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Design and Development of Customer Complaint Service Application of PDAM Tirtanadi Branch Medan Denai Based on Android

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ABSTRACT

Objective: *This study aims to design an Android-based customer complaint service application for PDAM Tirtanadi Medan Denai Branch, enhancing customer service efficiency and responsiveness to complaints.* ***Methods:*** *A descriptive qualitative approach was employed, gathering data through direct observation, interviews with customers and administrators, and a literature review. The system development process followed stages including system requirements analysis, design, code generation, testing using black-box methods, and support for maintenance.* ***Results:*** *The resulting application enables rapid, accessible complaint submission for users, providing an effective alternative to traditional call center services and significantly reducing response times for issues such as water quality and meter failures.* ***Novelty:*** *This research contributes an innovative approach for water utility companies in Indonesia by incorporating mobile technology to facilitate 24-hour, location-independent access to complaint services, enhancing service transparency and community satisfaction.*

INTRODUCTION

The development of information technology and telecommunications has brought very significant changes to various lines of human life, one of which is related to public service providers. In the past, interaction between government agencies and the community was often limited by time and location. Especially related to the public complaint section, data governance, and information rapidly and optimally are vital things that are needed for all government institutions that serve the community.

The Tirtnadi Regional Drinking Water Company (PDAM) Medan Denai Branch is a branch of the Regional Drinking Water Company of PDAM Tirtanadi North Sumatra which was established in 2022. Every year, of course, the customers of PDAM Tirtanadi Medan Denai branch continue to increase through various types of households. PDAM Tirtanadi Medan Denai Branch as a water provider in the Medan Denai area with a large total of customers certainly creates various problems that take place every day. Consumer disruptions take place every day such as dead water, turbid water, dead meters, leaking pipes and other disturbances. Disturbances that take place and are reported by customers or the public who recognize a disturbance by visiting the PDAM tirtanadi Medan Denai branch office directly will be recorded the disturbances that have been reported by consumers, and a repair order (SPT) will be issued and submitted to the engineering department to carry out repair design. In addition, in addition to coming to the office

directly to report, it can also be done by calling the office. However, human resources have core shortcomings related to memory and unrecorded disturbances by officers.

Regarding the main needs of PDAM Tirtanadi Medan to improve service to customers and make it easier for consumers to complain, and an android-based complaint service information system is needed that is able to send customer complaint data to a server with an adequate device, namely Android mobile. With the application, it is hoped that the consumer complaint data governance mechanism will be able to take place rapidly in harmony with its own job description. A customer complaint service information system that can create convenience for PDAM staff in receiving complaints from PDAM customers and the public.

RESEARCH METHOD

Data Collection Techniques

1. Observation
   The author carried out direct observation of the activities that took place at PDAM Tirtanadi Medan Denai Branch, especially in the information system service section.
2. Interview
   Carrying out Q&A for other parties such as admins and customers of PDAM Tirtanadi Medan Denai Branch
3. study book
   Data collection through literature, journals, papers, and readings related to the research title.

System Development Methods

1. System Requirements Analysis
   At this stage, an analysis of the needs of the software is carried out by determining the need for information needed to create various reports displayed in the system, namely starting to make complaint reports, and the results of complaint reports.
2. Design
   At this stage, the design and design of the system architecture focuses on the design of data structures, software architecture, interface displays and program algorithms. The system design is divided into various parts, namely: DFD, Database, User Inteface.
3. Code Generation
   This stage is made with commands that are easy to understand and to carry out this programming requires devices such as HTML, PHP, MySQL, java, css, tailwincss and code editor, etc. According to the programming needs. Testing in this stage, the author needs a blackbox as a trial stage. It is intended to validate whether the program is completely free from errors, whether it is writing or logic.

4. Testing
   At this stage, the author uses a blackbox as a trial stage. Which is intended to check if the program is free of writing and logic errors.
5. Support
   This stage is carried out to maintain application programming which is designed in accordance with the needs of the program so that it is maintained like data validation, data updating, and maintaining the program from viruses.

Running system

Use Case Diagram

In the image below there is a use case diagram of a customer complaint application that visualizes the user's activities when using the community complaint application. In figure 3.2, there are 2 people as actors who act as users, admins for customer complaint applications. The user as an actor is able to access all features in the application, in other words, every use case that is connected to the user is able to be accessed by the user.

