagram used to depict the class structure and relationships between classes in a system. This diagram shows the classes in the system, the attributes of each class, and the methods those classes can perform. A sequence diagram is a type of diagram in UML that describes object interactions in a chronological order. Sequence diagrams can also illustrate the sequence or stages that must be carried out to produce something, such as in a use case diagram.

Implementation tools are devices, methods, or techniques used to simplify and increase the effectiveness of the process of implementing a plan or system. These tools can be software, tools, templates, or specific management methods that help ensure implementation follows the plan. Visual Studio Code (VS Code) is a lightweight and powerful source code editor

developed by Microsoft. It is designed to increase development productivity with various features such as syntax highlighting, autocompletion, an integrated terminal, debugging tools, and version control integration like Git.

Laravel is an open-source PHP framework used to build web applications. Laravel is designed to simplify the web application development process by providing various built-in features and ready-to-use components, such as Model-View-Controller (MVC) and a command-line interface (CLI). MySQL is an open-source relational database management system (RDBMS) used to store, manage, and access data in tabular form. MySQL uses structured query language (SQL) to perform operations on data.

Xampp is open-source web server software used to develop and test web applications locally on a computer. This allows you to build and test websites without uploading them to a remote web server. Xampp stands for X (crossplatform), A (Apache), M (MySQL/MariaDB), P (PHP), and P (Perl). Bootstrap is an open-source front-end framework used to build websites and web applications with responsive designs and attractive appearance.

RESULTS AND DISCUSSION

DESIGN AND IMPLEMENTATION

1.1 System Design

System design is a crucial stage in system development because it determines how the system will be built based on the requirements analysis. At this stage, visual and structural designs are created as implementation guidelines, ensuring the system meets user needs, is efficient, and easy to develop.

1. Usecase Diagram

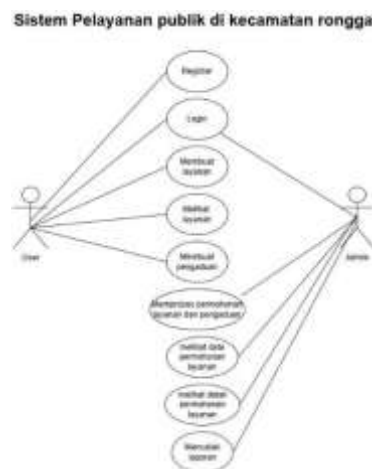


Figure 1. Usecase Diagram

The Use Case Diagram above illustrates a system design involving two types of users: Admin and User, where each actor has different access and functions within the system.

2. Activity Diagram

a) User Service Activity

The user application activity diagram above illustrates the process flow for submitting an online public service request, starting from the user's application submission, data verification, application processing, validation, and sending a notification of the application status to the user, allowing the user to effectively monitor the status of their application.

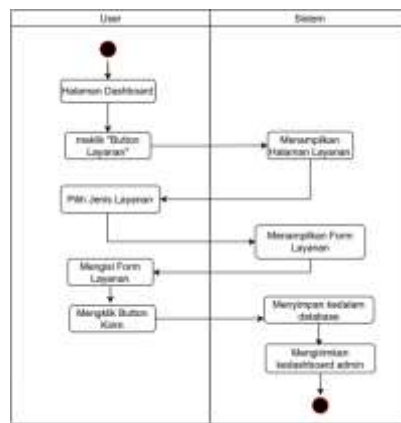


Figure 2. User Service Activity Diagram

b) User Complaint Activity

The user request activity diagram above illustrates the process flow for submitting an online public service request, starting from user submission, data verification, application processing, validation, and sending a status notification to the user, allowing users to effectively monitor the status of their request.

