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Design and Development of a Web-Based Public Information System for Community Complaint Services at the Regional House of Representatives (DPRD) of West Java Province

Anggia Putri Deniyanti[1], Rini Suwartika Kusumadiarti[2], Candra Mecca Sufyana[3]
[1]Politeknik Piksi Ganesha, Bandung, Indonesia, anggiaputrideniyanti@gmail.com
[2]Politeknik Piksi Ganesha, Bandung, Indonesia, rini.suwartika@piksi.ac.id
[3]Politeknik Piksi Ganesha, Bandung, Indonesia, candra86mecca@gmail.com

Corresponding Author: anggiaputrideniyanti@gmail.com[1]

Abstract: Advancements in information technology have accelerated digital transformation across various sectors, including public services. The Regional House of Representatives (DPRD) of West Java Province holds a strategic role in accommodating and responding to public aspirations and complaints. However, the existing manual complaint management process presents significant challenges, such as inefficiencies in operations, limited transparency, and potential inaccuracies in data handling. To address these issues, this study proposes the design and development of an integrated, web-based public complaint information system. The system is developed using the structured Waterfall model, which includes stages of requirement analysis, system design, implementation, testing, and maintenance. PHP and MySQL serve as the core technologies for development. Results from black-box testing indicate that all system functionalities perform as expected. The system allows users to register, submit complaints, and track their status in real time, while administrators can efficiently manage and respond to complaints through an online interface. This solution is expected to strengthen communication between the public and the DPRD and to foster greater public participation in government accountability and oversight.

Keyword: Information System, Public Complaints, Web, Waterfall, DPRD

INTRODUCTION

The rapid advancement of information technology has transformed many aspects of society, including public services. Without information technology, the current state of information development would not be as sophisticated [1]. Amid growing public demands for more responsive and accountable services, government institutions are required to continuously innovate in providing platforms that bridge public aspirations and complaints. One such effort is the development of a digitally integrated public complaint service system [2]. The expression of aspirations and complaints is a fundamental right of citizens in a democratic society [3]. In the context of governance, public complaints serve as a vital instrument in promoting

transparent, accountable, and responsive public services. With the advancement of information technology, government institutions—including the Regional House of Representatives (DPRD) of West Java—face the challenge of providing effective channels for citizens to voice their concerns.

The DPRD is a regional legislative body with three main functions: legislation, budgeting, and oversight. The DPRD of West Java Province serves as a provincial-level legislative body representing the people in overseeing policies and regional development. According to the DPRD regulations of West Java, the institution is also responsible for receiving and responding to public aspirations through various channels such as recess activities, public hearings, and complaint services [4]. As a representative institution, the DPRD of West Java plays a crucial role in listening to and responding to complaints from the public. However, in practice, the complaint handling process in many government institutions is still manual or not yet fully digitalized. This leads to slow, unstructured complaint processing, potential data overlaps, and limited follow-up actions [5]. As a legislative body with oversight, legislative, and budgetary functions, the DPRD should be at the forefront in capturing and addressing public aspirations, including complaints. Therefore, there is a need for an information system that can facilitate communication between the public and the DPRD in a more systematic, transparent, and efficient manner.

The digital transformation at the DPRD of West Java has brought significant changes to the public service system. Under the old system, services were still manual or semi-digital, relying on physical documents and local applications like Excel. This resulted in limited access, where the public could only obtain information or submit aspirations through direct visits to the DPRD office or by going through lengthy bureaucratic processes. The user interface of the old system was also not user-friendly, making it difficult for both the general public and internal staff to access and manage information [6]. With technological advancements, a new web-based system has been introduced, making service processes faster and more efficient. Automated workflows such as documentation, verification, and reporting reduce manual workloads, speed up response times, and minimize data entry errors. Transparency has also improved, as the public can now access real-time information and DPRD performance reports through a public portal. Additionally, this new system includes digital participation features such as e-aspirations and online complaints [7]. This technology enhances the operational efficiency of the DPRD of West Java and strengthens the relationship between local government and the public by providing more open, fast, and secure services.

Therefore, a “Web-Based Public Complaint Service Information System” has been designed. This system uses the Waterfall model for its development process and adopts a structured design methodology. It is implemented as a web application using Sublime Text with PHP as the programming language and MySQL as the database. The system enables the public to submit aspirations or complaints to the DPRD of West Java Province. It is expected to streamline the documentation, verification, and follow-up processes of public complaints by the DPRD of West Java.

