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A Wireless Framework for Emergency Health Care System

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Abstract: With the advancement of mobile application and technology for wireless network, the wireless infrastructures are used further for the progress of health care application. This technological progresses bring the emergency medical care system anyplace at any time. In this paper, we propose a GPS based framework for tracking and providing the ambulance services with minimal delay. Based on different real time constraint such as local traffic, shortest path and user defined parameters etc., our system ensure that the patient will be able to get the ambulance as early as possible. This application also provides information about the nearby hospital and doctors facilities which in turn helps the patient to get the treatment as early as possible.
Keywords: GPS, Optimal Path, delay, WSN etc.

I. INTRODUCTION

HEALTHCARE means maintainance and improvement of health and components of healthcare are prevention, diagonosis, treatment of disease and other physical and mental impairments in human beings and these steps can be fulfilled by good hospitals and experienced doctors only and we have to take patient to those hospitals to treat them but what will happen to them who stays alone at home or to those people who are aged and suddenly they are feeling uneasy? The crucial part of this phenomenon is taking them to hospitals by ambulances.

In order to keep up with the needs of current times, many ambulances throughout the world are making use of GPS tracking systems to offer better services. Functional upgrades such as these allow optimum dispatching of ambulances which in turn helps to ensure prompt execution of emergency medical services that allow timely patient transport.

II. PROPOSED SYSTEM

As the basis of our project "HEALTH CARE MONITORING SYSTEM"
We proposed an automated version of manual system,named as " QUICK CARE"
It is basically an ambulance tracking app. Side by side it will also provide-

A. Storing all neccessarynecessary information about patient,
B. Gives details of nearby health center,
C. Disease details to the patient
D.   Book ambulances.
E. Emergency call service if ambulance is not available nearby the location
F. Calculating shortest path to reach destination.

It will also help to ensure primary treatment even when a patient is in an ambulance. So that by following the advice of the hospital, ambulance crew can deliver primary care or even reroute the ambulance vehicle to the nearest healthcare center with the available specialists. By having access to all necessary patient data, the experts at the hospital can deliver proper treatment as the ambulance brings in the patient.

III. WORKING PRINCIPLE

We use android studio to develop the application. Firstly, the app has two parts.one for user and the other one is for ambulance driver. For user this app has an optional registration & login page. So that user can directly search for nearby ambulances & book them in case of emergency skipping login registration. Registering themselves or creating a login ID allows them to save their medical records to make them handy whenever needed. User can check for the nearby available hospitals also. And a driver can login using their login ID password provided by admin to manage bookings and track the booking address.

Not only this but this app will also check for congestion of road and find out optimal path i.e. which path will take the minimum time to reach nearby hospitals.

Besides this we use restful API in our app for more efficient use. In this picture we show how our app will work with a flow diagram.
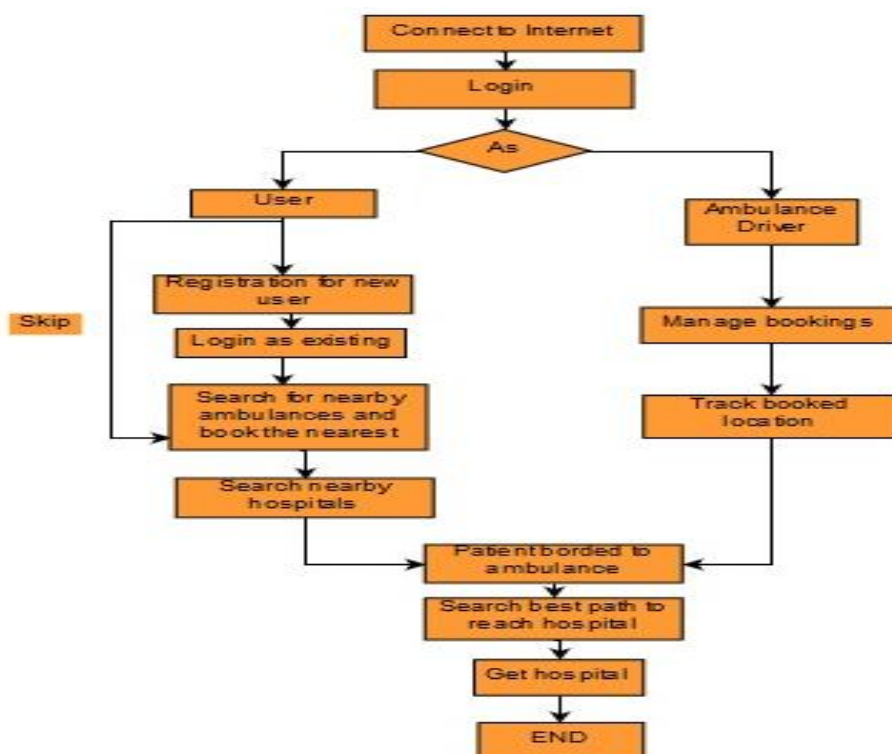

