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Review on Indirect Emergency HealthCare

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Abstract: Indirect Emergency HealthCare is a mobile application which is developed in Android using multiple technologies and platforms. This project mainly provides the communication between Ambulance and various devices such as people on the roads or in the route of the ambulance Traffic Signal, and Computers in Hospital. This application also uses to book the ambulance and can make a call depending upon the situation. The user application (informer) can track the ambulance location through GPS at the same time people on the upcoming route of ambulance can get the alert message and alarm like a siren on their smartphones before 0.5 kilometers to make a path clear so that ambulance can get the fastest route to save the life of the patient.
Keywords: Android, Mobile Application, Firebase Cloud Messaging (FCM), Ambulance, GPS.

I. INTRODUCTION

During this pandemic period staying alive is the ultimate goal. The recent condition of covid-19 in India ambulance services are not only picking patients an emergency but also they are doing funerals as people are restricted due to infection. There are many emergencies where people are heavily affected due to accidents, weather conditions and various kinds of diseases. The main role of an ambulance is to reach at the accident spot or people in an emergency as quickly as possible and provide temporary first–aid at the spot and transport the patient to the appropriate hospital. In this situation, an ambulance serves the best work. But due to traffic conditions in urban areas, their services get affected and can cause harm to the patient. To recover this situation a dedicated service called "Indirect Emergency HealthCare" is a mobile application developed in Android to connect the nearby ambulance along with the hospital from their location. The IEH (Indirect Emergency HealthCare)can offer a bundle of solutions such as information availability, fastest route, post accidental action, reduce extra driving, interactive mapping, and message alert before an ambulance arrived on the particular route using GPS. This system will help the people in emergency conditions as there are many accidents happening on roads and highways due to harsh driving, patients suffering corona, and pregnant ladies. The idea behind this project is, many times ambulance got stuck in the heavy traffic jam as 1-2 km long on roads and it may take many hours to clear it and sometimes ambulance is unable to reach at an appropriate time so this application generates an alarm automatically to users who are traveling on the ambulance upcoming route.

II. LITERATURE REVIEW

GPS technology has become a big part of modern life, to keep track of ambulance activity and location improves safety and efficiency. The key technology used in this application is geolocation. Geolocation uses Google location API for identification of device location using the core-location framework and provides direction to the driver with the help of Google Maps API which gives navigation from point A to point B. Many articles proposed traffic controlling and vehicle tracking systems with different features. Implementing Intelligent Traffic Control System for Congestion Control, Ambulance Clearance and Stolen Vehicle Detection[1]. In this article, the RFID is attached with each vehicle with RFID tag, RFID reader, NSK EDK-125-TTL, and PIC16F877A system-on-chip to read the RFID tags attached to the vehicle. It counts the number of vehicles that passes on a particular path during a specified duration. It also determines the network congestion, and hence the green light duration for that path. If the RFID-tag-read belongs to the stolen vehicle, then a message is sent using GSM SIM300 to the police control room. In addition, when an ambulance is approaching the junction, it will communicate to the traffic controller in the junction to turn ON the green light. This module uses ZigBee modules on CC2500 and PIC16F877A system-on-chip for wireless communications between the ambulance and traffic controller.

Real-Time Tracking Management System Using GPS,GPRS and Google Earth[2].In this article, they have proposed a GPS tracking system that is composed of commodity hardware, open-source software and an easy to manage user interface via, web server with Google Maps via Google Earth software. The system includes GPS and GPRS module for location acquisition and message transmission, MMC to temporarily store location information and an 8bit AVR microcontroller.

RFID and GPS based Automatic Lane Clearance System for Ambulance [3]. In this article, they have proposed an RFID and GPS based Automatic Lane Clearance System for Ambulance. The focus of this paper is to reduce the delay in the arrival of the ambulance to the hospital by automatically clearing the lane in which ambulance is traveling, before it reaches the traffic signal.

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This can be achieved by turning the traffic signal, in the path of the ambulance, to green when the ambulance is at a certain distance from the traffic junction. The use of RFID distinguishes between emergency and non-emergency cases, thus preventing unnecessary traffic congestion. The communication between the ambulance and the traffic signal post is done through transceivers and GPS. The system is fully automated and thus, requires no human intervention at the traffic junctions.

Design and Implementation of Web-Based GPS-GPRS Vehicle Tracking System[4].In this article, they have designed an integrated web-based GPS-GPRS vehicle tracking system that enables enterprise owners to view the present and past positions recorded of the target vehicle on Google Map through purpose designed web site. The current position of the vehicle was acquired by GPS device which is integrated in the target vehicle and the location coordinates are sent through GPRS service provided by the GSM network. The GPS data are sent using Get method of HTTP protocol, the data at the server side are stored in database tables and can be retrieved as a request for position browsing on the map. A web application is developed using PHP, JavaScript, Ajax, XML, and MySQL with embedded Google Map to retrieve and display on track details.

