



Design of a Web-Based Congregation Complaint Information System (Case Study of GKS Andumanang)

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Abstract

The rapid development of information technology has had a significant impact on the effectiveness and efficiency of services in various fields, including church services. The Sumba Christian Church (GKS) Andumanang is a local church active in spiritual and social services to its congregation. However, the congregation's complaints system, which is still carried out manually, such as through in-person meetings or by telephone, causes various obstacles in submitting, recording, and handling complaints. Congregants who live far from the church and the busy schedules of each party are the main obstacles in the two-way communication process between the congregation and the church. To address these problems, this study aims to design and develop a web-based congregational complaints information system that allows the complaints process to be carried out effectively, efficiently, and well-documented. This system was built using the Waterfall method, which includes the stages of needs analysis, system design, implementation, and testing. With the implementation of this system, it is hoped that it will improve the quality of church services, strengthen transparency and accountability, and accelerate the response to congregational complaints.

Keywords: Information System, Congregation Complaints, GKS Andumanang, Web, Waterfall

1. Introduction

The Sumba Christian Church (GKS) Andumanang is a local church active in spiritual and social services to its congregation. One important form of service it provides is receiving and handling complaints from its congregation. These complaints cover various aspects of church life, such as wedding blessings, religious services, baptisms, Sunday school, and other worship activities. Receiving complaints from the congregation serves as a means of two-way communication between church leaders and the congregation. Through this mechanism, the church can listen to and understand the various problems, questions, and concerns raised by the congregation. This not only enables the church to respond appropriately to the congregation's needs and concerns but also improves the quality of service, transparency, and accountability in church management. Therefore, the complaint-receiving process is not merely administrative but also a manifestation of the church's pastoral responsibility in meeting the spiritual and practical needs of its congregation.

GKS Andumanang is led by Rev. Mora Henggi, S.Th. This church was chosen as the research location because the current complaints system is still manual, namely through face-to-face meetings or telephone communication. This method has several limitations, such as difficulties for congregants who live far from the church to submit complaints, as well as time constraints due to busy congregations and the church's busy schedule. As a result, not all complaints can be conveyed properly, on time, and systematically documented. This has an impact on the church's less than optimal response in handling congregation aspirations, suggestions, and complaints.

To address the above issues, a web-based congregational complaint information system is needed for the Andumanang congregation. This system can enable the Andumanang congregation (GKS) to submit complaints effectively. This system was developed using the waterfall method approach. This method explains the approach in software development starting with system design and user needs, which includes system planning stages such as system analysis, system design, system implementation, and system testing, which are part of software development. The implementation of a web-based congregational complaint information system at the Andumanang GKS can provide assistance to the Church and the Congregation in managing and handling complaints.

2. Literary Studies

2.1. Technological Developments

The rapid development of technology and information has had a significant impact on organizations, institutions, and individuals. Websites, as a medium for conveying information, provide a solution for those with limited time and access to information. In the church context, managing congregational complaints is crucial [1].

2.2. Complaints

A complaint is an expression of dissatisfaction with the service received from a service system. Public complaints refer to information or notifications submitted by individuals or community groups regarding the behavior or performance of government officials related to a community event. The purpose of complaints in this web-based information system is to resolve common problems that occur in the community [2].

2.3. system

The system comes from the Greek, namely "Systema" or the same as unity. Viewed from the point of view of the word system is a collection of objects that work together to produce a unity of methods, procedures, techniques that are combined and arranged in such a way that they become a unit that functions to achieve a goal [2] The system is defined as "A system is a network of interconnected procedures, gathered together to carry out an activity or to complete a certain target [3].

A system is a collection of various elements that work together and interact to achieve a specific, predetermined goal. Broadly speaking, a system is anything that works together and interacts with other components, depicting a real-world event. A system typically contains a series of structures or processes running within it. This series of processes will continue to run until the desired goal is achieved [4]. This term has a meaning related to the organization and arrangement of different elements into an integrated whole.