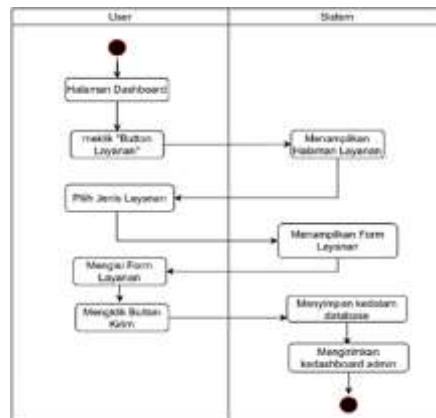


Figure 3. User Complaint Activity

c) Admin Processing Activities

The activity diagram for user request processing by the admin illustrates the admin's process in processing user requests, from receiving the request, data verification, validation, processing, and sending a request status notification to the user, ensuring that the request can be processed effectively and efficiently by the admin.

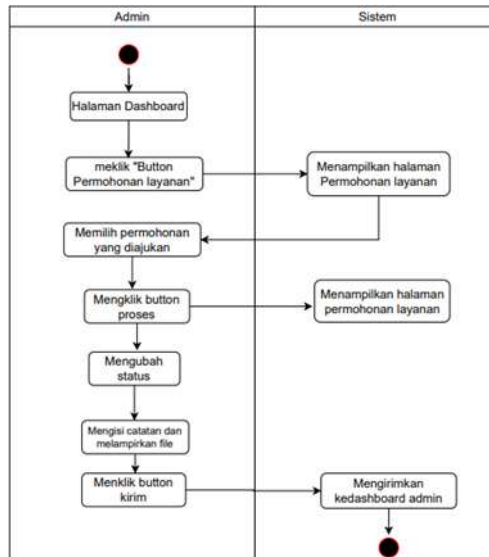


Figure 4. Admin Processing Activity

d) Admin Report

The admin report activity diagram illustrates the admin process for creating a report, from selecting the report type, displaying relevant data, filtering data based on specific criteria, generating an accurate and effective report, to importing the report into the desired format and sharing the report with authorized parties, ensuring the admin can generate the report effectively, accurately, and timely.

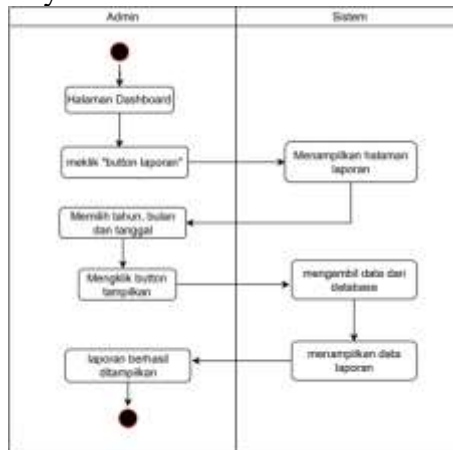


Figure 5. Activity Diagram of Admin Report

3. Sequence Diagram

Based on the use case diagram above, the sequence of activities of the actors in the web-based public service information system can be depicted as follows:

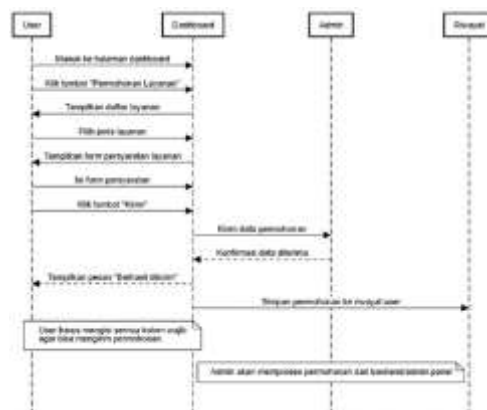


Figure 6. User Service Sequence Diagram

The sequence diagram above illustrates the flow of a user's service request, starting with accessing the service page, then filling out the required form. Afterward, they submit their request through the website.

This process then proceeds to a system validation process to check the completeness and accuracy of the data. If the submitted data is deemed valid, the system will send it to the admin and store it in the database, thereby recording the request in the user's request history. However, if the data is invalid, the system will display an error message prompting the user to correct the input. If the request is successful, the user will be redirected to the public service page, confirming the successful service request. This diagram thus illustrates all interactions between system components within an efficient and systematic service request process.