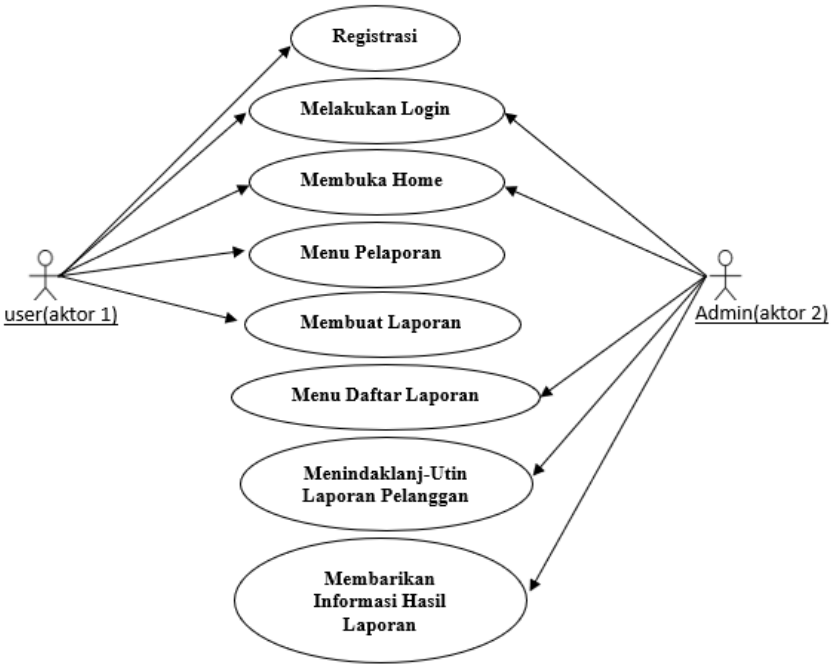

Figure 1 Use Case Diagram

.

RESULTS AND DISCUSSION

App Splash Screen Page

This splash screen will display the logo and company name of PDAM Tirtanadi for 3 seconds.

Figure 2 Application Splash Screen Page

Login Import Page

The user login input below is a design of the user login display, where the user (admin) will enter the email and password that has been registered. Meanwhile, users (customers) will enter their email and password if they have registered as a new user.

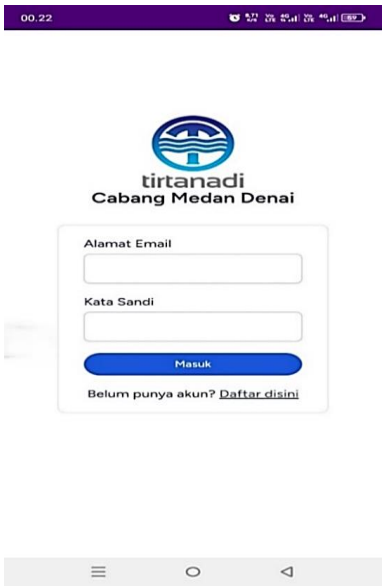

Figure 3 Login Input Page

New User Registration Page

In the image below is a registration page for new users, on this page you will be asked to fill in the form that has been provided such as filling in your full name, address, cellphone number, email address, password (minimum 8 numbers or letters), and repeat the password. After filling in correctly, new users can register and log in to the application.

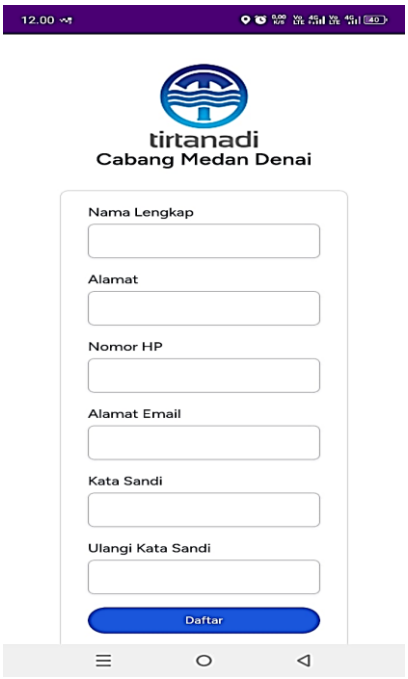

Figure 4 New User Registration Page

Dashboard page for users

In the image below is the display of the dashboard page for users where in this menu there is a user name, a complaint menu, and a complaint list menu.

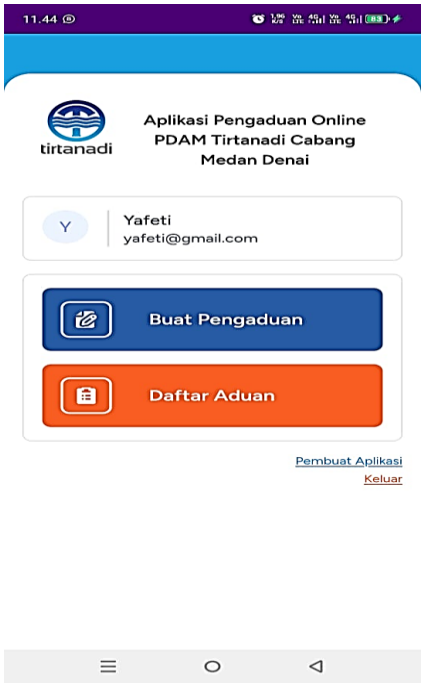

Figure 5 Customer Dashboard Page

Dasboar Pages For Admins

In the image below is the display of the dashboard page for users (admins) where on this menu there is a username (admin) of the complaint list menu.