2.4. Information

Information is a result of data processing to become something meaningful, information is presented in a way that provides meaning or added value for the recipient. Information can be used to improve understanding, make decisions, or take action [5]. Information can be defined as the result of data processing in a form that is more useful and more meaningful for the recipient which describes real events that are used for decision making [6] Based on the definition of information above, the author concludes that information is the result of processing data from several sources that have been processed so that it becomes useful information for the surrounding environment

2.5 .Informstion System

A system is a collection of components or elements that interact and work together to achieve a specific, complementary goal. In general, the characteristics of a system are: having a purpose, having boundaries, being open, consisting of subsystems, and interrelated and interdependent elements, forming a systematic whole.

An information system is a series of information consisting of interrelated and interdependent parts, from large to smaller. In other words, an information system is a collection of interconnected elements that form a single unit to integrate, store, process, and distribute information

2.6. Website

A website is a means of displaying information online which can be in the form of images, videos, text and sound and is interactive by connecting one document to another via hyperlinks which can be accessed via a browser.

2.7. Waterfall Method

Waterfall is a model that was initially used and is very common in the project creation process in large agencies and industries. Waterfall prioritizes documentation and this model is suitable for projects that prioritize quality and states that Waterfall describes the development of a model that presents the process of software life rules with an influential system that can be said to be sequential by prioritizing the analysis, design, coding, testing and supporting parts. According to [7] it states that waterfall has several.

2.8. Perl Hypertext Preprocessor (PHP)

PHP, short for Hypertext Preprocessor, is an open-source programming language well-suited for web development and can be embedded in HTML scripts. PHP can be said to mimic several programming languages, such as C, Java, and Perl, and is easy to learn [8]. PHP stands for PHP Hypertext Preprocessor, which is a server-side programming language. PHP's primary function in website development is to process data in a database.

Website data is entered into the database and edited. PHP is a server-side scripting language that integrates with HTML to create dynamic web pages. PHP: Hypertext Preprocessor, commonly referred to as PHP, is a widely used programming language for website creation and development and can be used in conjunction with HTML [9].

2.9. My Structured Query Language (MySQL)

MySQL is a database management system that uses a relational database management system (RDBMS) model, similar to SQL Server. As an open-source system, MySQL can be freely used and developed as needed [10]. MySQL is a primary choice for developing websites and web-based applications because it can process millions of requests and thousands of transactions simultaneously.

2.10 UML (Unified Modelling Language)

UML (Unified Modeling Language) is a standard visual language widely used in industry to define requirements, perform design analysis, and describe architecture in object-oriented programming.

UML (Unified Modeling Language) is a standard language widely used in industry to define requirements, conduct analysis and design, and describe architecture in object-oriented programming. UML contains several types of diagrams that can illustrate a system. Here are some of the diagrams contained within [11]

2.11. Black Box Testing

The Black Box method is a test that aims to detect errors in application systems, such as functional errors and missing application menus. This method focuses on testing the application system's functionality. Testing is conducted using random input data to obtain clear results. A clear result means the input data is incorrect, so the system will reject it or the data will not be stored in the database. Conversely, if the input data is correct, the system will process it and store it in the information system database

Black box testing is a functionality-oriented test, namely the software's behavior in response to user input to achieve/produce the desired output without observing the internal processes or program code executed by the software.[12]

3. RESEARCH METHODS

3.1. Research Subjects

The congregation is the primary user of this complaint information system. They serve as the parties who submit complaints, suggestions, or reports of problems occurring within the church environment, such as damaged facilities, inconvenience during services, or unmet spiritual needs. The congregation is the one who directly experiences the services and activities of the church. Therefore, it is important to provide an easy and effective channel for them to submit input or complaints so that church management can be aware of and promptly act on them.

3.2. Research Object

The current research object at the Sumba Christian Church (GKS) Andumanang is currently led by Rev. Mora Henggi, S.Th. GKS Andumanang has 10 members, and the Andumanang congregation has 310 eligible members (161 men and 149 women).