2. Basic Theory

A. Public Information System

According to Law Number 14 of 2008 concerning Public Information Disclosure, every citizen has the right to access information from public bodies, and conversely, public bodies are obliged to provide open and easily accessible information. In this context, a public information system serves as a bridge between the government and the public in promoting information transparency.

B. Web-Based Public Complaint System

Lorensa et al. (2020) developed a web-based public complaint application in Bangkalan Regency. The system is integrated with customer data from the local water utility (PDAM), enabling specific complaint tracking based on users' connection numbers.

C. Public Complaint Services

According to the Ministry of Administrative and Bureaucratic Reform (Kementerian PANRB, 2018), public complaint services represent one form of active community participation in the administration of public services. Through complaints, the public can submit grievances, criticisms, or aspirations directly to government institutions.

D. Web-Based Technology

According to Laudon and Laudon (2016), a web-based system is a system designed to be accessed via the internet using a browser, without requiring additional installations on the user's device.

E. Information System Design and Development

According to Pressman (2010), information system design involves requirement analysis, system design, implementation, testing, and maintenance. The Waterfall model, which emphasizes sequential development stages, is a popular strategy. For projects with well-defined requirements, such as public complaint systems, this model is favored for its clarity and ease of management

METHOD

A. Data Collection Techniques

This study adopts a qualitative approach to gain an in-depth understanding of the design and development process of a web-based public complaint service system at the Regional House of Representatives (DPRD) of West Java Province. This method is chosen for its ability to explore meanings, perceptions, and experiences of stakeholders, both from the perspective of service users (the public) and service providers (DPRD staff).

The data collection techniques used in this study include:

Observation

The researcher conducted direct observations at the DPRD of West Java Province to identify the current complaint handling workflow.

Interviews

Interviews are two-way question-and-answer sessions aimed at gathering qualitative data. In this study, interviews were conducted with Public Relations staff and the Chairperson of Commission I (Administrative and Government Affairs).

B. System Development Method

This study employs the Waterfall Method for developing the web-based public complaint service system at the DPRD of West Java Province. The Waterfall model is selected due to its systematic and structured phases, which are suitable for systems with clearly defined requirements from the outset. The development process consists of five main stages:

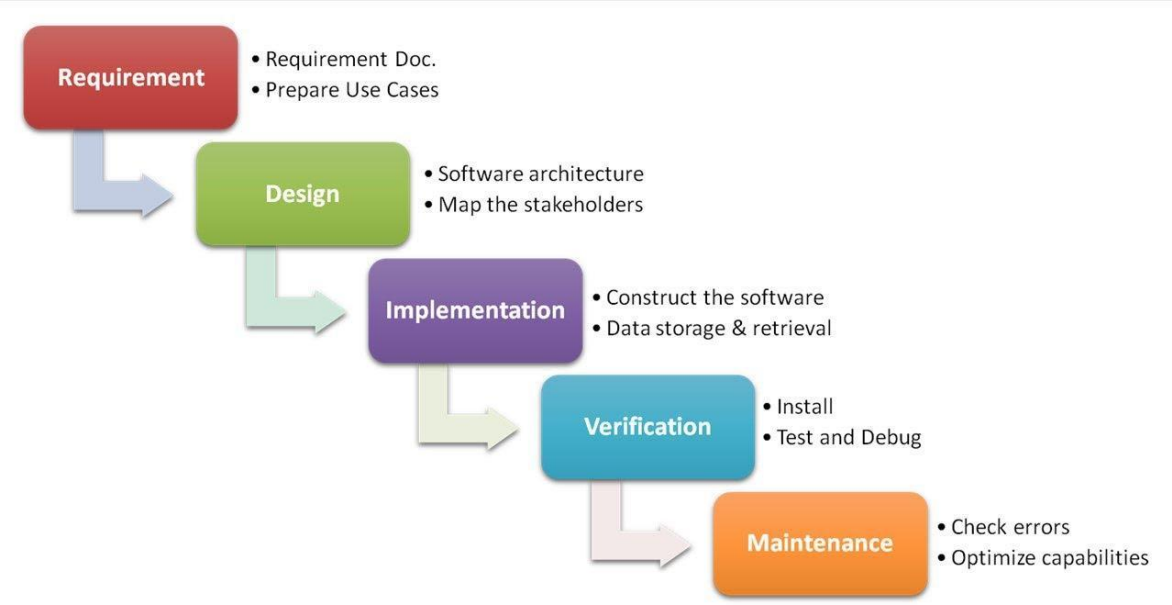

Figure 1. Waterfall Methods

1. Requirement Analysis

The researcher conducted interviews and direct observations of the complaint management process within the DPRD to gather system requirements.

