# U-TRACE

A COVID-19 Proximity-based Contact Tracing System

## What is U-Trace?

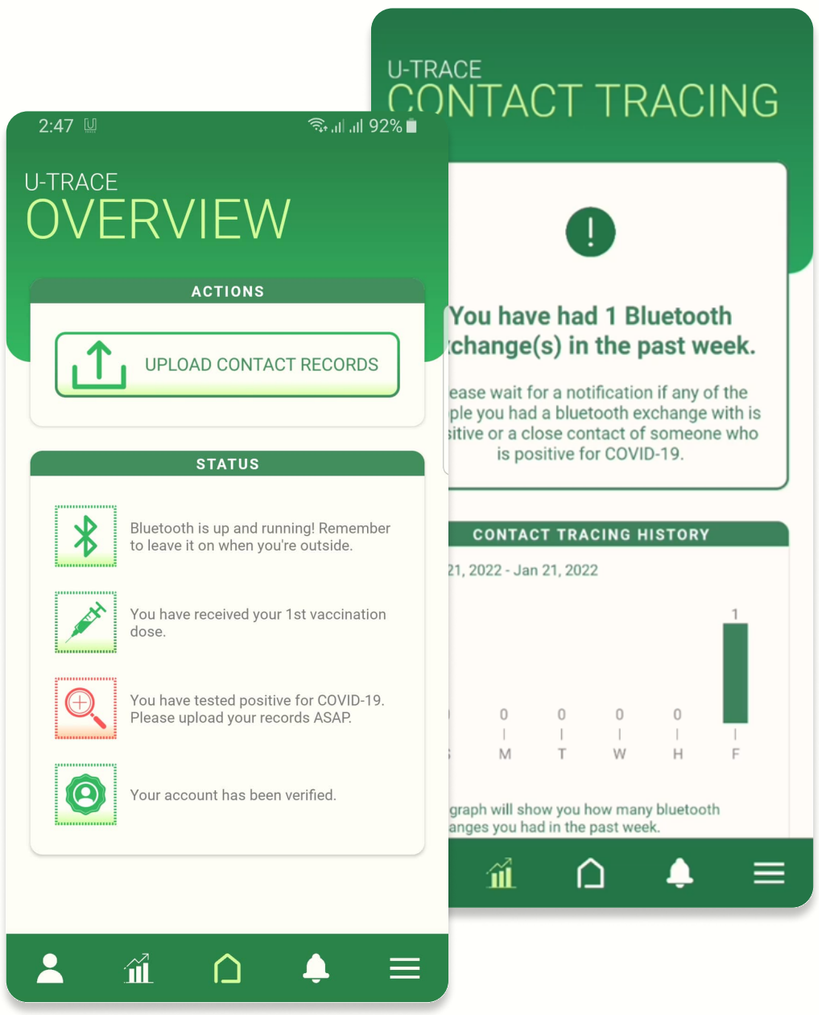
U-Trace is a proximity-based contact tracing system that makes use of Bluetooth Low Energy (BLE) technology to record individuals that have been in close contact. Proximity-based technology is used by the system to uphold the personal privacy of the would-be users of U-Trace, since proximity-based technologies do not reveal their geographical location but rather focuses on collecting information on those you've come near to. The system aims to introduce a new method of contact tracing which is centralized, efficient, and privacy preserving.