3.3. Research Flow

The research flow is the steps to be taken in conducting the research. The predetermined flow will serve as a guideline and serve as a guide so that the research does not deviate from the predetermined path. The research flow begins as shown in the image below: Section headings

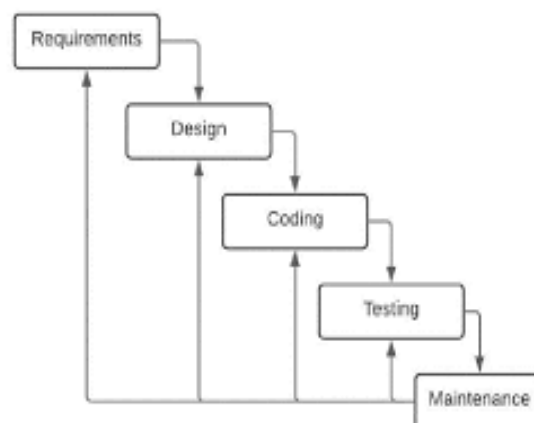


Fig. 1: Research flow

3.4. Legacy System Workflow

The system analysis discusses the work processes of the old system and the work processes of the new system in congregation complaints.

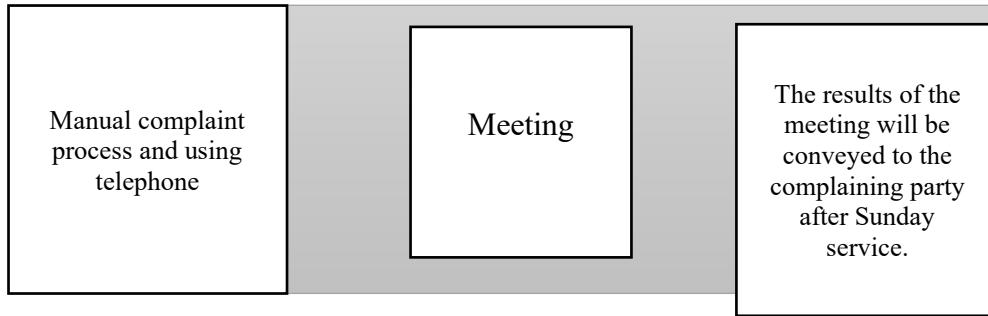


Fig. 2: Legacy System Workflow

The image above explains that in the congregational complaints system currently running at GKS Andumanang, the complaint submission process is still carried out manually. Congregants who have complaints, suggestions, or input regarding church services must submit them directly to the church council or administrators, either in person after the service or by telephone if physical attendance is not possible. Complaints received are recorded informally, often without written documentation. The complaints are then discussed in a scheduled council meeting to formulate follow-up actions or solutions. The results of the discussion are then communicated to the congregation concerned verbally or by telephone. This manual process creates various obstacles, such as delayed complaints, inadequate documentation, and not all congregants being able to convey their aspirations optimally.

3.5. Workflow of the System Offered

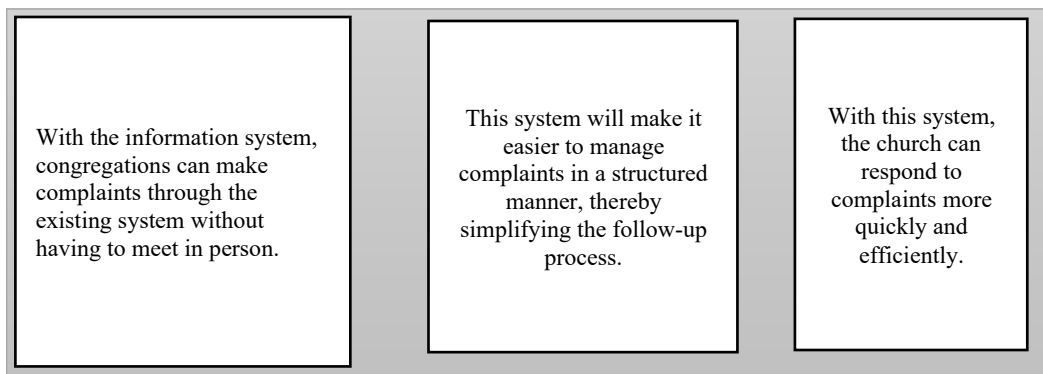


Fig. 3: Legacy System Workflow

The image above illustrates the flow of the congregation's complaints process. With the information system, congregations can submit complaints through the available platform without having to meet in person. Analysis of the newly developed system shows increased speed and efficiency in the complaints process. Congregants can submit complaints online via the web, thus eliminating time and location constraints. All complaints are directly entered into the system, recorded automatically, and their handling status can be monitored by the congregation and administrators. This makes services more structured, responsive, and simplifies evaluation because data is fully recorded in the system.