2. System Design

The user interface was designed using a flowmap approach to ensure the system would be user-friendly for both the general public and internal administrators.

3. Implementation

The system was developed as a web-based application using PHP as the programming language and MySQL as the database.

4. Testing

Black-box testing was performed to verify that all system functions operate as expected.

5. Maintenance

System evaluation was carried out by collecting feedback from potential users in order to refine the system prior to full deployment.

RESULTS AND DISCUSSION

A. Requirement Analysis

The analysis results of the web-based public complaint information system are illustrated through the use of Sublime Text as the code editor, PHP as the programming language, and MySQL as the database.

1. The public can submit complaints and view responses provided by administrators. Administrators are assigned based on their respective divisions or areas of responsibility.
2. Administrators are able to manage complaint data.

The developed web-based public complaint application successfully meets the basic needs of the public in submitting reports online to relevant government institutions. Based on the results of implementation and testing, the application consists of several main modules, including registration and login, complaint submission, complaint verification by administrators, and response management by officers. Each module was tested using black-box testing to ensure that all functionalities performed according to user scenarios [8]. The registration module allows users to sign up by entering their name, national identity number

(NIK), email, and password. Upon successful registration, users can access the system through a login process that authenticates their credentials. Testing showed that input validation at this stage functions effectively, such as rejecting duplicate emails or incorrectly formatted NIK.

In the complaint module, users can submit complaints, which are then verified by administrators for approval or rejection based on content feasibility. The response module enables authorized staff to provide solutions or clarifications in response to public complaints. The entire process is logged and displayed in the complaint history module, which users can access to track the status of their reports. Testing results indicate that all workflow processes function as expected, and the application demonstrates good responsiveness across various devices. Therefore, this application can serve as an effective alternative to enhance public participation in monitoring public services through the use of information technology [9].

B. System Design

A flowmap illustrates how data, documents, and activities move through a workflow or business process. In information system analysis, flowmaps are often used to demonstrate how data and documents circulate within an organization or system. A program or system process flowmap is a logical diagram. The primary purposes of a flowmap are for communication and documentation [10].

