DESIGNING OF LOCATION MONITORING APPLICATION IN THE TANGERANG REGION WHICH IS SHOCKING WATER SOURCES BASED ON ANDROID

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Abstrak

Android adalah sistem operasi yang dirancang khusus untuk smartphone dan tablet. Sistem Android ini memiliki basis Linux yang digunakan sebagai pondasi dasar dari sistem operasi Android. Linux sendiri merupakan sistem operasi yang dirancang khusus untuk komputer. Sumber daya berupa air yang bermanfaat atau potensial bagi manusia, kesulitan dalam pemantauan sumber air menjadi kendala yang dirasakan masyarakat saat ini. Dengan bantuan kemajuan teknologi saat ini yaitu IoT (Internet of Things) dapat mengurangi permasalahan yang ada saat ini hanya dengan menggunakan smartphone android. Smartphone android berfungsi untuk mengirim dan menerima informasi melalui jaringan internet dan juga mempermudah komunikasi. Aplikasi ini dapat memantau sumber air masyarakat dengan mendapatkan notifikasi yang ada di sumber air. Dengan ini, masyarakat dapat menikmati hidup yang lebih sehat karena dapat mengontrol kebersihan sumber air dengan mudah dan praktis.

Kata Kunci: Android, Internet of Things (IoT), Pemantauan Sumber Air

Abstract

Android is an operating system that is specifically designed for smartphones and tablets. This Android system has a Linux base which is used as the basic foundation of the Android operating system. Linux itself is an operating system that is specifically designed for computers. Resources in the form of water that are useful or potential for humans, difficulties in monitoring water sources are an obstacle that is currently felt by the community. With the help of current technological advances, namely IoT (Internet of Things) can reduce the problem that exists today, using only an android smartphone. Android smartphones function to send and receive information via the internet network and also make communication easier. This application can monitor community water sources by obtaining notifications that are in water sources. With this, people can enjoy a healthier life because they can control the cleanliness of water sources easily and practically.

Keywords: Android, Internet of Things (IoT), Monitoring Water Sources

1. Introduction

Water is the source of life for living beings, especially humans, if there is no water there may be many obstacles that occur in this world. A small example of water use is that when we drink humans need fluids for the body, namely water, if water is not there then we will feel dehydrated. Not only consumed, water is also needed for daily activities such as bathing, washing clothes, washing dishes, and so on (Purnama, 2017). Water is also needed in various jobs such as electricity which is definitely necessary for mankind, water can be used for electricity plants or so-called hydroelectric power plants (PLTA). Indonesia is a country that only has 2 seasons, namely the dry season and the rainy season because Indonesia is a tropical country that is on the equator, where the line divides the two parts of the earth vertically (Karman & Mulyono, 2020).

If there is an area close to the equator, it will have a tropical climate. The dry season or dry season is a season that rarely rains. Prolonged drought results in rare rainfall, so if it rains rarely, there will be drought. In Indonesia, there are often droughts in each region, such as in 2019 the occurrence of El Nino, where the phenomenon of sea level temperatures heats up in the central to eastern Pacific Ocean (Adha & Muhallim, 2023) . There is this drought not only on the island of Java but also to Kalimantan and Sumatra. In Lebak, Banten province, 15 villages experienced drought and difficulty

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getting clean water, therefore residents there to meet their needs such as bathing, washing and so on had to go to the river flow and make holesin the river bank to collect water. Gresik area of East Java, 59 villages feel the difficulty of getting clean water, because of the difficulty of getting clean water, residents there are forced to buy water at PDAM (A. D. Putra & Alwi, 2018).

Therefore, in order to help the government in dealing with the problem of difficulty in obtaining clean water sources in the dry season, it is necessary to create something new by following the progress of the information technology era. Some people already have smartphones to provide news, find information, and for their personal needs (Nasution & Nusa, 2021). With the existence of smartphones owned by some people, it can be used to become a medium for monitoring water sources combined with the internet of things (IOT). Then the data obtained from every community in the Tangerang area that experiences a lack of water sources is given to the local government that experiences it (Candra & Ramadhan, 2020).