4. RESULTS AND DISCUSSION

4.1. System Implementation

System implementation is the stage of applying the developed software design into a ready-to-use application. This process includes installation, configuration, and system testing on a localhost environment. The goal of implementation is to ensure all functions run according to user needs and can be operated to support congregational services at the GKS Andumanang Church. The application developed has two types of dashboards: the Congregation Dashboard as the user interface and the Admin Dashboard as the data and information management center. Each dashboard is equipped with features appropriate to its respective role.

4.1.1. Login Page

The login page serves to authenticate congregants and administrators. The login process verifies the username and password against the database. If the data is valid, congregants are directed to the Congregation Dashboard, while administrators are directed to the Admin Dashboard. If the data is invalid, the system displays an error message. The login page display can be seen in Figure 4.

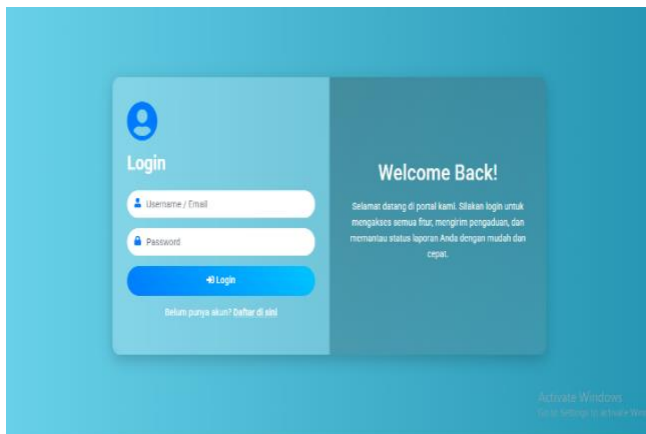


Fig. 4: Login Page

4.1.2. Congregation Registration Page

The registration page allows congregants to create an account by entering their personal data (full name, email address, username, password, gender, and congregation name). The entered data is stored in the users table in the database. The registration process only applies to new congregants; existing congregants can log in directly. The registration page can be seen in Figure 5.

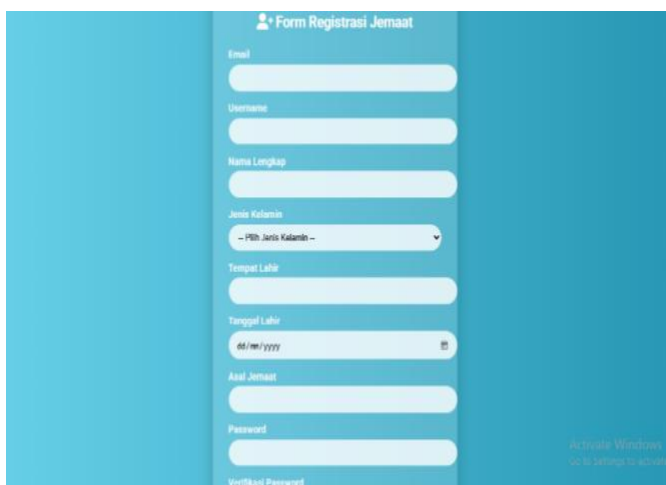


Fig. 5: Registration page

4.1.3. Congregation Dashboard

The congregation dashboard is the main page accessible after successfully logging in. On this page, congregants can view navigation menus such as Home, About Us, Congregation Complaints, and the Logout feature. This dashboard serves as a central hub for congregation activities, allowing them to convey aspirations or complaints, such as missing services, church facilities, marriage complaints, baptism complaints, and other matters. The congregation dashboard page can be seen in Figure 6.