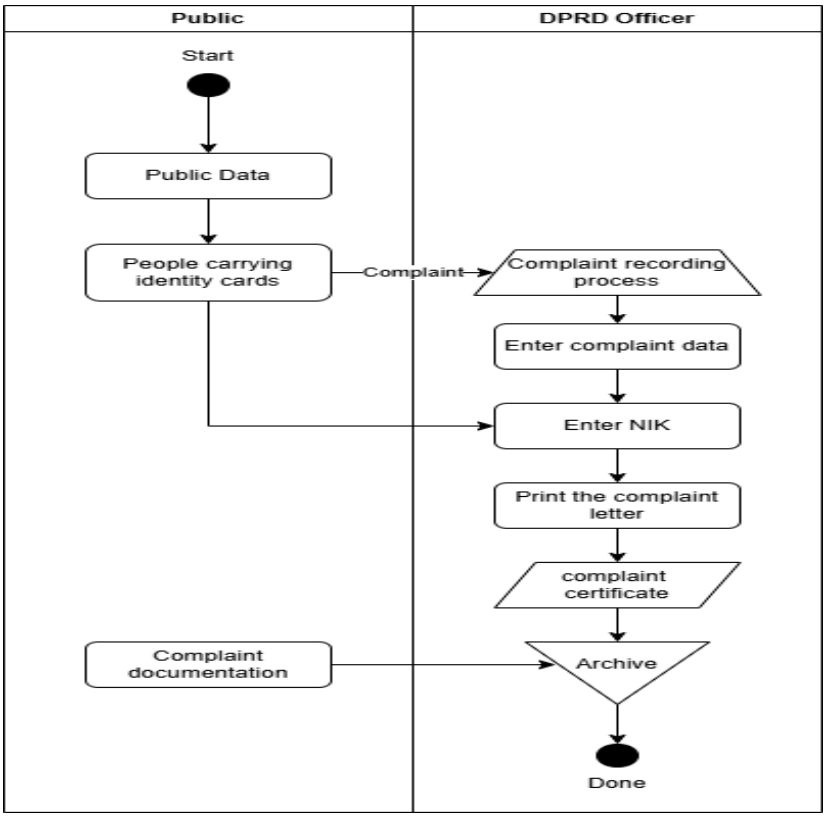

Figure 2. Old System Flowmap

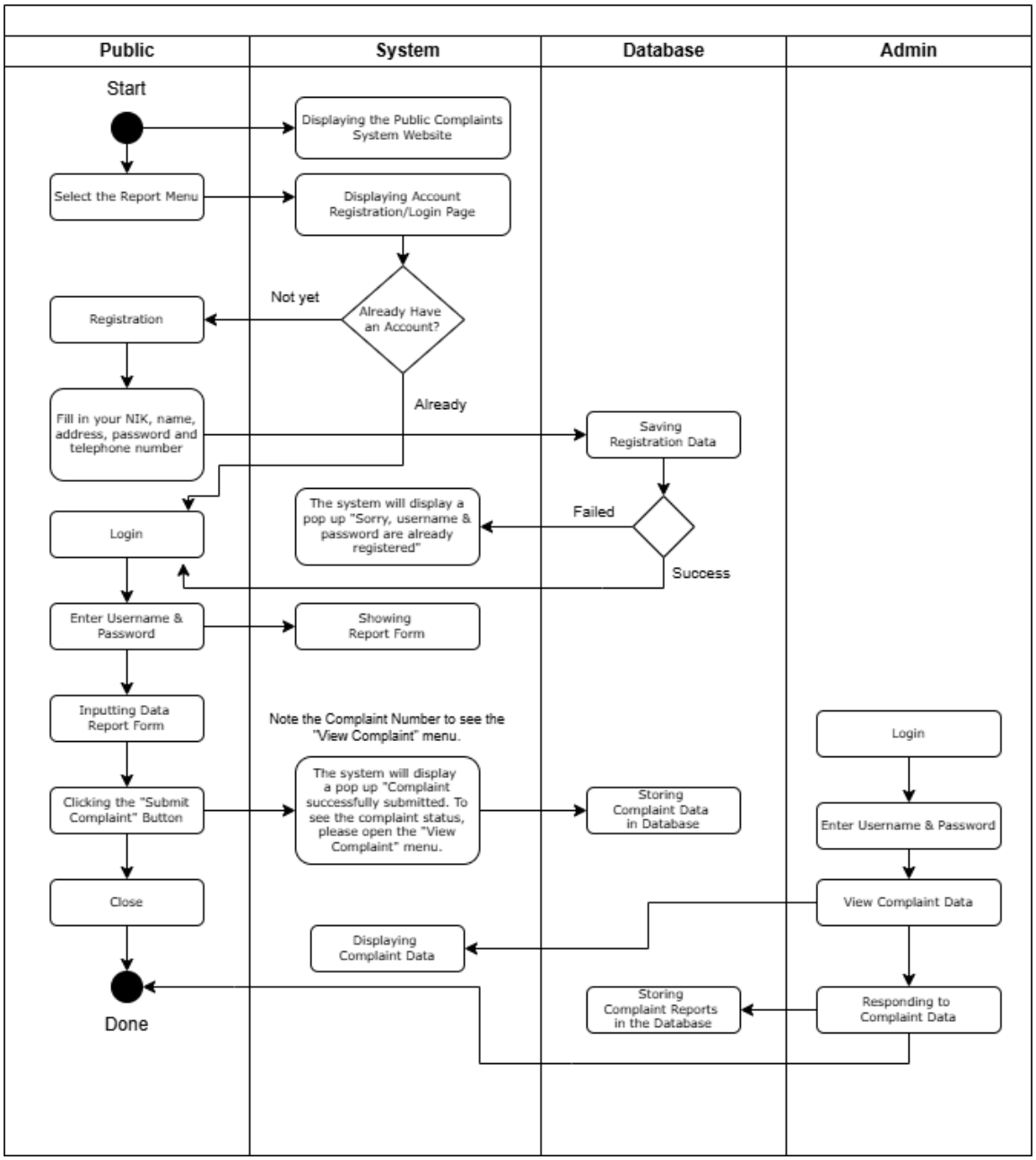

Figure 3. Running System Flowmap

A Data Flow Diagram (DFD) is used to illustrate how the logical model of a system represents data sources, interactions, and outputs [11]. The Context Diagram shows how a system interacts with its external environment. It provides an overview of the entire system without detailing the internal processes.

