



**Perancangan Aplikasi *Mobile Tracking* Covid-19 dan Vaksin Berbasis  
Android (Studi Kasus : Desa Cirarab Kabupaten Tangerang)**

*TUGAS AKHIR*

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PROGRAM STUDI TEKNIK INFORMATIKA  
FAKULTAS ILMU KOMPUTER  
UNIVERSITAS MERCU BUANA  
JAKARTA  
2022



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Android ( Studi Kasus : Desa Cirarab Kabupaten Tangerang)**

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Diajukan Untuk Melengkapi Salah Satu Syarat  
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Pandu Airlangga Irawan

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**NASKAH JURNAL**

# Design of a Covid-19 Mobile Tracking Application and Android-Based Vaccine (Case Study: Cirarab Village, Tangerang Regency)

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**Abstract**

*The spread of the Covid-19 virus over the past 2 years has had a lot of impact on people's lives. People are worried and worried about the spread of the Covid-19 virus which is increasingly taking more victims. Several efforts to prevent the spread of the COVID-19 virus have also been carried out by the government by direct counseling to the public on the importance of "working/studying from home", and "self-isolation" for residents who build the Covid-19 virus. In addition, the government also requires all people to get vaccinated against COVID. Vaccination is carried out simultaneously and gradually with 3 doses, this is done in order to suppress the spread of covid-19. Therefore, the use of technology is urgently needed to monitor the spread of the covid-19 virus and also to monitor people who have implemented the covid vaccine. By proposing a tracking application design, researchers will design a mobile application with the development of location-based service methods. This application will be integrated with the Google Maps API so that it can unify the spread of the covid-19 virus and vaccination, especially for residents of the Cirarab sub-district, Tangerang Regency as the subject of this research. The expected results from this research are in the form of a map of the location of residents who are affected by COVID-19 and a map of the location of residents who have been vaccinated. The results of the black box testing of all functionalities can run according to the expected response. As for testing from a sample of 20*

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*registered residents, the results of the trial are successful for logging in and the application can be used as expected.*

**Keywords:** Tracking, Covid-19, vaccination, Android mobile, Location Based Service



## INTRODUCTION

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) or now known as Coronavirus Disease 19 (Covid-19), which was first detected in Wuhan, Hubei, China at the end of 2019, is a virus that can attack human respiration. The virus causes mild disorders on the respiratory system, severe lung infections, and even death.

The Covid-19 virus that has shocked the world is still the center of attention, including our country. Indonesia is one of the countries that has the highest spike in positive cases, with some recoveries cases are being reported, although not a few of them who die, according to the data from the Indonesian Ministry of Health which is updated every day. The Indonesian government is still trying to reduce the confirmed cases by implementing policies such as stay at home, PSBB (Large-Scale Social Restrictions) and the latest, that is still being implemented is PPKM (Enforcement of Restrictions on Community Activities).

PPKM is one of the policies that the government is currently implemented to prevent a spike in the positive cases. There was a surge in the second wave when PPKM was implemented in the community, making Indonesia as one of the countries who has the highest death cases in Southeast Asia, with a total of 102,375 death cases in August 2021.

The government carried out the Covid-19 vaccination program to prevent an increase in Covid-19 cases. In this case, President Joko Widodo is the first person in Indonesia to be injected with the Sinovac vaccine at the State Palace. Vaccination is carried out simultaneously and gradually to health workers and health support personnel in 34 provinces in Indonesia. The Ministry of Health continues to monitor and evaluate to the extent that prospective recipients of the Covid-19 vaccine register and verify data. In this case, the role of technology is very important, with the advanced

development of science and technology, information about Covid-19 can be obtained quickly and accurately based on trusted data.

The real-time distribution of the COVID-19 outbreak is currently needed by the community. In this case, mobile-based technology is the most widely used. Mobile-based Android can provide a more interactive visualization. With the current technology, Android-based mobile applications are able to exchange data in real time. This is done by merging the data obtained from various sources in the application programming interface (API), and then it can be visualized on the Covid-19 tracking application in real-time.

In this study, the researcher will design an android-based application to help monitor and record cases of Covid-19 and vaccines in the Cirarab Village, Tangerang Regency.



## RESEACH METHODS

At this stage, the research carried out is to design a software and develop it using the Software Development Life Cycle (SDLC) with a prototype model. Before carrying out the system development stage, the author makes a flow to determine the topic, problem analysis, literature study, and data collection that will be conducted before performing the system development stage.