Fig.1: Flow Diagram of proposed application

IV. ARCHITECTURE

As we said before we use here Android Studio 3.0. java for building class files and UML for layout design. For storing data, we here use MongoDB. Reasons to use Mongo DB over firebase and MySQL is it is a no SQL database, flexible, can store lots of data, less expensive, and more secure than firebase and MySQL.

We use restful API for efficiency. It is a service that is being offered by one electronic device to help communicating with each other via the WWW (World Wide Web). In web service the web technology used to make it better to communicates HTTP, it is designed in such a way to help in better communication between human & machine or between machines, more specifically for transferring machine readable file format such as XML &JSON

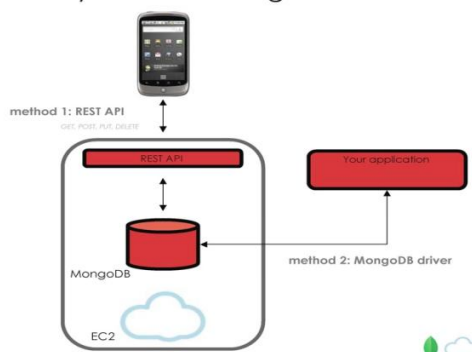Following picture describes the architecture of our application.

Fig.2: Architecture of application

V.   OPTIMAL PATH FIND

This is the one newer feature in this proposed application. Traffic is the major problem these days and it creates more problem to ambulances to reach the destination in time. Implementation of intelligent traffic control is needed but besides that what is more important is finding optimal path in which traffic is less and reaching to hospital or patient's home will be minimum. That mean the application will have the google map's feature. For this we use GOOGLE's distance matrix API. We can access it through HTTP interface with requests constructed as a URL string, using origins and destination, along with API key.
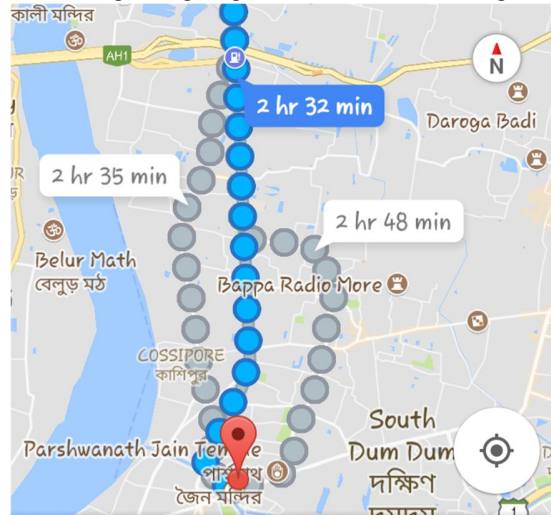

Fig.3: optimal path & time find in map

VI.   CONCLUSION

The proposed GPS based Ambulance tracking system can provide immediate action against the medical emergency and able to discover end to end shortest congestion free route to find out the nearest hospital or health centre with minimum delay. This application also provides information about the nearby hospital and doctors facilities which in turn helps the patient to get the treatment as early as possible. All the available navigation system can discover the shortest path and point out the possible traffic. But any available system can't recognize the "one way traffic." In future we want to modify our application to address the problem of one way traffic.

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