

## **“EMERGENCY MEDICAL HELP SYSTEM USING OSM”**

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**Abstract:** With the growing social pressure, most people are facing health problems, especially a lot of high-level personnel problems and road accidents occur frequently. As mobile phones play more and more important role for people, it is the best choice that the system will be deployed on mobile phones. Mobile phones support Internet access, so when the user is not feeling well, he can log in the system, their status will be sent to the server. It observed that people in unknown area are in severe danger if they don't able to find hospital quickly. In emergency case a single minute counts so it is very important that applications must be used for decision making, maintain up to date status of the hospital. Saving the time which can be save life of the patient. We have proposed a location based emergency medical assistance system using OpenStreetMap (OSM) the healthcare centers or the nearest Hospitals are mapped by taking the waypoints of them. Our proposed system comprises a database as central server of the detail information about Hospitals. Android device with application installed on it and its user. The application shows the markers of healthcare centers on the map along with audio information for visually impaired people and as per user

requirements he/she chooses the nearest hospital and gets direction from current place to selected hospital using OpenStreetMap. So our main aim is to develop android application taking "Medical Emergency" into mind.

*Index Terms:* Location based service (LBS), Location Based Medical Assistance (LBMA), Emergency Medical Service, Android, Tracking, and OpenStreetMap

### **INTRODUCTION**

According to the World Health Organization, approximately 30000 people die in road accidents every year while millions are injured or disabled each year. According to the research conducted by the Chief Researcher at the Abu Dhabi Department of Economic Development, Abu Dhabi, the capital city, alone saw 116,487 vehicle crashes in 2009. In addition, the Department noted that including both direct financial measurable objective cost and the indirect socio-physical cost, the accident cost in the UAE from 2009-2011 was about AED 17 billion which is equivalent to about US \$4.6 billion. According to the research results, the Arab region has been classified as the most prone to car accidents, including the UAE, and especially Abu Dhabi. Despite

having the proper response team, the problem arises in locating the accident.



Figure 1: Road Accident

The National Ambulance Company (NAC) of Abu Dhabi has 34 standby ambulances and 10 mobile hospitals ready to be dispatched. The NAC has maintained an excellent record of an 86% success rate on responding to an accident within 10 minutes; however, conditions like not finding the location due to the failure of the caller to give exact address affect the response time. The smartphone to be used for verification/diagnosis purposes by the police/ambulance. Location-based services for healthcare have become possible with the development of GPS and telecommunication technology since it meets the requirement of healthcare system

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## RELATED WORK

Till today a good number of works have been conducted in locationBased services domain for addressing various problems. Healthcare location based services has become possible with the development of telecommunication technology. In [4], S. H. Chew et al. described a location based patient tracking system which is based on global positioning technique. However, authors described it is at initial stage of the development. I. Maglogiannis et al. [5] proposed EmerLoc, which is also implemented on GPS technology. Their background describes that this system requires some sensors, a monitoring unit micro computing unit as well as a micro computing unit. As it needs sensors and some hardware elements for proper coordination so it is not affordable everywhere. However, our system requires only a smartphone with our application installed on it which is affordable in our country. P. Keikhosrokiani et al. [6] proposed location based mobile cardiac telemedicine system (LMCES). Dijkstra's algorithm is applied for selecting the shortest path between the nearest healthcare unit and the patient location in order to facilitate the ambulance's path under critical conditions. But it must be ensured that medical amenities are mapped before its implementation. Limitation of the work is that this system will work only for cardiac patients. Recently, a work has been done to map healthcare centers in our country and an android application based system has been proposed to provide the emergency medical assistance [7] which has also used OSM for mapping. Also in [8], [9] two wireless

