CONTAIMENT ZONE ALERTING APPLICATION

IDEATION

1) OBJECTIVES:

This application is intended to provide information about containment zones in a particular region by alerting people, through continuous monitoring of an individual's location. Key benefits of the application are monitoring people's activity and alerting them to their safety movements

SOLUTIONS:

The project aims at building an application that provides information about the containment zones of a particular region by continuously monitoring an individual's location. The location of the individual must be stored in the Database. Alerts are sent using the notification service.

Features of the Application

Admin App (portal):
They should have a login to app and update the containment zones locations in the portal.

Based on the location a Geofence will be created within a 100 meters radius. They should be able to see how many people are visiting that zone.

UserApp (Mobile App):
The app should have user registration and login. After the user logged into the app it will track the user location and update the database with the current location. If the user is visiting the containment zone he will get an alert notification.

2) Objective :

In a densely populated country like India, it is very difficult to prevent the community transmission even during lockdown without social awareness and precautionary measures taken by the people. Recently, several containment zones had been identified throughout the country and divided into red, orange and green zones, respectively. The red zones indicate the infection hotspots, orange zones denote some infection and green zones indicate an area with no infection.

Solution :

This Android application updates the locations of the areas in a Google map which are identified to be the containment zones. The application also notifies the users if they have entered a containment zone and uploads the user's IMEI number to the online database. To achieve all these functionalities, many tools, and APIs from Google like Firebase and Geofencing API are used in this application. Therefore, this application can be

used as a tool for creating further social awareness about the arising need of precautionary measures to be taken by the people of India.

3) Objective:

Our objective is to developing an android based application to identify the COVID-19 containment zone in India. We have used Geofencing and Firebase APIs (Application Program Interface) from Google as the base for development of this application.

Solution:

Geofencing is a tool from Android which is used to create virtual boundaries or fences around geographical locations. The developers can add geofences at different locations by providing the latitudes and longitudes along with radius to highlight the proximity of the location. Geofencing technology senses the user's current location and checks whether that location belongs to the set of pre-identified geofences. After creating the geofences, each geofence has the permission to get information from the location services of Google about entering, dwelling and exit events triggered by the users of the application when they enter or exit the geofence. Upon receiving a trigger event, the geofences can be programmed to

notify the user about the information of the location they have entered or exited. These geofences can be useful in preventing its users from trespassing inside the targeted locations.

4) Objective:

The Android application shows the location of the containment zones to the users. It also notifies the user when he or she trespasses the boundary of a containment zone or stays in the containment zones. All these functionalities are achieved by the help of Firebase and Geofencing tools from Google.

Solution:

A real-time database is created in Google Cloud Firestore which contains all the data related to the containment zones like latitudes, longitude, radius and zone names. Cloud Firestore features a NoSQL, document-oriented database (Firebase Cloud Firestore). There are no tables or rows. Instead, the location data are stored in documents, which are organized into collections. All the containment zones are stored in a collection in which each containment zone is represented as an individual document. Each document has four fields namely “Lat”, “Long”, “location Name” and “radius” for storing latitudes, longitudes, location names and radius, respectively. document-oriented Cloud

Firestore database with data of few containment zones. The “radius” field in each document is used to indicate the radius of the containment zone. The names of the fields must match the JAVA objects created in the Android application in order to properly extract each data from the database correctly. The Cloud firestore is connected to the android application by registering the SHA-1 (Secure Hash Algorithm 1) certificate fingerprint of the application in the Firebase project settings. After the database is connected, the location data of the containment zones can be retrieved by the Android application and can be shown in Google map. The latitude and longitudes of the geofencing area and a radius to determine the boundary is required for creating each geofences. The locations of the containment zones along with the user’s current location are shown using Google maps in the Android application. For testing the application, the GPS (Global Positioning System) signal of the android device has been mocked and set inside a confinement zone.