Chain Breaker

Documentation

By The Game Changer

1.0 Introduction

Coronavirus disease (COVID-19) is an infectious disease caused by a new virus. The disease causes respiratory illness (like the flu) with symptoms such as a cough, fever, and in more severe cases, difficulty breathing. You can protect yourself by washing your hands frequently, avoiding touching your face, and avoiding close contact (1 meter or 3 feet) with people who are unwell (Google, 2020). *Figure 1* shows pandemic condition in Malaysia as of 13 April 2020 (Wikipedia, 2020).

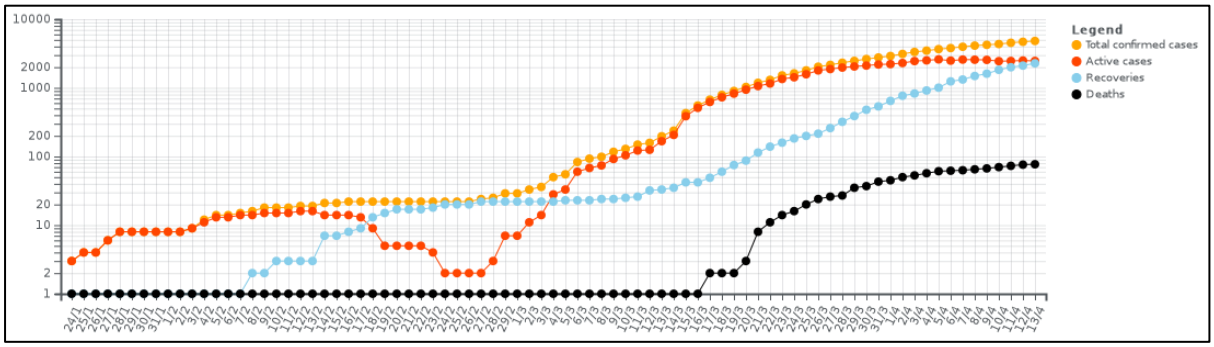


Figure 1. Pandemic condition in Malaysia (Wikipedia, 2020).

2.0 Problem statement

Once a citizen is infected, current situation in Malaysia is that the hospital asks the patient to recall back where they have been for the past 14 days, where most of the people cannot recall it entirely. Even if the patient has recalled back all the locations, other citizens may forget that they actually passed the area coincidently and did not take actions (get virus test/ self-quarantine). A lot of patients who are infected in fact do not know why they get infected. Hence, we want to automate the process of recalling and calculating to give clear insights to a citizen if they are at risk or not. Our team believes a lot of us are actually scared, even if we stay in the house all day, that we have actually already got the disease.

3.0 Objectives

1. Provide users with latest data and statistics on the pandemic.
2. Notify users if they have potentially come into close contact or is a high risk of entering an area with confirmed cases.
3. Enables users to be informed and take necessary precautions.

4.0 Unique features

This is a general tracking and tracing application that does not only aim for the Covid-19. Our team hopes to develop an application that tracks on any virus not only for this stage, but also for the future if another wave engulfs the world.

5.0 Application interfaces (front end)

5.1 Design of application

There are two groups of users using the application, which are the ***citizens*** and the ***admin (government/ MOH)***. The application pages are divided into a toolbar menu with main functions and a hamburger menu including other minor functions (See *Figure 2*).

Menu	Menu number	Interface	
Toolbar menu	1	Latest info	
	2	Citizen	Risk identifier
		Admin	Monitoring
	3	Virus hotspots	
Hamburger menu	1	Profile	
	2	Inquiry	
	3	About us	
	4	Sign out	

Figure 2. Application design.

5.2 Sign in/ sign up/ sign out

First, users get to sign in (See *Figure 3*) or sign up (See *Figure 4*) to the application as different users have a unique id indicated by their phone numbers. This being one of our application sell point as we do not require users to enter too much of their information that may be invasive.

Figure 3. User sign in interface.

Figure 4. User sign up interface.