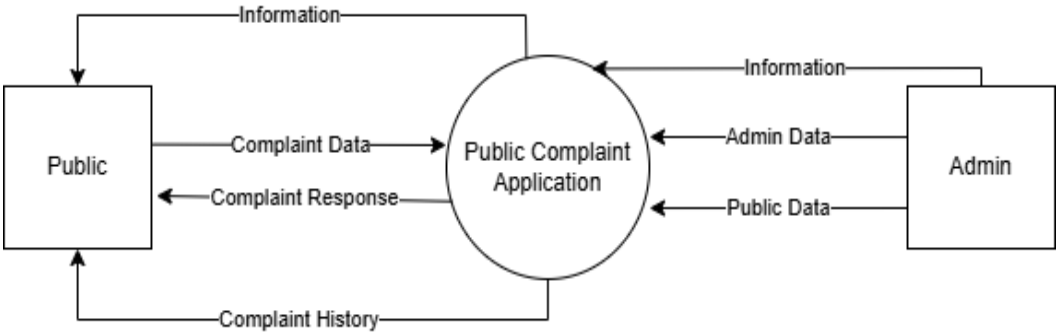

Figure 4. Context Diagram

2) Data Flow Diagram (DFD) Level 0

DFD Level 0 represents the depiction of operations using external data sources [12].

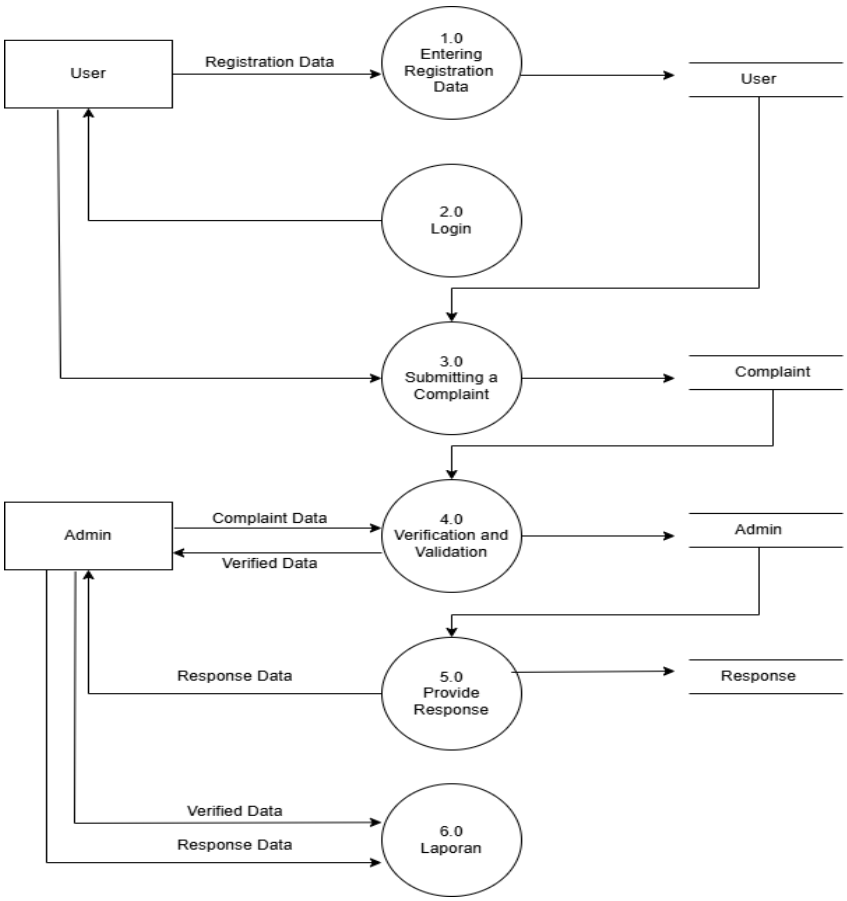

Figure 5. DFD Level 0

3) DFD Level 1

DFD Level 1 is a development or derivative of DFD Level 0 which is used to detail the main processes in the system [13].