## What are the System Modules?

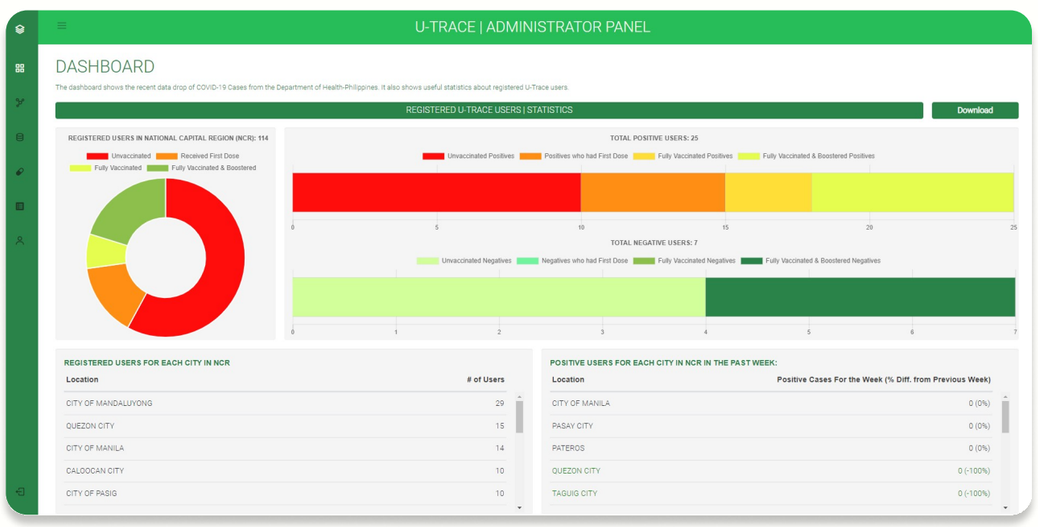
### (1) Mobile Application

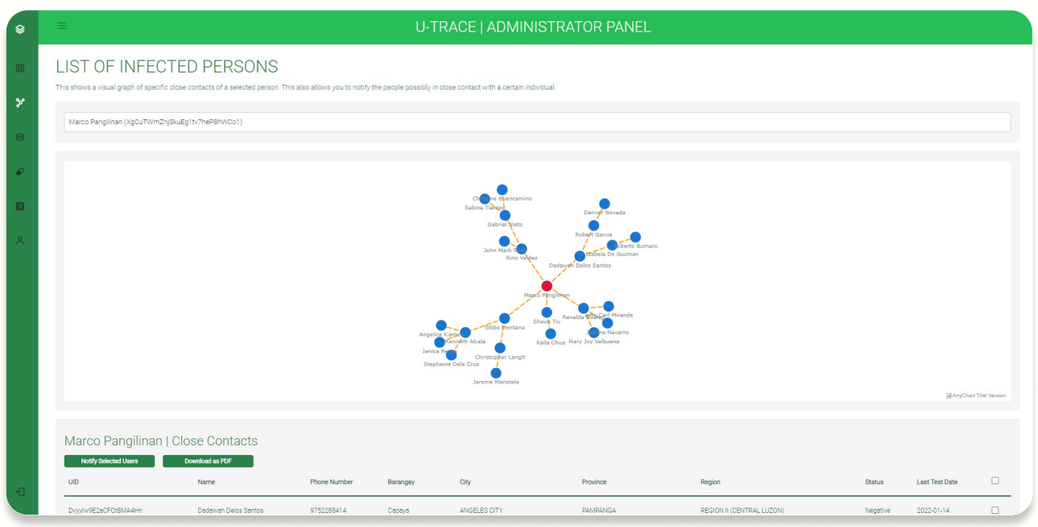
The mobile application is developed to be used on Android mobile devices and would require users to create an account in order to use the application. Personal information such as the full name, address, phone number, and email address will be collected from users once registering to the application. To comply with data privacy regulations, only the necessary information that will be used for the contact tracing system is collected from the users and no other details that are unrelated or not needed by the system will be asked from the users.

Unique identifier keys will be assigned to users as a means of identification and tracking. When two devices simultaneously running the application in the background are within a specified distance within each other, both will exchange their identifier keys instead of the actual account names. Keys collected from exchanges can be uploaded to a central database in order to perform contact tracing once an individual has been confirmed to be positive of COVID-19.




### (2) Administrative Information System Web Application




The backend administrative information system will be used by health authorities to monitor users and perform contact tracing. The system will be hosted using Firebase and a Firestore Database will be used for storing data collected from the mobile application. Administrators and health authorities will be able to access the database and other features of the system through a web application. Once the close contacts of a user confirmed positive of COVID-19 have been identified, administrators are able to notify them and provide the necessary guidelines for them to follow. COVID-19 test information as well as the vaccination status of users can also be updated by health authorities and monitor the number of users that were COVID-19 positive or check how many users have already been fully vaccinated.

## What is the System Architecture?

**Mobile Application**

**Web Application**