Fig. 6: Congregation Dashboard

4.1.4. About Us

The About Us page provides an overview of the Sumba Christian Church (GKS) Andumanang Congregation. The information displayed includes a brief history of the church's founding, its vision, and its mission, which serves as a guide for all ministry activities. This information can be seen in Figure 7.

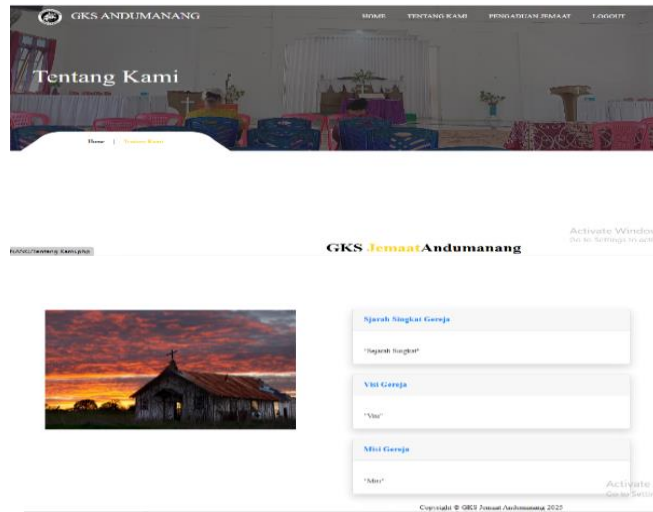


Fig. 7: About Us

4.1.5. Congregation Complaints Page

The Congregation Complaint Form is provided as an official medium for congregations to submit problems, criticisms, suggestions, and reports. Data entered includes name, email address, complaint category, type of problem, content of complaint, and supporting documents (optional). All reports received are stored in the database and can be followed up by the administrator. This feature ensures transparent communication between the congregation and church administrators. The Congregation Complaint page can be seen in Figure 8.

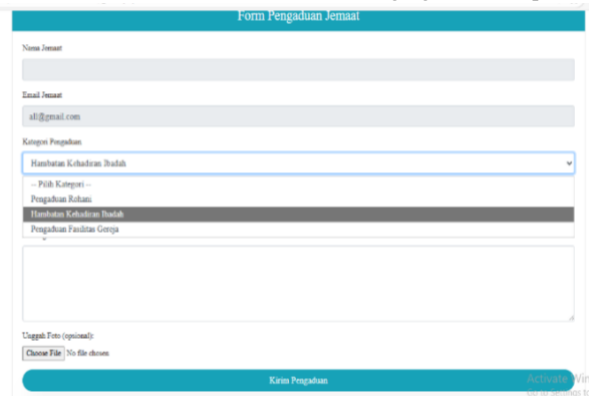


Fig. 8: Complaints Page

4.1.6. Admin Dashboard Page

The Admin Dashboard is the main control center used by church management to monitor and follow up on congregation complaints. This page displays a navigation menu consisting of a Congregation Data Table, Admin Complaints, and Congregation Complaints, which functions to manage congregation information and incoming complaint reports. The interface is designed simply with an informative display to make it easy for admins to access data. Through this dashboard, admins can view the latest complaints, provide responses, update complaint statuses, and compile reports. Thus, the admin dashboard plays a vital role in supporting the effectiveness, transparency, and accountability of church services to the congregation. The admin page can be seen in Figure 9.



Fig. 9: Admin Dashboard Page

4.1.7. Congregation Registration Data Table

The Congregation Data Table is a feature used by admins to manage information about congregants registered in the system. The data displayed includes full name, gender, place of birth, date of birth, and address. Additionally, there are Edit and Delete action menus that allow admins to update or delete congregant data as needed. The system also provides a Manual Add Data button so admins can enter new data directly. This table makes congregant data management more structured and easily accessible. For more clarity, see Figure 10.