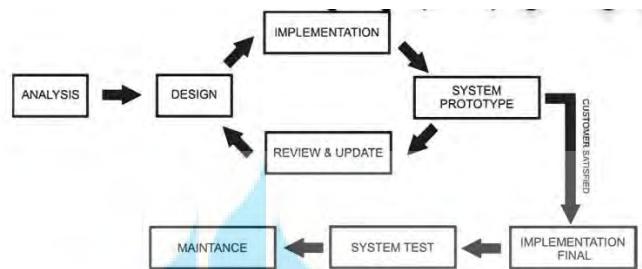


Figure 2.1 Prototype Model

The stage of research work that will be used in the Design of the Covid-19 Mobile Tracking Application and Android-Based Vaccine (Case Study: Cirarab Village, Tangerang Regency).

This research is classified as a quantitative research, where the data is taken from internal data of the Cirarab Village Head Office, Tangerang Regency.

At this stage, the procedure is conducted scientifically to find, compile, analyze, and conclude the data so that it can be used to find, develop, and test the truth of a research.



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**Figure 2.2 Research Stages**

Figure 2.2 shows the steps involved in designing the Covid-19 and vaccine tracking application system:

1. Identify the problem.

At this step, the identification of existing problems is carried out. The problem in this research is that the Village Head still has difficulty in detecting the residents who are infected by the Covid-19 and the residents who have or have not got the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> vaccines.

2. Literature study.

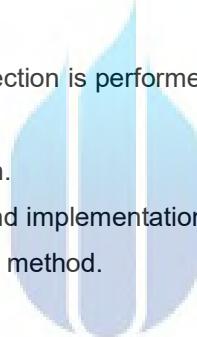
In the second step, the data was collected from the previous studies.

3. Data collection.

At this stage, the data collection is performed using the bibliography and observation method.

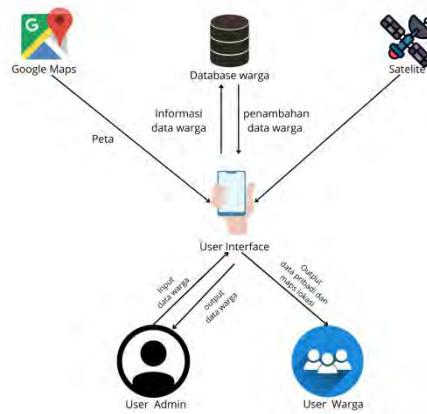
4. Design and implementation.

At this stage, the design and implementation of the tracking application is done using the Prototype development method.



### 2.1. Business process

The following figure is a business process that explain more detail about the flow of the application that will be created.



**Figure 2.3 Software Engineering for Covid-19 Mobile Tracking and Vaccination Applications**

From the figure above, it can be observed that the first stage is the admin user inputting citizen data into the application. Then the data that has been inputted will be stored in a database. Among the data that has been inputted is the complete address data of residents which determine the coordinates of the residents' locations. In taking the coordinates, the system will use GPS. Furthermore, to get maps and routes, the system uses the google maps API by providing the parameters of the earth coordinates. After sending these parameters to google map, the google map server will reply in the form of a static map and show a route that will be displayed to the user. On the resident user interface, maps and points will appear in the form of residents' locations according to the desired page choice. For example, if the user selects the covid page, then the maps and location points of residents who are being affected by the covid will appear. This is also applied for the page menu of the first, second and third dose of vaccinations.

## 2.2. Location Based Service (LBS) Method



Figure 2.4 Location Based Service Technology

In the usage of the location-based services, there are five components of the Location Based Service technology:

1. Mobile Device. It is a tool used to request the required information. They include Mobile Phones, laptops, PDAs and other devices that support navigation facilities.
2. Communication Network. It is a cellular network that transmits user data and service requests.
3. Positioning Technology. The user's position can be obtained by using a communication network or by using the Global Positioning System (GPS).
4. Service and Application Provider. It is a service provider for cellular users who is responsible for processing services.
5. Data and Content Provider. It is the data information service providers that can be requested by users.