III. PROPOSED WORK

IEH system works on real-time service providing a platform that matches the drivers (Ambulance) location to users(informers) location and users located in the public area through geolocation using mobile phones, so we need

1) Ambulance Service
2) User Service

Ambulance service tracks ambulance using geolocation (latitude, longitude) and User service tracks the GPS location of an ambulance when requested. The IEH also tries to help patients for hospitalization if incase of accidents that they can inform specific hospital before patient arrives so they can take necessary steps for treatment.

A. Works Flow
1) Step 1: Create a request to book an ambulance with the end destination of the hospital
2) Step 2: Verification of the request and user confirms the data and pickup location
3) Step 3: Matching up with the nearby available ambulance. The driver accepts the request
4) Step 4: The driver accepts the request. The status of the driver is set to busy and the system starts sending alert messages automatically to users, computer administrators of the hospital, toll and traffic junction.
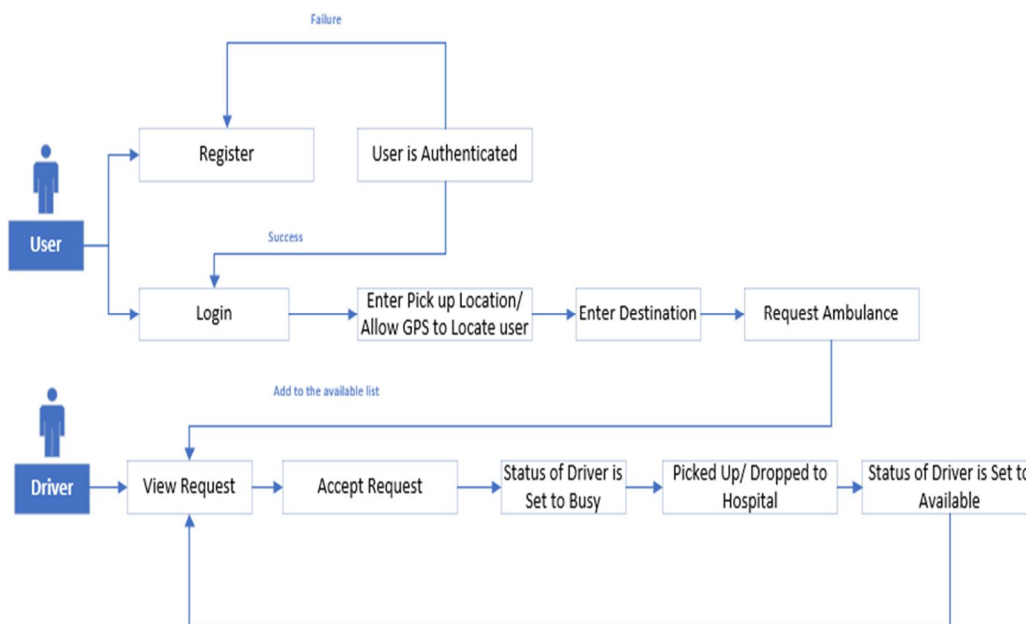

Fig.1. Use case Diagram for Indirect Emergency Healthcare

B. Useful Technologies and Platform

1) GPS (Global Positioning System): In this project, GPS provides interactive mapping for users and drivers that they can track each other's location. Interactive mapping uses Global Information System (GIS) to show pinpoint locations on the map. Global Positioning System is a satellite-based radio navigation system. It is one of the global navigation satellite system (GNSS) that provides geo-location and time information to a GPS receiver anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites [5]. It provides the information of exact location. It can also use to track vehicles or people. Using geolocation technology, communication is setup between the smartphones, which come with GPS as a stock feature and the satellite. It establishes a seamless interaction funnel between the two devices, gathering location (latitude, longitude) data at different instants of time.

2) Firebase Cloud Messaging (FCM): Firebase Cloud Messaging is a cross-platform messaging solution that reliably delivers messages at no cost. FCM is a cloud service designed to power real-time, collaborative applications. By simply adding the firebase library to the application, it gives an access to the shared data structure, any changes made in data are automatically synchronized with the firebase cloud and with the user application within milliseconds. For use cases such as instant messaging, a message can transfer a payload of up to 4KB to a client app [6].

IV. CONCLUSION

As ambulance services are incredibly important to the citizens of India so using this application we can make it more safe and efficient to work. The purpose of this project is to provide the fastest and smoothest path for the ambulance so that the injured person can get treatment at golden hours. In this application GPS (Global Positioning Services) is implemented to avoid the traffic blockage in the route of the ambulance so it reaches the destination smoothly. This application automatically sends the message by blowing an alert sound (siren) on their smartphones using geolocation. Hence, this application gives a solution for the emergency vehicle without any interruption.

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