Therefore, I would like to design an application called The Drought Complaint Center (DCC), for community use if the area is experiencing a shortage of water sources (Usup & Susafaati, 2021). It is hoped that this application design can make areas that lack water more quickly respond to the situation (Basith & Kurniadi, 2017). This DCC is an intermediary to give a message to the surrounding government to be quickly dealt with(S. D. Putra et al., 2020) . People are also advised to monitor water sources in their respective areas. To determine the location or central point of the problem of areas experiencing water shortages to the nearest government, the application will be equipped with a Global Positioning System (GPS). After filing a complaint on the application must be completed by providing the appropriate location (Rizal & Latifah, 2017).

2. Theoretical Basis & Research Method
2.1. Theoretical Basis
a. Water Sources

Water sources are natural resources that meet the lives of many people, so they need to be maintained in quality so that they are still beneficial for the lives and lives of humans and other living things. Water is all water that is contained in and or comes from a water source, and is located above ground level, not included

in this sense is water that is located below the surface of the ground and seawater.

b. Android

Android is defined as a software used on mobile devices that includes a middleware operating system, and a key application released by Google. So That Android covers the entirety of an application from the operating system to the development of the application itself.

c. Internet of Things

The Internet of things in a broad sense makes everything in the world connected to the internet that is connected continuously. The Internet of things can control, send data, and so on that utilize the internet so that it can be done remotely without knowing the distance

d. Global Positioning System (GPS)

GPS is a satellite navigation system that provides information and location in any weather conditions, as long as it still receives GPS signals emitted from satellites.

2.2. Research Method and Materials

The methodology of designing this DCC application is RAD which is divided into several stages, namely planning, data collection, analysis and design, implementation.

a. Planning

In this section the researcher wants to find out how the situation in various areas in the Tangerang area is experiencing a long dry season and also resulting in a shortage of water sources. With this I would like to make a questionnaire about how the government's attitude in overcoming this problem, especially the speed in dealing with this problem. Questionnaire about the problem was then analyzed and planned to make the Drought Complaint Center (DCC) application.

b. Data Collection

This data collection uses a questionnaire and will later be given to the community in a direct manner in the Tangerang area which often experiences a shortage of water sources.

c. Analysis and Design

1. Analysis of functional system requirements and analysis of non-functional system requirements
2. Analysis of the current system and follow-up systems

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d. Implementation

The results of the Drought Complaint Center (DCC) application design will be implemented on an Android-based smartphone which will later be used by the community to inform the Tangerang area that is experiencing a shortage of water sources. The following is the implementation of the results and design:

Mobile Application

Software
a. Android nougat operating system
b. 32GB ROM
c. 2GB RAM

Hardware
Samsung Galaxy A10

e. Testing

Application testing using black box

3. Results and Discussion

The Drought Complaint Center (DCC) application has been developed using a prototype but has not been tested to the surrounding community. The trial process has been carried out on several Android-based smartphones that have the DCC application installed to test whether it is in accordance with what was planned. Because this DCC application was created for to help the community to be quickly handled by the government, it must be tested until this application is really mature and ready to be used by the community.

The use of this application starts like any other application, which is to install it first and then fill in the personal data form to create an account on the DCC application.

The architectural design of the Drought Complaint Center (DCC) system uses an internet-connected smartphone media. This application requires data entry by the reporting community and also requires a Global Positioning System (GPS) to provide a more specific point or position. Complaint data received by the parties government stored in the database. Here is a figure 1 system architecture.
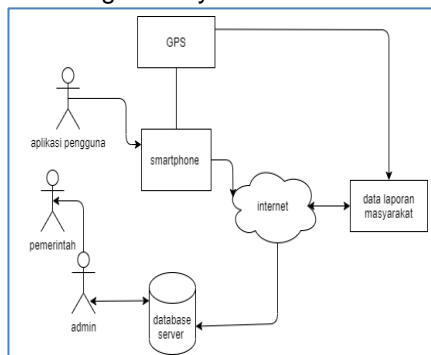