### 2.3. Use Case Diagram

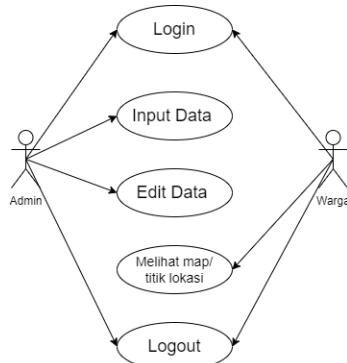


Figure 2.5 Use Case Diagram

The above figure is a use case diagram. It shows the relationship between actors and the system. It also describes an interaction between one or more actors and the system which will be created. Here is the description of the use case above:

**Tabel 1.** Use Case Diagram

No	Actor	Description
1.	User Admin	Admin login to be able to enter into the application. Admin users can edit / input citizen data from the application User admin logout to exit the application
2.	Resident User	Resident user logs in to enter the application. Resident users can see a map/location point containing the location points of residents who are being affected by Covid-19, residents who have taken the first dose of vaccine, and residents who have had the third vaccine. Resident users logout to exit the application.

## 2.4. Flowmap

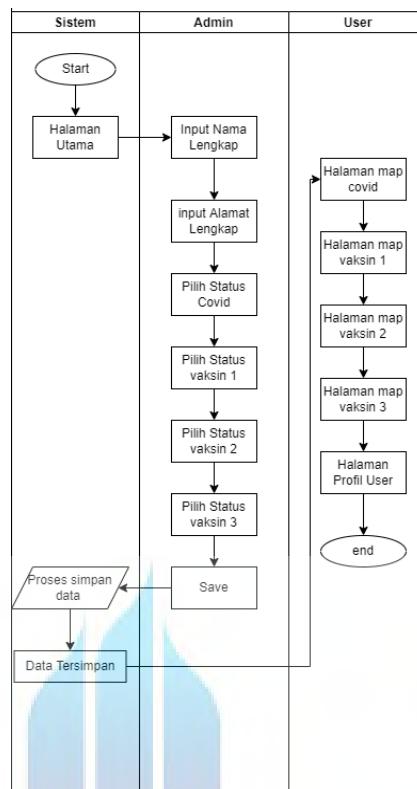


Figure 2.6 Flowmap

The above figure is a flowmap of the system that will be built. It shows the movement of activities that are defined in more detail. Every detail of the activity has a direction and Steps in a clear order.

## 2.5. Citizen user system flowchart

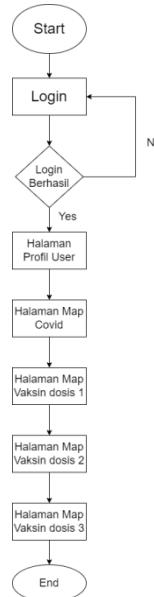


Figure 2.7 Citizen User System Flowchart

The above figure illustrates the system flow from the resident user. It starts from the residents who log in first before accessing the application. If the user successfully logs in, the resident user will enter the main page. On the main page, the resident can access the user's profile to see the user's own profile.

## 2.6. User Admin System Flowchart

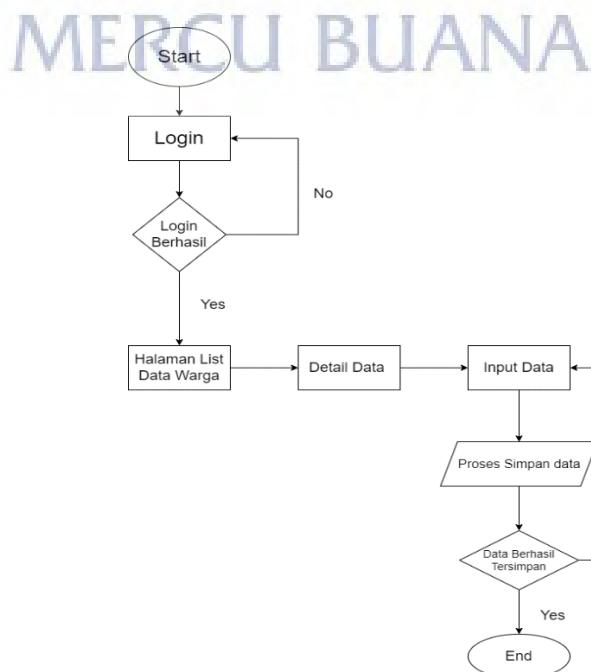


Figure 2.8 User Admin System Flowchart

The figure above shows the system flow from the admin user. It starts from the admin login. If the login is successful, it will go to the main page which contains the resident data list page. If the admin clicks on one of the names from the list of residents' names, it will go to the data detail page. The resident data detail page contains detailed data ranging from full name, complete address, date of birth, covid status, status of the first, second and the third dose of vaccine. In the admin user, there is also a feature to add citizen data.