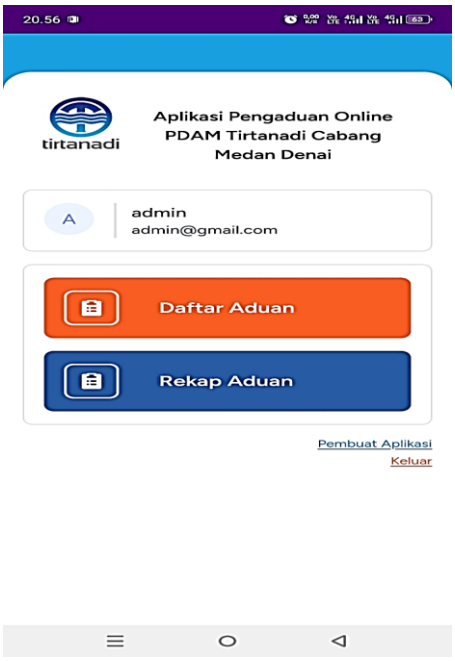

Figure 6 Dashboard Page For Admin

Complaint Recap Page

This page is a recap of all customer complaints will be listed here every week will display a list of complaints according to the date of entry of the customer complaint.

NO	NAMA	ADUAN	STATUS	TANGGAL
1	nimuru tempest	Air Mati	Selesai	2024-06-18
2	test	Air Mati	Selesai	2024-06-18
3	Andi L	Air Keruh	Selesai	2024-06-18
4	Dila	Air Mati	Selesai	2024-06-18
5	Tuti	Air Keruh	Selesai	2024-06-18
6	Fandi	Air Keruh	Selesai	2024-06-18
7	Murni	Air Mati	Pending	2024-06-18

Figure 7 Complaint Recap Page

Complaint Input Page

In the image below is a complaint input page, where on this page the user (complainant) will fill in such as: name, cellphone number, address, email, NPA (Water Customer Number), complaint type, complaint details, and upload image.

Figure 8 Complaint Input Page

Customer Complaint List Page

In the image below is a list of complaints menu for users where on this page all complaint lists for customers will be displayed. On the complaint list page, there are two pieces of information, namely process and completed.

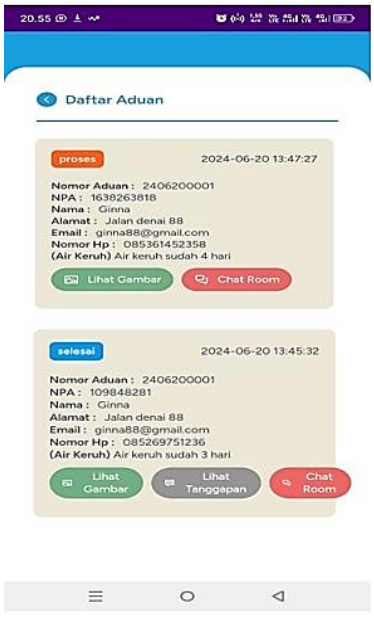

Figure 9 Customer Complaint List

Complaint List Page for Admins

In the image below is a display of the entire list of complaints from customers will be displayed here. On this page, new report information will also be displayed, namely with the "process" mark, while for reports that have been processed, it will be marked with "completed" information which indicates that the complaint or problem has been corrected. On the display of this menu list, there is also a response input button which is a button to notify the reporter

Figure 10 Complaint List Page for Admin

Chat Room Page for Admins and Customers

In the image below is a chat room page between the admin and the customer.

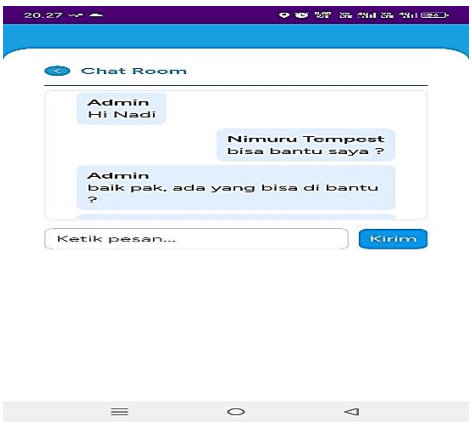

Figure 11 Chat Room Page

Response Input Page

In the image below is a response or reply input page from PDAM (admin) to provide information to customers that complaints (complaints) are ready to be processed.

Figure 12 Response Page for PDAM Admin

Page View Responses from PDAM (Admin)

In the image below is a page to see the reply information from the PDAM (admin) that the customer's complaint has been processed.

Figure 13 Page Viewing Responses from Admins

CONCLUSION

Fundamental Finding: The development of an Android-based complaint service application for PDAM Tirtanadi Medan Denai Branch has proven to enhance service efficiency, customer satisfaction, and accessibility, providing a timely response to issues such as water quality and meter malfunctions. **Implication:** This advancement suggests that leveraging mobile technology can play a significant role in improving public service quality, particularly in water utility management, by allowing customers direct, immediate communication and offering an alternative to traditional call centers. **Limitation:** Despite its advantages, the study did not quantitatively measure the impact on complaint resolution times or customer satisfaction rates, limiting the scope of evaluation to descriptive outcomes. **Further Research:** Future studies could examine the long-term effects of mobile complaint applications on overall service performance and assess scalability in other regions, including exploring user satisfaction through quantitative analysis to strengthen understanding of mobile service applications' efficacy in public sector utilities.

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