4. Class Diagram

The class diagram was designed to create the database, interface, and their relationships in the Public Service Information System design in Rongga District, which can be illustrated as follows:

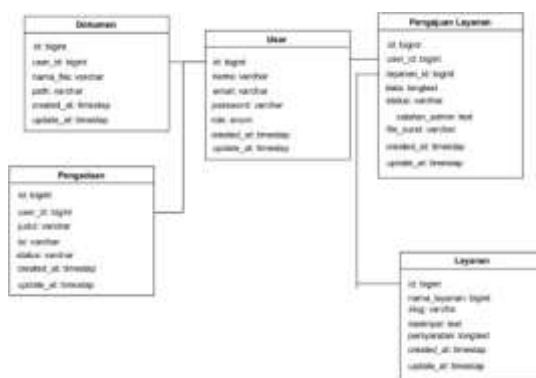


Figure 7. Class Diagram

This class diagram illustrates the database structure of a public service information system, consisting of several main classes: users, who can submit service requests, upload documents, and file complaints. Each request is linked to a specific service with specific requirements. All entities are interconnected through relationships based on user_id or service_id to ensure data integrity and interrelationships between processes within the system.

3.2 Implementation

1. Interface Design (Home Page)

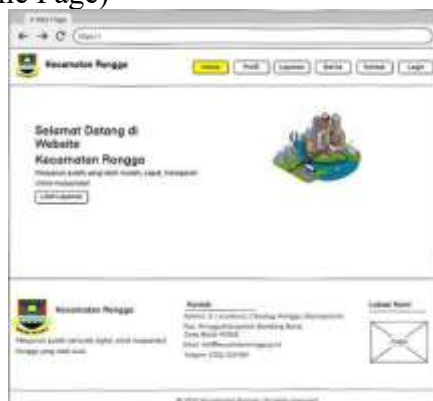


Figure 8. Home Page

This image shows the homepage of the Rongga sub-district website, which displays the main welcome, menu navigation such as Profile, Services, News, and Contact, access buttons to digital public services, and contact information and the sub-district's location to facilitate fast, easy, and transparent service access for the public.

2. User Services Page

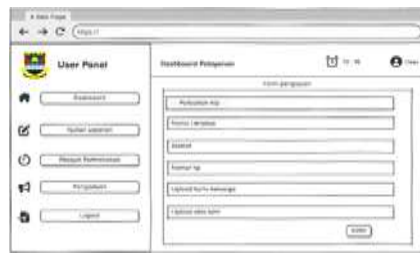


Figure 9. Service Pages

The “Submit Services” page in the user dashboard on the Rongga sub-district website was created to make it easier for the public to access and submit various types of public services digitally, starting with a dropdown display to select the type of service such as KTP repair, KK creation, moving letter, SKCK, SKTM, and others, then continuing with the application form consisting of data input such as full name, address, cellphone number, as well as the feature to upload supporting documents such as family cards and birth certificates, and ending with the “Send” button to submit the application, all of which are designed systematically, efficiently, and user-friendly so that the service process is fast, transparent, and well-documented.

3. Admin Processing Page

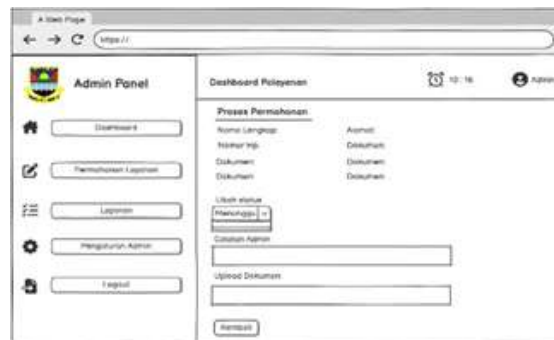


Figure 10. Admin Processing Pages

This page displays a list of all service requests entered into the system. Admins can monitor requests based on their name, service type, processing status, submission date, and take further action. On this page, there's a details button that displays complete information regarding a specific service request. Admins can view all the data entered by the applicant, including any uploaded supporting documents. Admins process service requests administratively. They can change the status, add notes, and upload additional documents as proof of completion.

