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MEDICAL EMERGENCY APPLICATION

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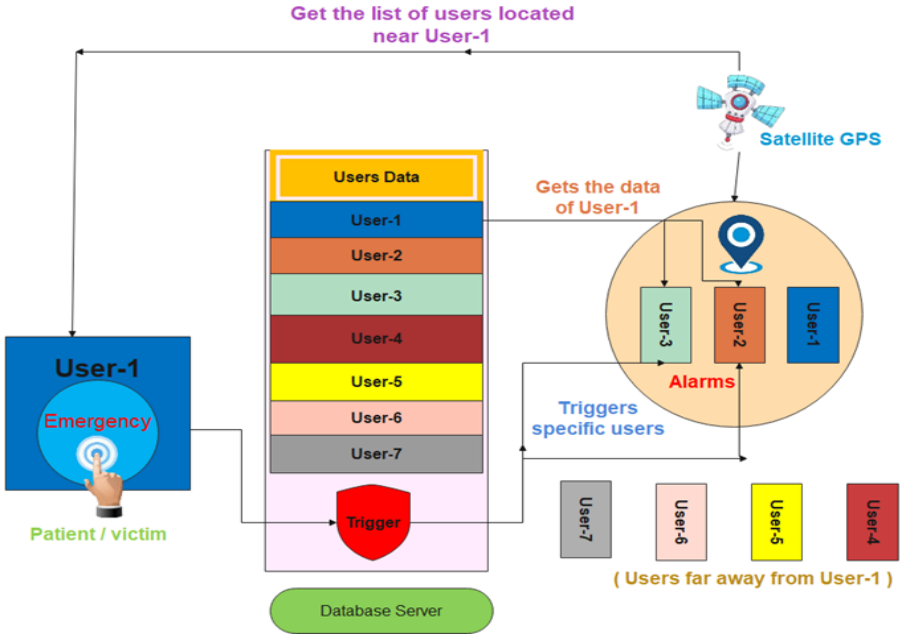
ABSTRACT: The rate of people who died because of late admission to the Medical Centre is 24 percent. In the forthcoming years, this particular percentage would increase rapidly. And hence, these stats become the vital aim to design an application to help/treat people who are under emergency conditions. So, we tend to provide a feature which fetch first aid/treatment faster than ever. Hence, the main feature that we implemented in our app is providing help with one press. On pressing, it begins to track and locate all the nearby users and fetch help. Hence to achieve our aim we started developing an application using ANDROID STUDIO. Then we decided to code the back-end programming using JAVA language.

KEYWORDS: Medical Centre, first aid, JAVA, Android Studio, Firebase database server, Doctors

ARCHITECTURAL DIAGRAMATIC REPRESENTATION:



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***Abstract*-- The rate of people who died because of late admission to the medical center is 24 percent. In the forthcoming years, this particular percentage would increase rapidly. And hence, these stats become the vital aim to design an application to help/treat people who are under emergency conditions. So, we tend to provide a feature which fetch first aid/treatment faster than ever. Hence, the main feature that we implemented in our app is providing help with one press. On pressing, it begins to track and locate all the nearby users and fetch help. Hence to achieve our aim we started developing an application using ANDROID STUDIO. Then we decided to code the back-end programming using JAVA language.**

Keywords-- Medical center, first aid, JAVA, Android Studio, Firebase database server, Doctors

I. INTRODUCTION:

Today, almost **90%** of population have mobile devices in their palms for communication. Instead of websites, mobile apps are trending nowadays. It is the Era of technology and when it comes to medical and health care, the medical professionals are required to take quick decisions and implement them timely in order to save lives. There are some emergency situations like a heart attack where the person must need an immediate medication, so there must be a mechanism to medicate the person as soon as we can. [1]

Like searching for the people nearby to his/her location, this concept is implemented in our app like when a person sends an alert request, our app first searches and gives the request to the nearby doctors, first aiders those who are available in the determined (say, 2000-m) range. Hence by this feature we can medicate the persons immediately. So, we decided to implement this feature in our application and we named it, ***MEDIQUICK***. With our app it is easy to give facilities and features to the users like quick interaction with doctors, to treat the user or getting help from the first aiders or normal users under any emergency situations. [2]

In Section II and Section III Literature review and methodology are presented respectively. We discussed about mathematical model and results on the Sections IV and V. And at the Section VI we have proposed all the additional features added in our project. And Section VII concludes our work. Successively, the remaining Sections display about the references, appendix and then the code of our project.