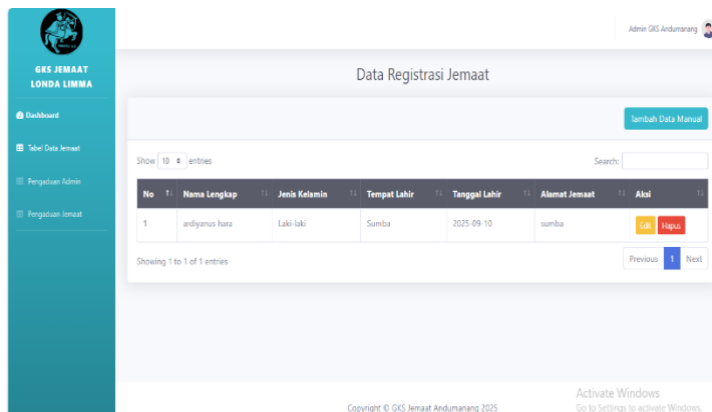


Fig. 10: Congregation Registration Data Table

4.1.8. Admin Complaint

Admin Complaints is a feature used by church management to convey information, announcements, and general instructions that the congregation needs to know. This page displays data in the form of the complaint title, description, supporting documents (if any), and the announcement date. Admins are also provided with Add Complaint, Edit, and Delete menus to simplify information management. This feature makes delivering information to the congregation faster, more transparent, and neatly documented in the system. The Admin page can be seen in Figure 11.

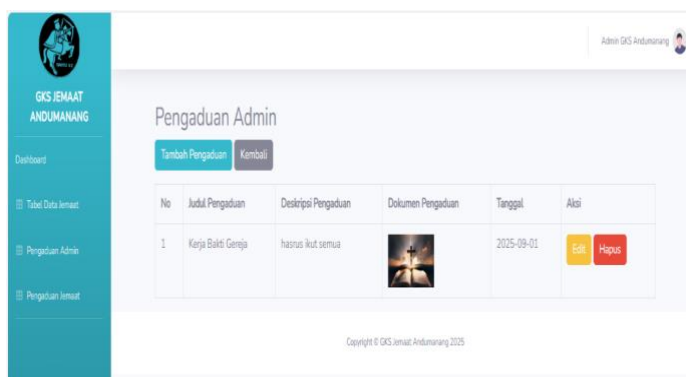


Fig. 11: Admin Complaint

4.1.9. Congregation Complaints Data

The Congregation Complaints feature on the admin dashboard displays all reports submitted by the congregation. Information presented includes the reporter's identity (name and email), category, subcategory, complaint content, admin response, supporting documents, and the date of the complaint. Admins have full control over whether to respond to or delete data. This feature makes communication between the congregation and the church more interactive, responsive, and well-documented, thus supporting improved service quality.



Fig. 12: Congregation Complaints Data

4.2. System Testing

System testing is the stage carried out to ensure that the application runs according to its designed functional requirements. The testing process is conducted on a local host using the XAMPP server, with the aim of verifying each feature for optimal usability before being implemented in real-world situations. The testing method used is functional testing, where each menu is tested based on the input provided and the resulting output. This approach determines whether the system meets the expected specifications.

4.3. Testing Objectives

The purpose of this system testing is to ensure that the software developed can run according to the needs and specifications established during the design stage. Through testing, it can be verified whether each main function, such as login, congregation data management, complaint submission, and admin response, is operating as intended. Furthermore, testing is conducted to assess the accuracy of the data storage and processing process in the database, so that the information displayed to users is valid and consistent. Testing also aims to assess the level of system reliability in supporting communication between the congregation and the church, as well as ensuring the application interface is easy to use (user-friendly). Thus, testing is not only intended to find errors or deficiencies, but also to provide assurance that this congregation complaint information system is suitable for use in supporting church services effectively, efficiently, and transparently.