Figure 1. System Architecture

The flow of this application is when there is an area in Tangerang that is experiencing a shortage of water sources, they will use this application on condition that they have an account and have a connected internet network. by using the Global Positioning System (GPS). Later the data provided by the community will be directly entered into the system of the local government so that it can be handled directly. Here's picture 2 flowchart.
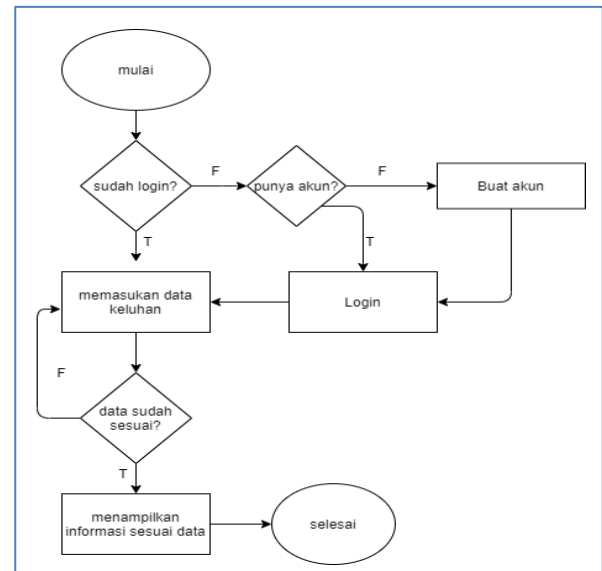

Figure 2. Flowchart

3.1. Needs Analysis

At this stage the needs analysis is used to define the requirements of the system to be developed. This needs analysis is divided into 2, namely functional and non-functional requirements analysis.

a. Functional Needs

Requirements that contain any service processes that will have to be provided by the system, including how the system should react to certain inputs and how the system behaves in certain situations. This application system must have user data, have data provided by users about the area in tangerang which is experiencing drought. This analysis is done by making some diagrams of the United Modeling Language (UML). By using UML we can create models for all types of software applications, where these applications can run on any hardware, operating system and network, and are written in any programming language.

b. Non-Functional Needs

Requirements that emphasize the behavioral properties possessed by the system. functional requirements are also often referred to as service limitations or functions offered by

the system such as time limits, process development limitations,standardization and others. RAM of 2 GB. And also has an internet network when accessing applications.

3.2. Running System Analysis

When people experience a shortage of water sources in their area, they will definitely report it to the local government nearby for a quick response. But if their area is far from the surrounding local government, they will find it difficult to get there and it will take time.

3.3. Follow-up System Analysis

In this proposed system, the DCC application will help shorten the time by registering first if you don't have an account, after that, log in, on the main page, people can immediately report complaints about their water sources that are starting to dry up, for the exact location, people must use GPS. to provide a location. After all the data is filled in, then the public can send complaints to the DCC application. Figure 3 is an activity diagram for the DCC application.
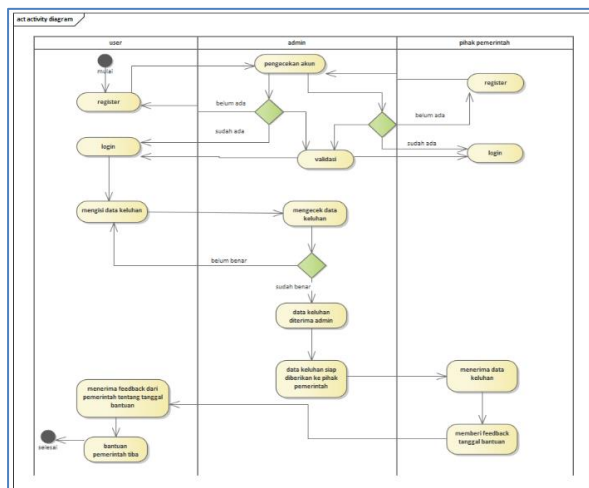
Figure 3. activity diagram follow-up

3.4. Software Design

Use Case Diagram is a status diagram that shows a set of use cases and actors (a special type of class) Murad (2013:57)[5]. In this DCC application, the user can make a complaint by filling in the complaint data, the conditions for which must provide complete address and provide location with GPS. Users can also get feedback on the date of assistance from the government on condition that the data must be correct and validated. The admin role is to receive community complaints reports, before being accepted, the admin checks whether it is correct or not. After that the admin gives the data to the government if the data is correct. The government will receive the correct complaint report data by the admin. After that the government will provide feedback on the