5.3 Risk identifier

After a user has signed into our application, he will be brought to the risk identifier page (See *Figures 5* and *6*). This page shows if a user is safe from the virus or at high risk, after calculations and analysis have been done. Note that there is a [Tracking] button, where users can choose if they want to be tracked or not, due to privacy issue. The data of where they have been will only be logged into our system when they choose to be tracked.

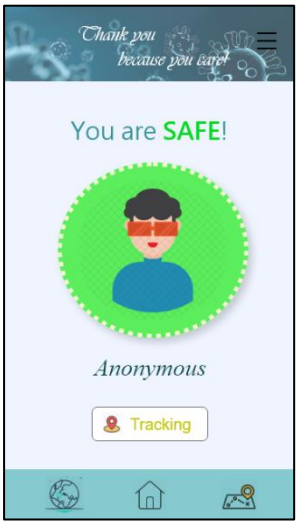


Figure 5. Risk identifier page showing riskless citizen profile.

Figure 6. Risk identifier page showing at risk citizen profile.

5.4 Virus hotspots

Based on the virus cases, our system analyses and predict next high-risk areas, called the virus hotspot to be shown to the citizens (See *Figures 7 - 10*). This function is to alert the citizens so that they can avoid going to the virus hotspots. Furthermore, if they stay near the hotspots, they would be more cautious.

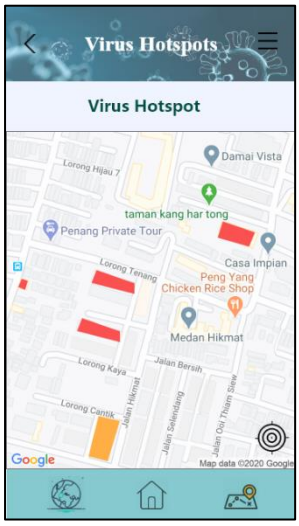


Figure 7 Virus Hotspots interface.

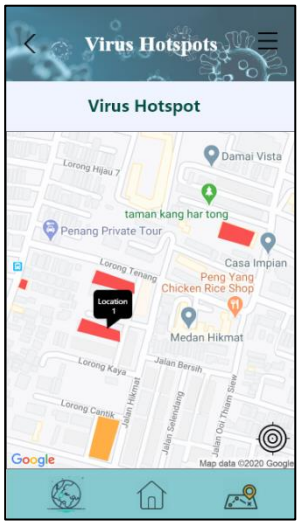


Figure 8. Virus Hotspots interface when location 1 is pressed.

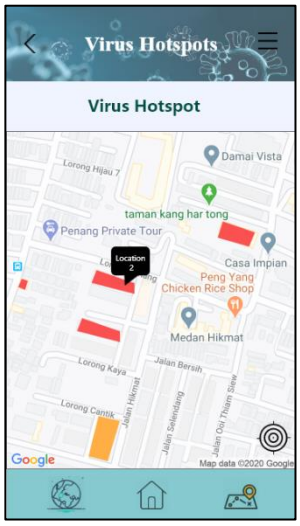


Figure 9. Virus Hotspots interface when location 2 is pressed.

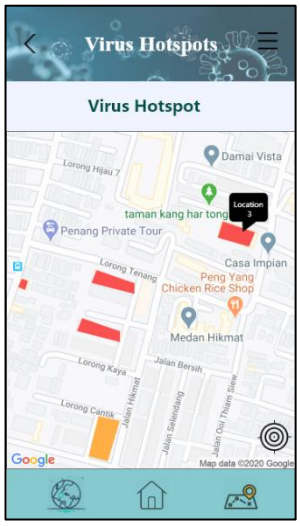


Figure 10. Virus Hotspots interface when location 3 is pressed.

5.5 Latest info (Virus statistics)

Besides, the application shows the latest information about the virus statistics to get the citizens always updated. Our team also hopes that with this information, the citizens would be more aware of the danger and severity of the disease. We are providing information not only locally in Malaysia, but also globally all around the world (See *Figures 11 - 16*).

Figure 11. Latest information page.