4.4. Testing Scenario

Test scenarios were developed to test all functionality within the congregational complaint information system, from both the congregation as primary users and the administrator as system manager. Each scenario describes the test cases performed, the inputs provided, and the expected outputs. This ensures that the system operates as designed. Testing was conducted using a black-box testing approach, focusing on the consistency between input and output without considering internal program code. The following are the details of the test scenarios:

Table 1: Testing Scenario

No	Tested Features	Test Scenarios	Testing Steps	Expected Results	Status
1	Congregation Login	Congregation authentication test with valid and invalid data	(a) Enter the correct username & password. (b) Enter the wrong username or password.	a) The system directs you to the Congregation Dashboard. (b) The system displays an error message.	Succeed
2	Admin Login	Admin authentication test	Enter a valid admin username & password.	Admin is directed to the Admin Dashboard.	Succeed
3	Congregation Dashboard	Test main page access after login	Click the "Dashboard" menu on the congregation account.	The page displays church information (brief history, vision, mission) and a complaints menu.	Succeed
4	Congregation Registration	Complete data	All fields are filled in	Data stored in the database	Succeed
5	Congregation Complaint Form	Test complaint submission	Fill in the complaint form (name, email, category, obstacle, complaint content, optional documents) then click submit.	Data is stored in the database and appears on the Admin Dashboard.	Succeed
6	Admin Dashboard	Test admin main menu access	Click the Dashboard menu on the admin account.	The page displays the Congregation Data, Admin Complaints, and Congregation Complaints menus.	Succeed
7	Congregation Data Table	Test congregational data management	(a) Add new congregation data. (b) Edit congregation data. (c) Delete congregation data.	a) New data is saved. (b) Old data is updated.	Succeed

8	Admin Complaint	Test general information management	(a) Add new information. (b) Edit information. (c) . Delete information.	(c) Data is deleted from the database. New information is stored, can be updated, and deleted according to the action.	Succeed
9	Congregation Complaints (Admin version)	Follow-up test of congregation complaints	(a) Display a list of congregation complaints. (b) Add a reply. (c) Delete a complaint.	(a) Data is displayed according to the congregation's input. (b) Replies are saved and visible in the congregation's account. (c) Data is deleted from the system.	Succeed
10	Logout	Test exit from the system	Click the logout button on the congregation/admin.	The system ends the session and returns to the login page.	Succeed

5. Conclusion

This research has produced a web-based congregational complaints information system designed using the Waterfall software development methodology. The system was built to address the congregation's needs in conveying aspirations, criticisms, and complaints, and to support the church in managing these reports more effectively.

Implementation results demonstrate that the system can be run effectively within a localhost environment. Congregants can register, authenticate, and access a dashboard containing general church information and a complaint form. Complaint data submitted by congregants can be received directly by the administrator through the management dashboard. This demonstrates a more systematic and documented communication flow between the congregation and the church.

Furthermore, testing using a black-box testing approach demonstrated that all core features functioned as designed. Congregants could access church information, file complaints, and view follow-up status. Admins had full capabilities in managing congregation data, adding announcements, and responding to congregation complaints. The success of all test scenarios demonstrated the system's suitability as a digital tool to support church services.

Thus, this study confirms that implementing a web-based congregational complaint information system can improve communication effectiveness, data management efficiency, and service transparency within the GKS Andumanang community. Although testing was conducted on a local host, the system has proven to function well and is ready for further development toward implementation on an online server.

Suggestions

The system needs to be implemented on a hosting server so that it can be accessed online by the entire congregation. This step ensures that the system is not limited to local trials but can also be utilized in real-life services. Data security also requires serious attention. The use of password encryption, stricter input validation, and protection against cyberattacks such as SQL injection are crucial to ensure the confidentiality of congregation data.

Further development could include an automatic notification feature, either via email or instant messaging, so that congregations receive notifications when complaints have been responded to or when the report status changes. This feature will increase interactivity and congregation satisfaction in using the system. Furthermore, the system could be equipped with a multimedia attachment facility, allowing congregations to include evidence in the form of photos or relevant supporting documents. This will assist administrators in verifying complaints more accurately.

Accessibility also needs to be improved through mobile-friendly design or even the development of Android/iOS-based applications. This way, congregations can access the system more flexibly as technology evolves. Finally, churches need to conduct regular system evaluations, involving users—both congregation members and administrators—as a source of feedback. These evaluations are crucial for maintaining relevance, addressing deficiencies, and ensuring the system remains aligned with the dynamic needs of church ministry.

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