date of assistance for the community by giving notifications to the reporting community.
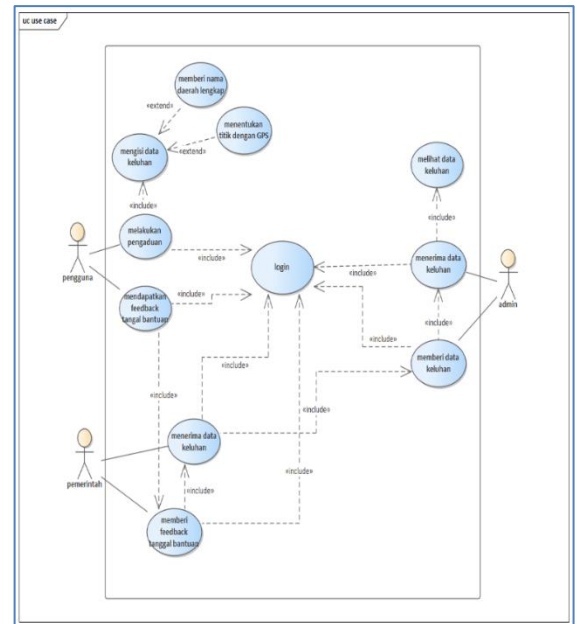

Figure 4. Use case diagram
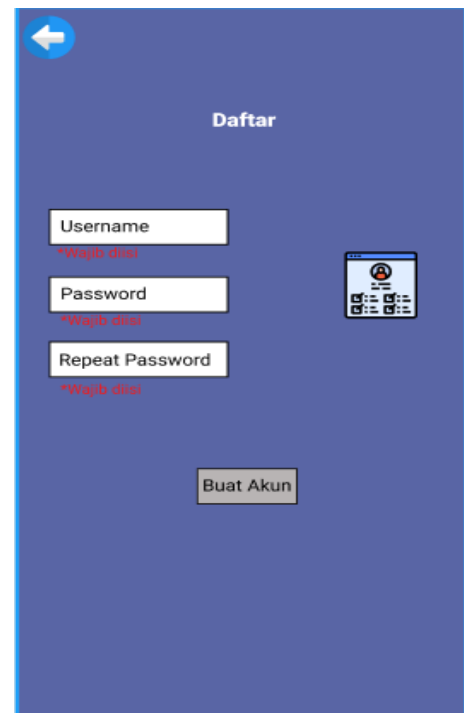
3.5. Application Interface

Figure 5. Home page

This is the initial page that appears when you open the DCC application, here is a login if you already have an account and registration if you don't have an account.

If you choose login, a page like figure 6 will appear, here the user enters the username and password to enter the home page.

Figure 6. Login page

Figure 8. Final registration page
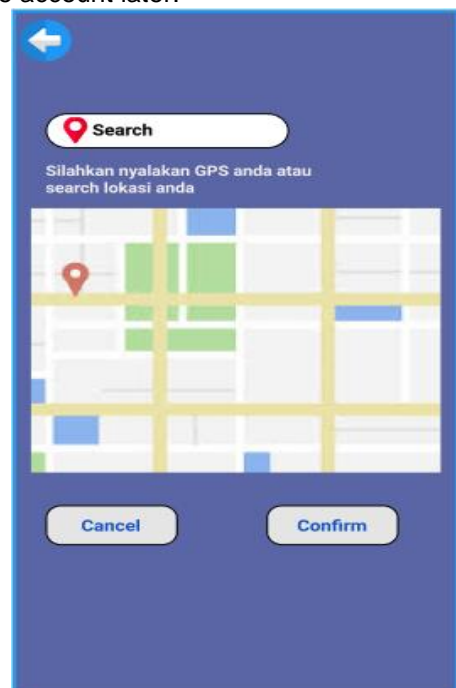
Furthermore, the user is required to fill in the username and password that will be used for the account later.

Figure 7. Registration page

Figure 9. Location determination page

If you choose to register, a page like this will appear, here users who do not have an account are required to fill in personal data consisting of name, address, district/city, sub-district and village. If you have clicked the next button.