II. LITERATURE REVIEW:

Advantages	***Disadvantages***
ICE MEDICAL STANDARD APP: This application allows you to input your vital statistics (such as blood type, allergies). Even if you're unconscious, first responders and emergency personnel will be able to access your vital medical data as long as your phone remains operational.	The app doesn't support large storage of data and makes it respond slowly in the emergency case. Can only be used to alert the provided contacts, not the people who are nearer to the user.
PRACTO MOBILE APP: It has simple UI. You can select a particular specialty of a doctor and describe your ailment among the 22 cities of India. You can then have a one-on-one call or chat with the doctor. You have to pay for the consultation fees.	The application allows the users themselves to select the particular specialty, it doesn't guide the unschooled people in a correct manner. Also, this app is not useful in case of emergency and other serious issues. If you are from remote area, video call service is not up to the mark
DOXTRO MOBILE APP: This app offers instant doctor consultation and you can also schedule calls based on your preference. You have the option of getting diagnostics at home along with your medicines being delivered at your doorsteps as well.	This app is not very useful in case of emergency and other serious issues because you need to call and consult which is a time taking process.

Fig. 1. Literature Review Table

III. PROPOSED METHODOLOGY:

a. Description

On long pressing the alert button, the app begins to track and locate nearby registered doctors or first aiders and as well as normal users within the particular range, say 2000-m. After locating, an alarm will be ringed to users present in the tracked area. Live location of the person under emergency will be shared to everyone who accepts the alarm. At last, the person will be given proper medication by the doctors or first aiders with the help of the tools kept handy. The GPS must be enabled all the time while using our application, since it must run on the background of the OS. The app must work on the background to ensure that the Location of the particular user will be kept updated for every 600-secs.

b. Conceptual diagram

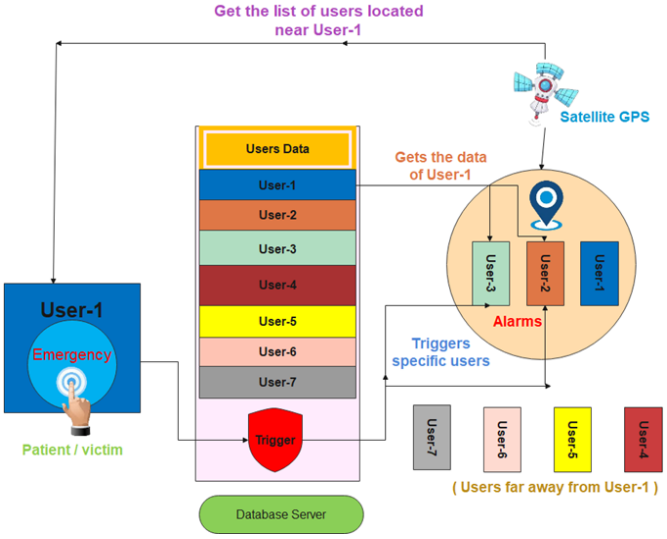

Fig. 2. Conceptual Diagram

IV. MATHEMATICAL MODEL

The formula used for Calculating the Distance between two Latitude and Longitude points. [6]

a. Haversine Formula:

$$a = \sin^2(\Delta\varphi/2) + \cos\varphi 1 * \cos\varphi 2 * \sin^2(\Delta\lambda/2) \quad (1)$$

$$c = 2 * \text{asin}(\sqrt{a}) \quad (2)$$

$$d = \mathbf{R} * c \quad (3)$$

φ is latitude, Δφ=difference between the 2 latitude points

λ is longitude, Δλ=difference between the 2 longitude points.

R is earth's radius (mean radius = $6.371*10^6$-m)

b. Implementation Of the Above Formula with Java Code:

```
public static double distance (double lat1, double lat2, double lon1, double lon2)

  {

    lon1 = Math.toRadians(lon1);

    lon2 = Math.toRadians(lon2);

    lat1 = Math.toRadians(lat1);

    lat2 = Math.toRadians(lat2);



    double dlon = lon2 - lon1;

    double dlat = lat2 - lat1;

    double a = Math.pow(Math.sin(dlat / 2), 2) + Math.cos(lat1) * Math.cos(lat2) * Math.pow(Math.sin(dlon / 2),2);

    double c = 2 * Math.asin(Math.sqrt(a));

    double r = 6371;



    return(c*r*1000); // in meters

  }
```

When latitude and longitude of two users are given then this formula is used to find the distance between them in meters.