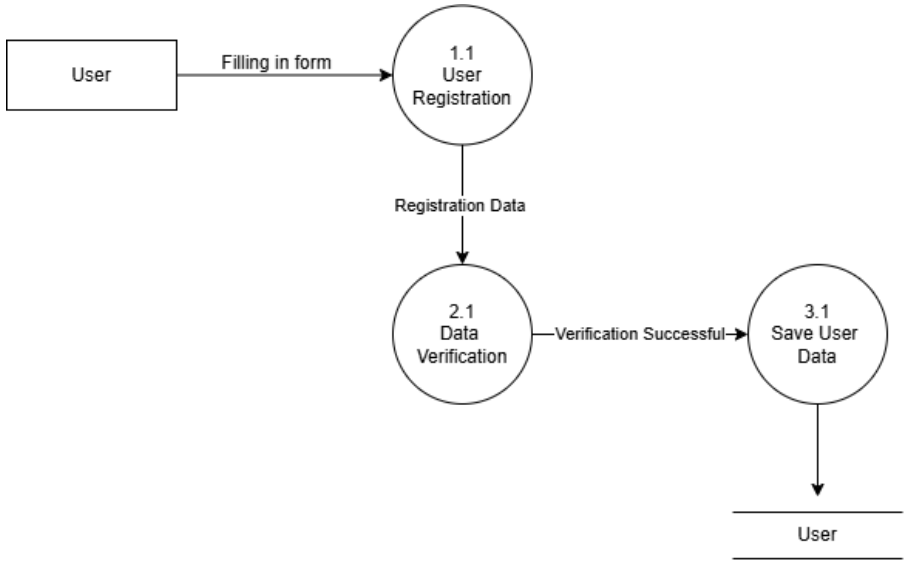

Figure 6. DFD Level 1

ERD is a diagram used to model the logical structure of a database by describing entities, attributes, and relationships between entities in the system. ERD is a primary tool in database design, especially in the relational database approach to describe how data is interconnected [14].

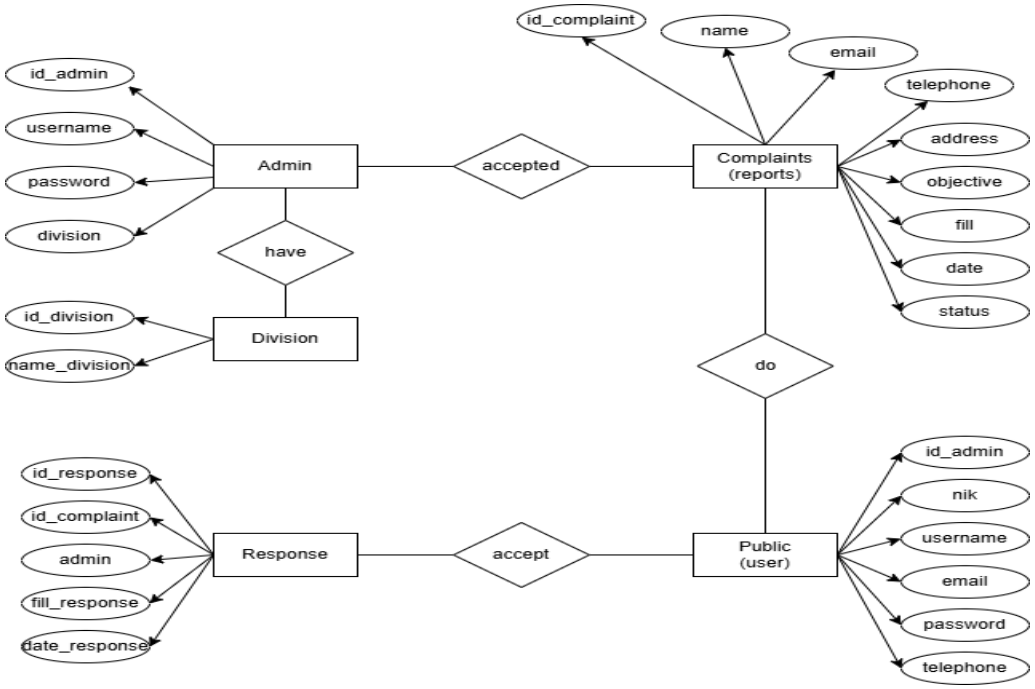

Figure 7. ERD

C. Implementation

1. Registration Page

The registration page displays the process of entering personal data to create an account that is used for the login process.