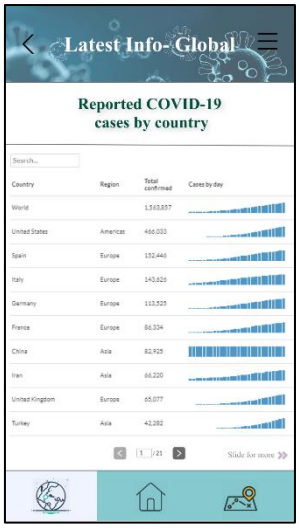


Figure 12. Latest Global information after selecting the [Global] option.

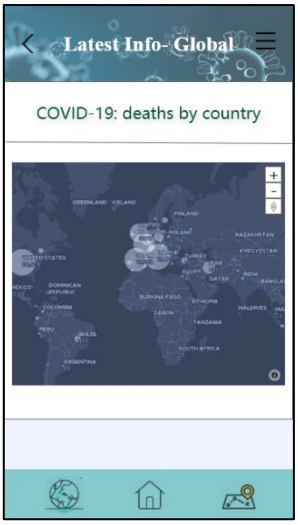


Figure 13. Latest Global information after sliding for more.

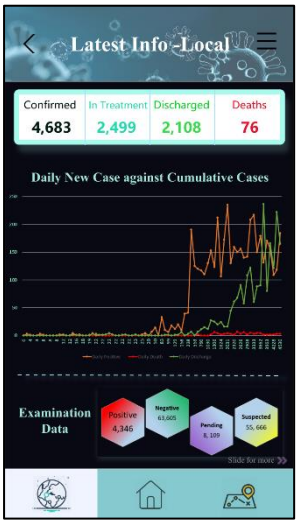


Figure 14. Latest Local information after selecting the [Local] option.

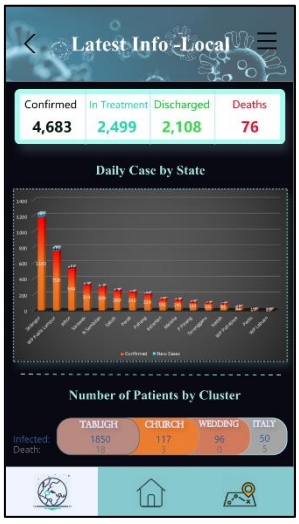


Figure 15. Latest Local information is categorized by clusters after sliding for more.

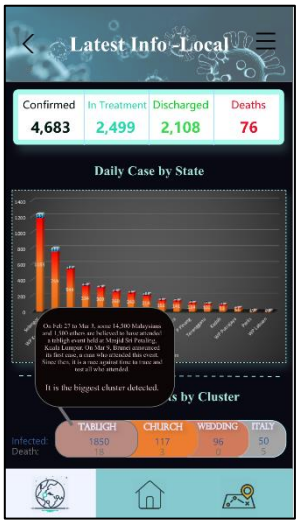


Figure 16. Description of cluster Tabligh appears after [Tabligh] is selected.

5.6 Profile

Users can view their profile at the profile page as shown in *Figure 17*. Here, they can also modify their names, phone numbers and password.

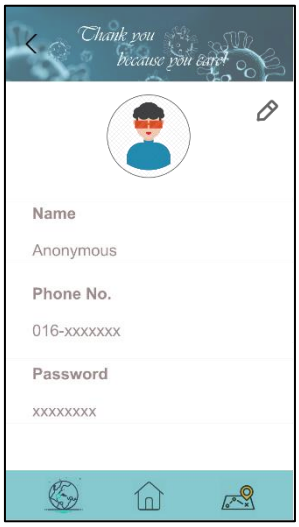


Figure 17. Profile page.

5.7 Inquiry

The inquiry page is a question-and-answer page where users can understand more about the application, and actions to be taken to fight with the virus (See *Figures 18* and *19*).

Figure 18. Inquiry page.