## RESULT AND DISCUSSION

### Experiment Stage Flowchart

This section explains the steps of experiments which are performed for system testing. The following is a flow chart of the experimental stages:

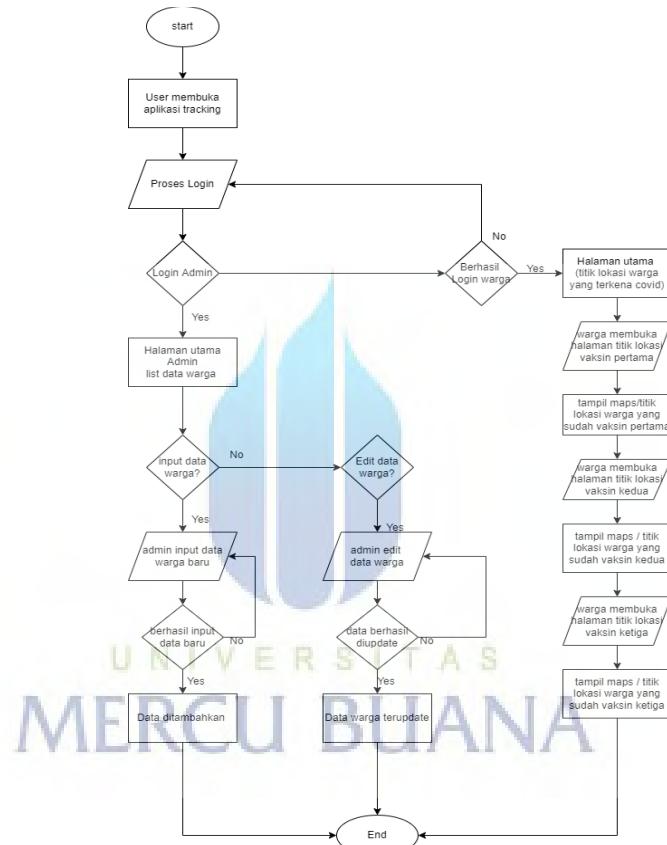


Figure 3.1 Flowchart of Experimental Stages

### Experiment Display

First, the user accesses the tracking application, then logs in according to their respective access rights. The admin logs in with the username that has been set, while for the residents to log in by entering the username in the form of full name and the password in the form of date of birth.



Figure 3.2 display login  
3.4 Display edit data

Figure 3.3 Display data input

Figure

After the user logs in according to their access rights, the admin user will enter the resident data list page. On this page, the residents' data that has been previously inputted will be presented, including the data input pages and data edit pages.

## Experiment Results

After conducting the experiments by carrying out activities on the application, the following results were obtained:

Data Warga	
BILAL HAMIZAN RABBANI	POSITIF
JEFRI ANDI SIMBOLON	POSITIF
RYAN PUTRI	NEGATIF
GEA NUREGA	NEGATIF
M. SAEFUL	POSITIF
YOSIH APITA	NEGATIF
IBRAHIM MAULANA	NEGATIF
RAHMA AULIA	NEGATIF
SISKA MUSTIKA	POSITIF
SUTRIONO	POSITIF
SUCIATI	NEGATIF

Figure 3.5 admin main page display

Figure 3.6 detail view and edit data

On the citizen data list page, the name and covid status of the resident is displayed. Clicking one of the names will direct the user to the data detail page.

On the data detail page, details of the selected resident are presented. On this page the admin can edit the data, edit the covid-19 status, edit the status of the first, second or the third dose of vaccine. After that, there is a save button to save the results of the data changes.