On this page users are required to turn on their GPS or find their own location

If you click the get to know button, a page like this will appear, here the user can find out the purpose of using this application properly.
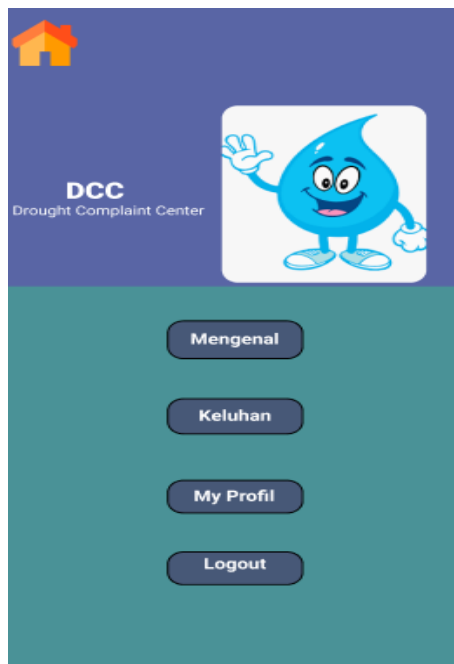

Figure 10. Home page of the application

This is the home page, where the user is shown a knowing button to find out the purpose of this application, a complaint button to fill out a complaint, a profile button to view your profile and a logout button to exit the application.

Figure 12. Filling in about community complaints

If you click the complaint button, a page like this will appear, here you can fill in a complaint about a lack of water sources in your area.

Figure 11. Contents of the recognize button

Figure 13. Profile page

If you click the my profile button, a page like this will appear, here you will see the user's full profile.

Figure 14. Logout page

If you click the logout button, a page like this will appear to exit the application.

4. Conclusion

The conclusion in this journal can be concluded that this application uses an android smartphone. This application is used for people whose areas experience a shortage of water sources. How to use this DCC application is to just open the application and fill in the complaint about water sources in your area.

5. References

Adha, N., & Muhallim, M. (2023). Perancangan aplikasi penyewaan kendaraan berbasis android di palopo. 2(1), 18–27.

Basith, G. H., & Kurniadi, D. (2017). Perancangan Sistem Informasi Pemetaan Pariwisata Garut Berbasis Geografic Information System Dan Android. Jurnal Algoritma. Https://Doi.Org/10.33364/Algoritma/V.14-1.26

Candra, F., & Ramadhan. (2020). Perancangan Aplikasi Pariwisata Kuantan Singingi Berbasis Android Menggunakan Push Notification Dan LBS. JURNAL FASILKOM. Https://Doi.Org/10.37859/Jf.V10i1.1908

Karman, J., & Mulyono, H. (2020). Perancangan Sistem Informasi Geografis Lokasi Objek Wisata Di Kota Lubuklinggau Berbasis Android (Studi Kasus Dinas Pariwisata Kota Lubuklinggau). JSI: Jurnal Sistem Informasi (E-Journal). Https://Doi.Org/10.36706/Jsi.V12i1.9501

Nasution, W. S. L., & Nusa, P. (2021). UI/UX Design Web-Based Learning Application Using Design Thinking Method. ARRUS Journal Of Engineering And Technology, 1(1), 18–27.

Purnama, W. G. (2017). Perancangan Perangkat Lunak Pemantau Lokasi Anak Berbasis Android. Infomatek. Https://Doi.Org/10.23969/Infomatek.V18i1.507

Putra, A. D., & Alwi, A. (2018). Perancangan Aplikasi Pencarian Lokasi Rumah Sakit Dan Klinik Di Wilayah Kota Madiun Berbasis Android. Komputek. Https://Doi.Org/10.24269/Jkt.V2i2.135

Putra, S. D., Aryani, D., Nasution, W. S. L., & Wahyu, S. (2020). Pemanfaatan Teknologi Informasi Dan Komunikasi (Tik) Dalam Pembelajaran Daring Di Era Pandemi Di Smpit Insan Rabbani. Jurnal Abdidas, 1(6), 640–646.

Rizal, M., & Latifah, F. (2017). Perancangan Aplikasi Lokasi Wisata Kota Jakarta Menggunakan Algoritma Sequential Search Berbasis Android. None.

Usup, R. M., & Susafaati, S. (2021). Perancangan Aplikasi Informasi Bengkel Mobil Daerah Jakarta Barat Berbasis Android. JIKA (Jurnal Informatika), 5(2), 174. https://doi.org/10.31000/jika.v5i2.3618