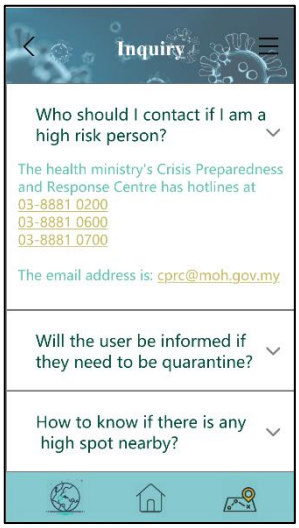


Figure 19. Inquiry page shows answer related to question when [v] button is pressed.

5.8 About Us

Through the About Us page, users get to know more about the application (See *Figure 20*). Users would also understand basic objectives of the application.

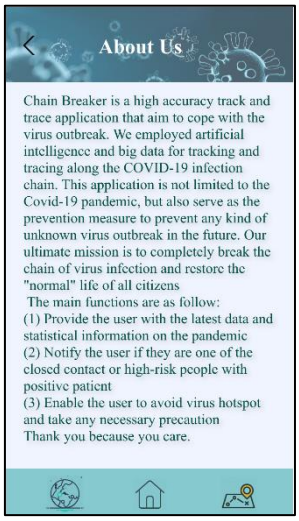


Figure 20. About Us page.

5.9 Admin interfaces

Admin plays a very important role in the application. Our targeted admin will be the government or the Ministry of Health (MOH). As the admin, they know who closed contact people and in risk people are (See *Figures 21* and *22*).

Figure 21. Admin knowing who closed contact people are.

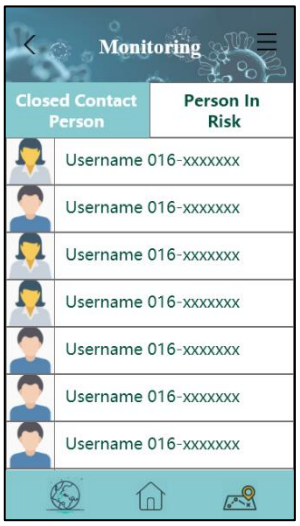


Figure 22. Admin knowing who people in risk are.

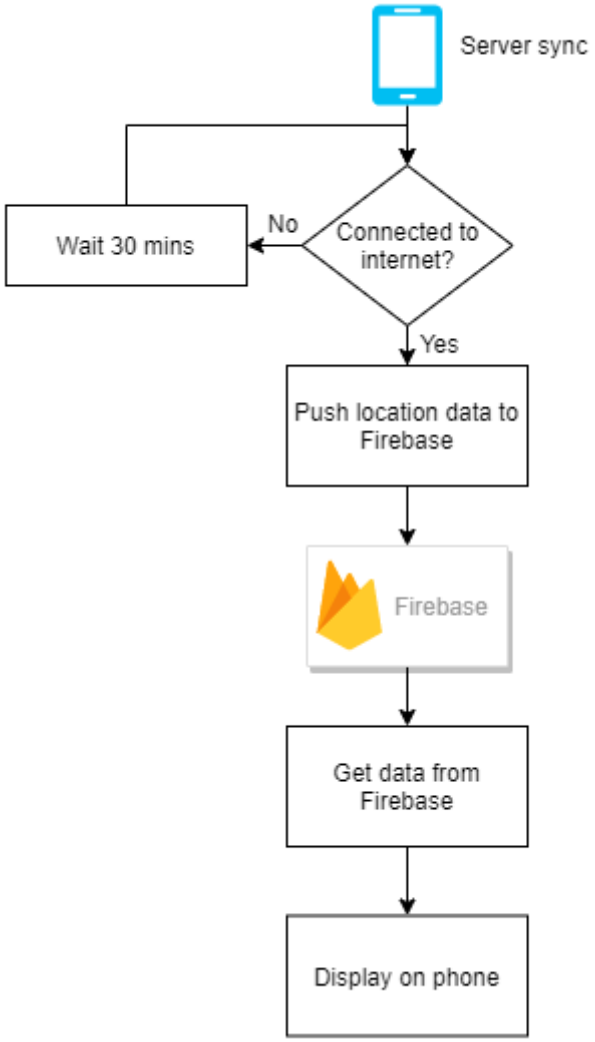
6.0 Application backend

Below are technologies used in the backend of the application.