V. FEATURES ADDED

1. Chat features between the victim and the persons who accepted the alert.
2. First aid tips have been attached at the top of the interface
3. Edit option has been included to edit your personal details
4. The application sends an automatically generated message to the specified phone numbers

VI. RESULTS OBTAINED:

a. Discussion on obtained results

- We successfully implemented the feature to find the live location of all the users nearby within the range.
- Then all those who accepted to help the person in emergency will be displayed to the user who clicked the alert button.
- All the accepted users can check the live location of the person in emergency so that they can help them.
- And if the victim fetched help or if alerted mistakenly, he/she can cancel the alert and this will be displayed to all the accepted persons which is very helpful because it will avoid all the unnecessary confusions.
- Hence, we successfully obtained a mobile application to help a person who is under emergency and requires sudden medication/treatment or even some help incase like to shift them to the hospital.

b. Comparison With Existing Systems

i. ICE MEDICAL EMERGENCY APP

There is an app named ICE in play store which works on this topic but it lacks some serious features like it only shows the details that you have given in your profile on the lock screen notification. This app doesn't have any emergency detection factor and of course it will not contact anyone in case of emergency. But in our app the location of person in emergency will be shared with all the nearby users. [5]

ii. PRACTO MOBILE APP

The next app that is related to our field is, Practo app which shows only the pre-given location of doctor clinics not the live location. This application doesn't help the people who are in emergency instead that it allows the users just to chat with the specialized doctors through audio or video. Instead, our app is available in all villages and cities, which comes in handy to help the people in case of sudden emergency. All you need is only Internet connection and it alerts nearby doctors along with your location and so you do not want to hesitate about the availability of doctors.[3]

iii. DOXTRO APP

At next, the Doxtro app which is also similar to the Practo app, it provides scheduling calls with doctors and home delivery of medicines and it has a chat option with doctors. But we cannot interact with doctor and doctor cannot examine properly through calls and this app cannot be used in emergency conditions. Because we cannot schedule calls under emergency. On the other hand, our application provides a feature to undergo the emergency situation with a quick treatment with the doctors or even normal peoples nearby. This helps us to save life of many people who encounter immediate death under some serious situations. [4]

iv. OTHER SYSTEMS:

Apart from this there are many websites which provide medicines but none of them can be used in case of emergency. And there are no other apps which have the feature to provide live location to the people nearby which is very helpful.

VII. CONCLUSION:

Almost 90% of population have mobile phones. There is an app for almost everything. But there is no app to help the people in emergency in a much faster way. So, we (Our Teammates) created an app in order to serve the people in emergency in any situation. Our App is designed and Optimized in such a way app will run in a faster way to help the needful. By implementing a simple UI, alerts sent by the injured people are sent to nearby doctor or first aider and as well as normal people within a range, latency of the app is low (say 2 seconds), live location are shared to everyone who accepted the alert, location being shared are updated for every 10 minutes. Hence, our app will help the needful in any emergency situations which are the prime objectives to create this app.

"Anyone can dream up great ideas, but an idea is nothing until it's realized, be it as a website, a physical product, an app, or a user interface."

-Jens Martin Skibsted

VIII. REFERENCES:

[1] ***https://indianexpress.com/article/cities/mumbai/now-an-app-to-provide-emergency-health-care-connect-people-with-nearest-hospital/***

[2] Reference for the Firebase Database

https://console.firebase.google.com/

[3] Reference for Prato Mobile app

https://www.practo.com/

[4] Reference for Doxtro mobile application

https://dextroinc.com/offerings.html

[5] Top Five Mobile apps that connects Patients to the Doctors virtually.

https://www.androidauthority.com/best-emergency-apps-android-841589/

[6] Reference for our Application

https://www.movable-type.co.uk/scripts/latlong.html

[7] ***https://indianexpress.com/article/cities/mumbai/now-an-app-to-provide-emergency-health-care-connect-people-with-nearest-hospital/***

[8] Image Source for the Application's UI.

https://www.freepik.com/

IX. APPENDIX A:

Here we attach the procedures to install and work on our application that is provided as an apk file:

Step-1:
Download the apk file of our application

Step-2:
Install the downloaded apk file and open it.