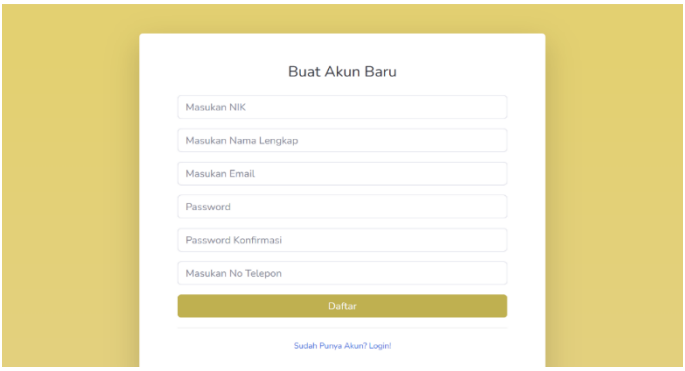

Figure 8. Registration Page View

2. Login Page

The login page displays the login process that will be entered by the user, whether it is an admin or the public

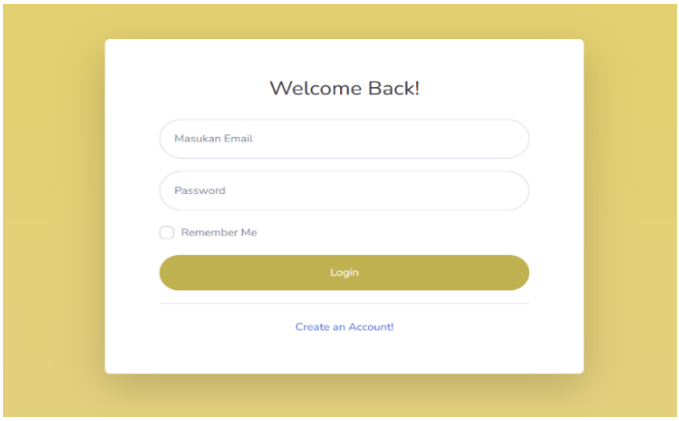

Figure 9. Login Page View

3. Home Page

On the home page, displays the homepage of the website. There is also information about the agency, starting from the service profile, assistance, contacts and report and view complaint features.

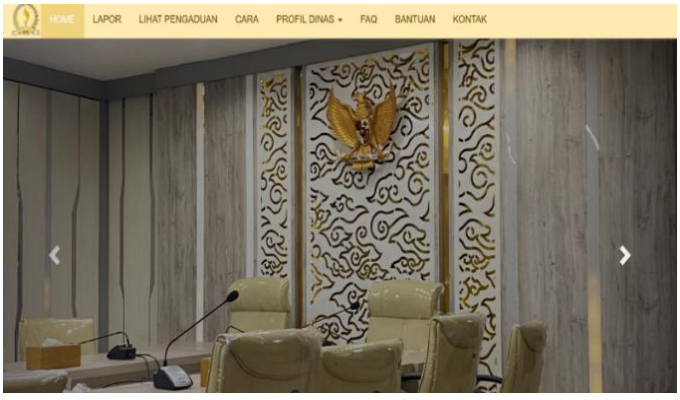

Figure 10. Main Page View

4. Admin Page

On this page, the admin can see all incoming reports from the public and can also provide replies or responses regarding the reports.

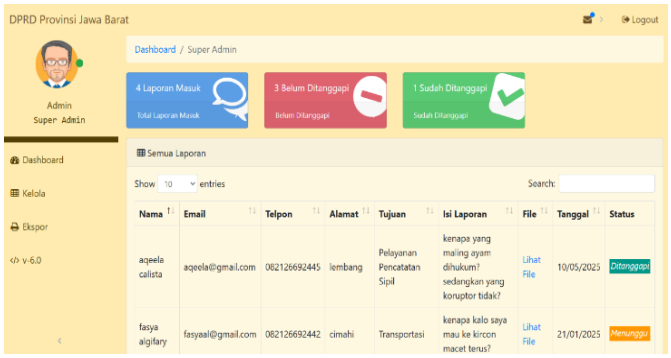

Figure 11. Admin Page View

5. Report/Complaint Page

This page is used by the public to report complaints to the West Java Provincial DPRD.

Figure 12. Complaint Page View

Software design is realized in the form of a series of programs. In order to be recognized and run by a computer, the design must be coded in a programming language. PHP and Mysql are used to build this system. [15].

A. Testing

Software testing is software testing to ensure that the software meets user requests, runs according to specifications, and is bug-free. Testing is done to detect software bugs and ensure system quality before widespread implementation.