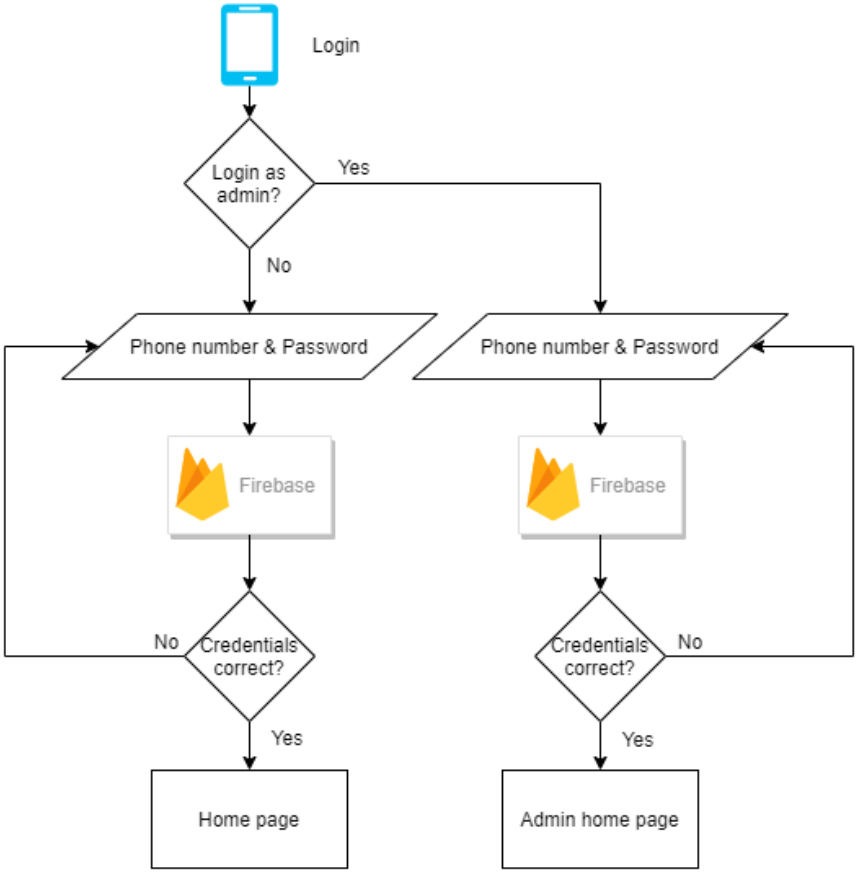
Items	Technologies
Application building application	Android Studio
Database server	Firebase
High risk people and places analysis	R
Low-fidelity prototype	Adobe XD

Besides, our team created flowcharts to illustrate backend processes involved in the application, all shown in **Sections 6.1 – 6.3**.

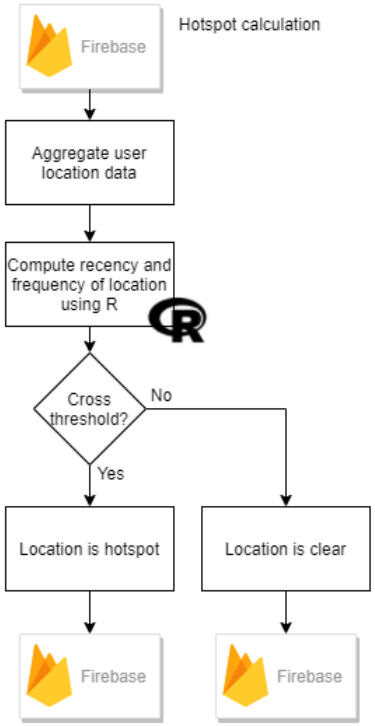
6.1 Server sync



6.2 Login



6.3 Hotspot calculation



References

Google (2020). *COVID-19 Information and Resources.* Retrieved from https://www.google.com/covid19/

Wikipedia (2020). *2020 coronavirus pandemic in Malaysia.* Retrieved from https://en.wikipedia.org/wiki/2020_coronavirus_pandemic_in_Malaysia