4. Report Page



Figure 11. Report Pages

This page is used by the admin to process public service requests that have been entered into the system. Admins can check request data by year and month as part of the administrative

process. They can also print reports to submit to the sub-district head to monitor the number of service requests in Rongga sub-district.

1. Analysis of Results and Implementation

The web browser-based system displays two main pages: the Admin page and the Member page, with the following menus:

1. Home Page



Figure 12. Home Page

The Rongga District website's homepage is the first page visitors see when accessing the website. This page serves as the entry point and navigation center, providing an overview of the website's content and offering quick access to other important sections. The homepage contains several navigation options, including profile, services, news, and contact information. The initial page displays a welcome message.

2. Registration Page

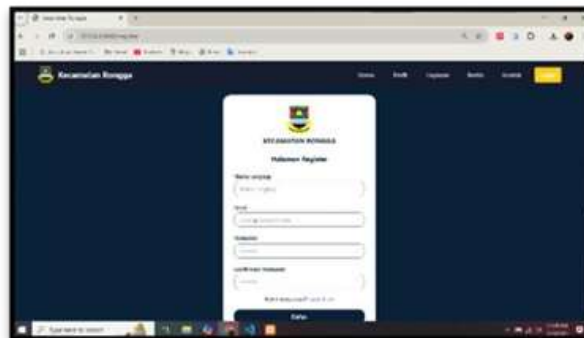


Figure 13. Register Page

The Rongga District Registration page provides a simple registration form with fields for name, email, password, and password confirmation. It also includes a "Register" button and a link to the login page for registered users.

3. Login Page



Figure 14. Login Page

The Rongga District Login page provides a simple login form with email and password fields, as well as a "Login" button to access the user dashboard.

4. User Services Page

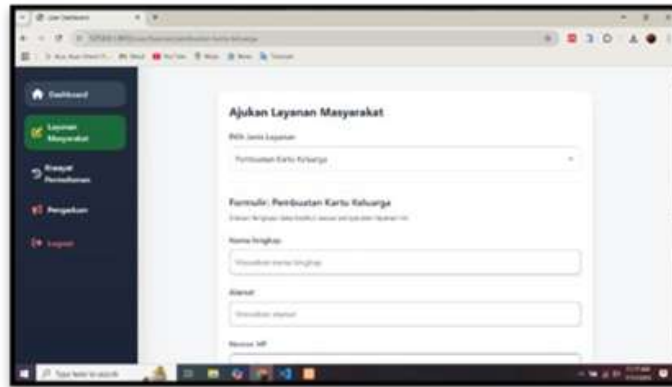


Figure 3. 15 Service Page

The public service page is a page that users can access to create service requests. Users must first select the service they wish to create. After selecting a service, a service form will appear. Users must complete all required fields. Afterward, the request will be sent to the admin dashboard.

5. Admin Processing Page

No	Nama Pemohon	Layanan	Tanggal	Status
1	Eka	Perubahan KTP	17 Aug 2024	Selesai
2	Lulu	Pengantar KTP	11 Jan 2024	Baru
3	Eka	Perubahan KTP	17 Jan 2024	Selesai
4	Eka	Perubahan KTP	17 Jan 2024	Selesai
5	Lulu	Pengantar KTP	11 Jan 2024	Baru

Figure 16. Report Page

The Report Page allows admins to process and review service requests submitted to the sub-district head to monitor the number of service requests in Rongga Sub-district.

CONCLUSION

The author concludes that the Public Service Information System Design in Rongga District aims to simplify and expedite the digital management of public services. The following conclusions can be drawn from this design the web-based information system was successfully designed to provide a public service system for Rongga District, facilitating online access for the public without having to visit the Rongga District office in person.

This system has a centralized, digital database, facilitating data retrieval and report generation for Rongga District officials, while minimizing errors in recording reports. This system not only covers KTP (ID card) issuance services but is also developed to support other administrative services such as Certificates of Poverty, Transfer Letters, and public complaint services, making them more efficient, fast, and transparent, thereby improving the overall quality of public services in Rongga District.

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