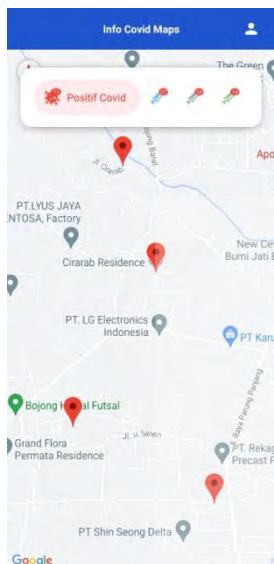


Figure 3.7 Main pag

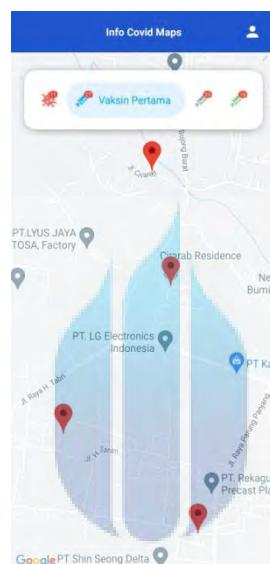


Figure 3.8 Vaccine page 1

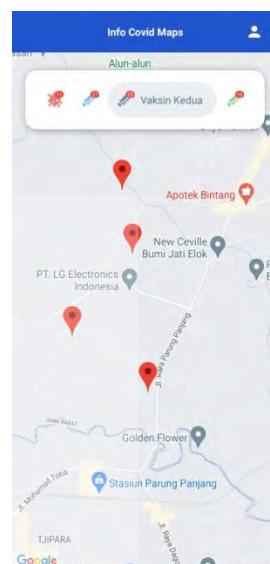


Figure 3.9 Vaccine page 2

Status Covid	negatif
Vaksin Dosis Pertama	<input checked="" type="checkbox"/>
Vaksin Dosis Kedua	<input checked="" type="checkbox"/>
Vaksin Dosis Ketiga (Booster)	<input type="checkbox"/>

Figure 3.10 Vaccine page 3

Figure 3.11 User profile page

- a. On the maps page or the location points of residents affected by the Covid-19, maps will be presented according to the points of residents who are being affected by Covid-19.
- b. The first vaccine page contains maps of the location of residents who have taken the first dose of vaccine.
- c. The second vaccine page contains maps of the location of residents who have already got the second dose of vaccine.
- d. The third vaccine page contains maps of the location of residents who have taken the third dose of vaccine (booster).
- e. On the user profile page, the user's name, date of birth, covid-19 status, and vaccine status are presented.



## CONCLUSION

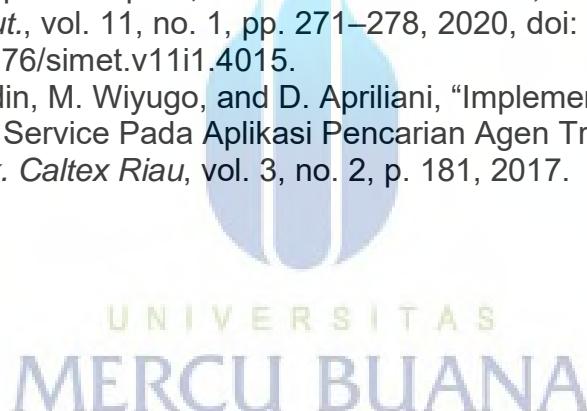
The Covid-19 and Vaccine tracking application, which has been developed through this research, using the location-based service method that is integrated with the Google Map API is able to monitor the Android application users who are infected by the Covid-19 virus, and who have been injected with the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> (booster) vaccines in the Cirarab Village, Tangerang Regency, Banten. The Covid-19 and Vaccine tracking application can determine the coordinates dynamically by using the data of residents who have got the vaccines, so that finally it can motivate the residents who have not got the dose to get vaccinated.



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## KERTAS KERJA

### Ringkasan

Kertas kerja ini merupakan material kelengkapan artikel jurnal dengan judul Perancangan Aplikasi *Mobile Tracking Covid-19* dan Vaksin Berbasis Android (Studi Kasus: Desa Cirarab, Kabupaten Tangerang) yang berisi semua material hasil penelitian Tugas Akhir yang tidak dimuat atau disertakan di artikel jurnal. Dalam kertas kerja ini akan dijelaskan mengenai literature review, dataset yang digunakan, serta langkah-langkah perancangan, tahapan implementasi dan hasil pengujian penelitian. Berikut penjelasan singkat yang terdiri dari 6 bagian sebagai berikut:

#### 1. Literature Review

Pada tahap ini membahas mengenai literatur yang berisi artikel jurnal yang menjadi dasar atau landasan dalam penelitian ini.

#### 2. Analisis Dan Perancangan

Pada tahap ini menjelaskan analisa perancangan dari aplikasi dan alur kerja pada Aplikasi *Mobile Tracking Covid-19* dan Vaksin.

#### 3. Source Code

Pada bagian ini menjelaskan mengenai beberapa source code yang digunakan pada penelitian ini.

#### 4. Dataset

Pada bagian ini menjelaskan mengenai dataset yang digunakan meliputi penjelasan, cara perolehan data, variabel data dan pemrosesan data, sehingga data siap diolah.

#### 5. Tahap Eksperimen

Pada bagian ini memuat tahapan eksperimen yang disajikan dalam gambar dengan penjelasan dari setiap tahapan.

#### 6. Hasil Eksperimen

Pada bagian terakhir dari kertas kerja ini menjelaskan hasil keseluruhan dari eksperimen yang telah dilakukan, meliputi penjelasannya.