Step-3:

SNAPSHOTS ON LOCATION SETTINGS

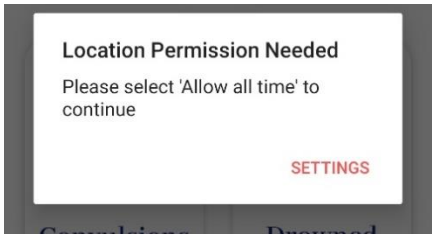

Fig. 3. LOCATION PERMISSION 1

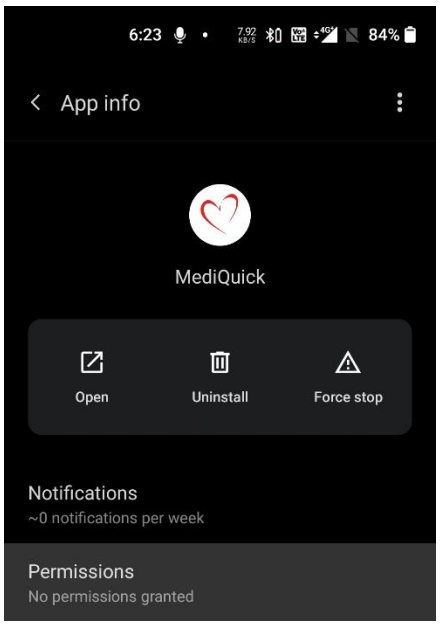

Fig. 3. LOCATION PERMISSION 2

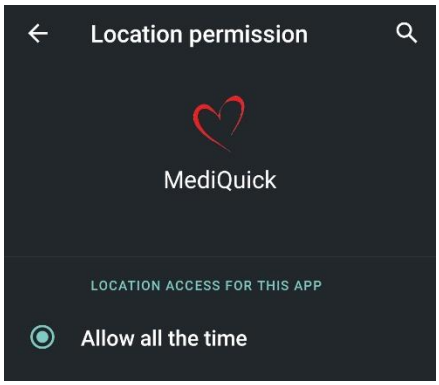

Fig. 3. LOCATION PERMISSION 3

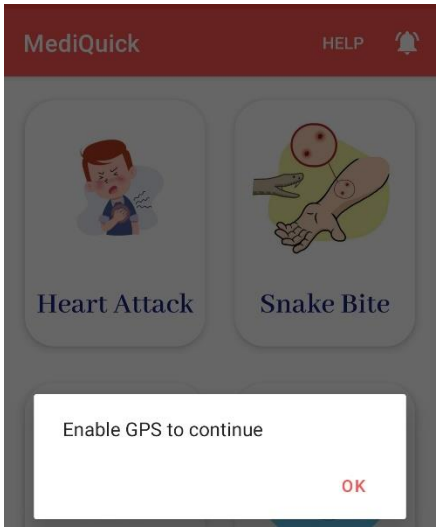

Fig. 3. LOCATION PERMISSION 4

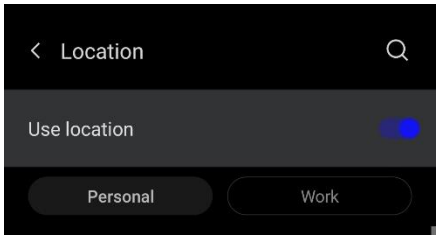

Fig. 3. LOCATION PERMISSION 5

After opening the application, the users will be asked to enable the GPS Location settings

If you are using Android 9 or below, then you need to select the setting ‘allow while using the application’

Incase if you are using Android 10 or above, then it is necessary that the users must select the setting ‘allow all the time’, to ensure that our application must be working on the background of the user’s mobile.

If you need more information on how our application's features work, check the help section of our mobile app.

SNAPSHOT OF OUR APP'S GUI:

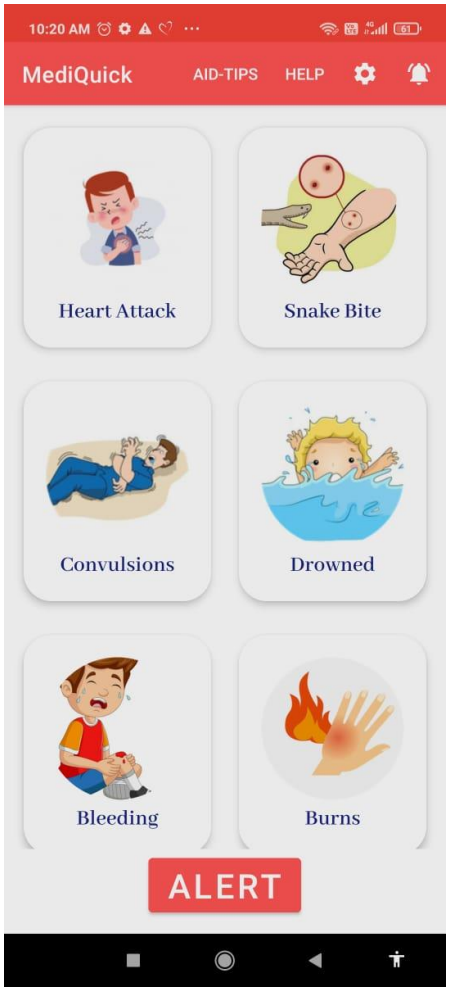

Figure 4 GUI

SNAPSHOTS ON ADDED FEATURES:

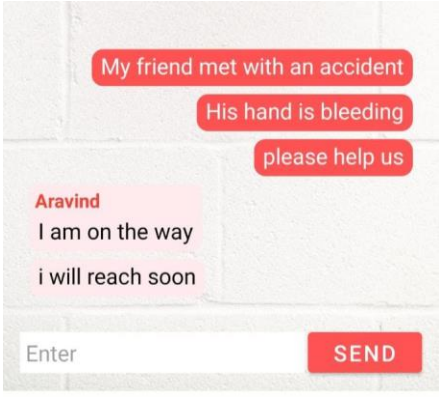

Figure 5 Chat feature

Figure 6 First Aid Tips

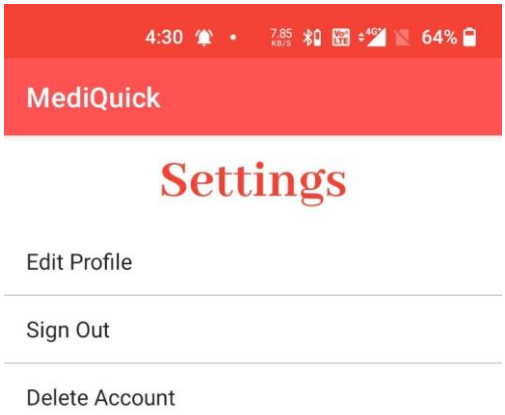

Figure 7 Settings Menu

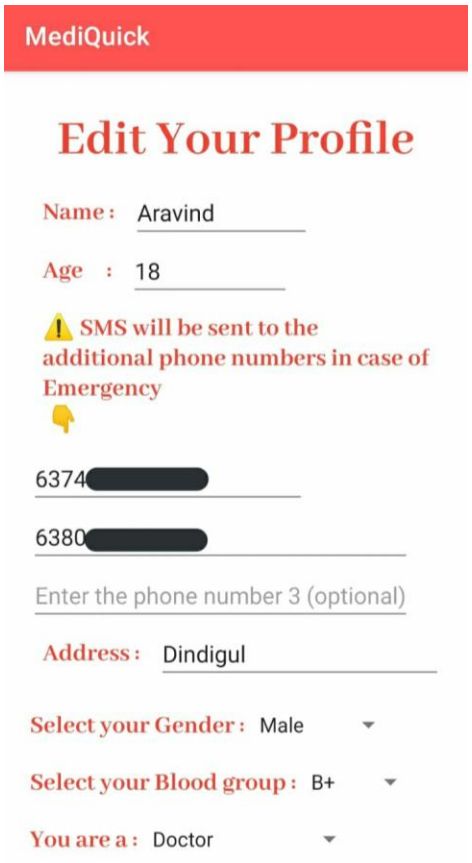

Figure 8 Edit option

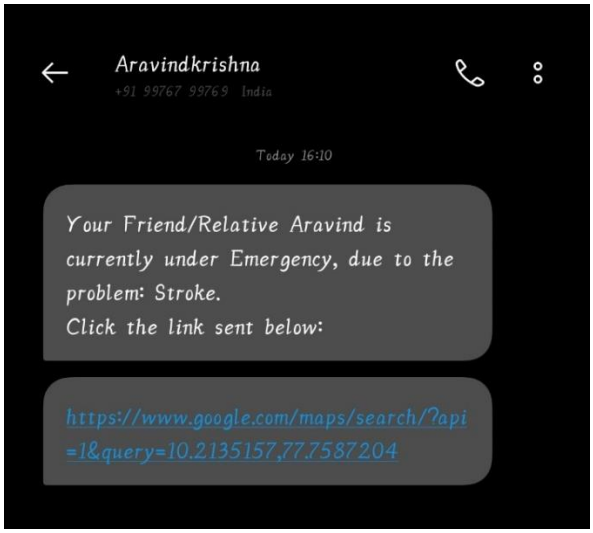

Figure 9 Alert Message

IX. COMPLETE CODE OF OUR APPLICATION:

We have implemented our application using Android Studio with the help of JAVA, XML and Realtime Firebase Database. Hereby we have attached the google drive link of the complete code needed to implement the application.

Drive link for our code:

https://drive.google.com/drive/folders/1MdF0K0miqWvm2u6ePV3tUaj6QnRepmZP?usp=sharing

Drive link for our application:

https://drive.google.com/drive/folders/1j0BU4PdlwWTS5EqPh3vYrMsIcB4BrX9y?usp=sharing