Table 1. Blackbox Testing

No.	Test Scenario	Expected results	Test results	Status
1.	Register with complete and valid data	The system stores registration data in the database.	Registration successful, user is directed to the login page	Succeed
2.	Registration without filling in NIK	The system can perform registration	An error message appears "please fill out this field", namely the NIK field that was previously left blank.	Succeed
3.	Login with valid email and password	The system displays the login page.	Successfully logged in and entered the user dashboard	Succeed
4.	Login with wrong email or password	The system denies login access rights	The system will deny login access and display a notification	Succeed

			“incorrect username or password.”	
5.	Submit a complaint with all data filled in completely	The system sends complaints and stores complaint data in the database.	Complaint successfully submitted and saved in database	Succeed
6.	Admin responds to complaints	The system creates a response and appears on the user page.	The system successfully displays responses according to the complaints received.	Succeed
7.	The user fills in the complaint number correctly in the "View Complaint" menu	The system will display the admin's response on the "View Complaint" page.	Users can see the status of “View Complaint” whether it has been responded to or not. If so, there is a comment and the status is “responded to” if not, there is no response and the status is “not responded to”	Succeed
8.	The user filled in the complaint number incorrectly in the “View Complaint” menu.	System failed to login for “View Complaint” menu	The system successfully displays the message "Failed, complaint number not found"	Succeed
9.	Admin manages complaint data	The system provides a display of complaint data stored in the database.	The system successfully displays the number of public complaints along with the response status.	Succeed
10.	Export complaint data	The system can export complaint data in PDF or Excel format.	The system successfully exported the complaint data stored in the database.	Succeed

Questionnaire

This questionnaire consists of several questions that are distributed directly to respondents. The collected data is then processed and displayed in graphical form. This method is used to collect information to support the research results, especially to assess whether the web-based public complaint application in the West Java Provincial DPRD can be a more effective and efficient solution in conveying aspirations and complaints.

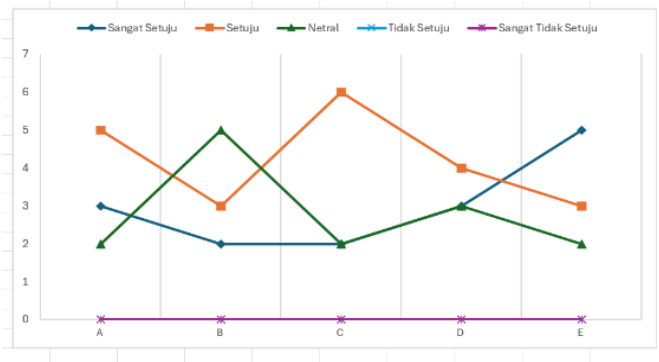

Figure 13. Questionnaire Results

Statement:

A. The public complaint application (website) is quite easy to use even for the first time accessing it
B. This application (website) is an effective means of helping the public convey their aspirations and complaints directly
C. This application (website) facilitates two-way communication between the public and the DPRD directly and efficiently
D. This application (website) has a clear interface and makes it easy to understand the flow of submitting complaints
E. This application (website) has a smooth registration and login process and does not make it difficult for users

Based on Figure 12 above, there were 50 respondents who responded to the application (website) that had been designed. The majority of respondents were in the "Agree" category (42%), followed by "Strongly Agree" (30%) and "Neutral" (28%). No respondents stated "Disagree" or "Strongly Disagree", indicating that the response to the questions or services in this survey tended to be positive.

E. Maintenance

The maintenance phase is carried out after the system has been successfully tested and confirmed to function properly. During this phase, the system is continuously monitored and evaluated to ensure its performance remains optimal. If any bugs that were missed during testing are discovered, they are promptly fixed. Maintenance also includes adjustments to meet new requirements, as well as the addition or improvement of features based on user feedback and technological developments.

CONCLUSION

Based on the analysis, design, implementation, and testing processes that have been carried out, it can be concluded that a web-based public complaint system is indeed needed to overcome the problem of manual services that have been slow, inefficient and non-transparent in the West Java Provincial DPRD. This system was developed using the waterfall method using PHP and MySQL, so that complaint management becomes more structured. The public can register, log in, send complaints and monitor the status and responses from the DPRD easily. On the other hand, admins who are divided by division can verify and respond to complaints digitally. The results of the black-box test show that the features run as expected. Overall, this system is able to increase transparency, accelerate services, and encourage public participation, making it worthy of being used as a digital solution in supporting public services and supervision by the Regional House of Representatives (DPRD)

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