telemedicine systems are described. Here it is focused on addressing different problem instead of healthcare location based services. Oehlman et al. [10] focused on location based services and different mobile mapping APIs. They also looked at methods about how to render map on mobile using these APIs. They delved deeper into APIs of Google map which has some restrictions for public use. However, they did not describe on any API for open source map e.g. OSM which we have used in our system. Rifat et al. [11] proposed location information system for helping both normal and visually impaired people to search a specific location with text message. Nevertheless, this system can not give audio direction to get to the destination if the user takes wrong path. They also proposed that user gets an advertisement list based on current location via GPS with the assistance of location based advertisement (LBA) [12] using OSM. Rahman et al. [13] proposed an early disaster warning and evacuation system using OSM. It provides automatic visual and audio disaster warning to the user of the system if he is in probable disaster zone. Still it cannot give the complete solution for post disaster recovery and relief distribution help. In the country like Bangladesh, the demand of location based services is increasing with the growth of smartphone technology. However the digital map of the country to support location based applications on smartphones is not rich. So the challenges and opportunities of OSM in various sectors are discussed in [15]

## PROPOSED SYSTEM

### SYSTEM ARCHITECTURE

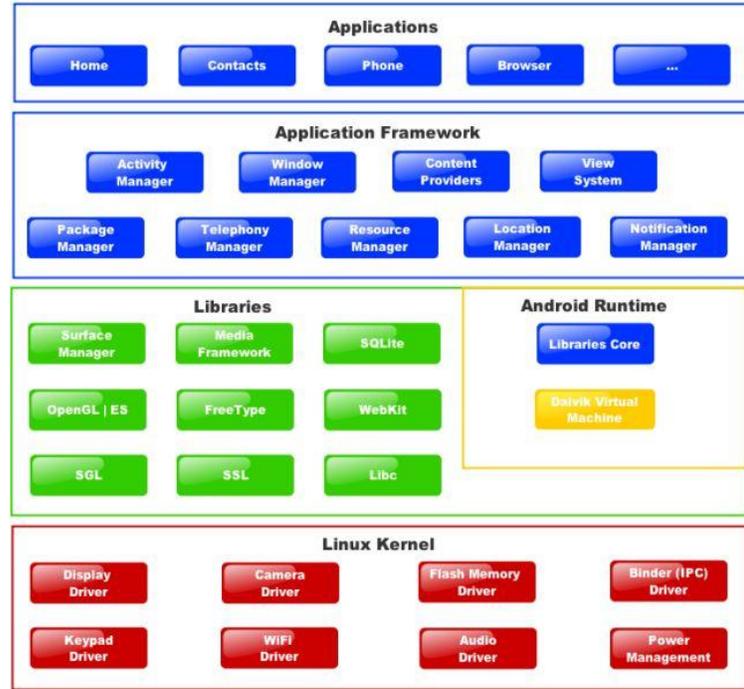


Figure 2: Android Architecture showing the major components of Android OS (Android Wiki, 2015)

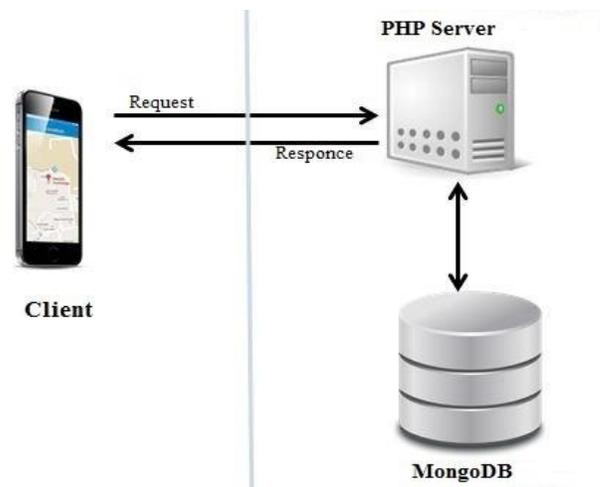


Figure 3: Connection between PHP (server) and Android (client) using HTTP and JSON

The architecture shown in above **Figure 3** is used to show the list of hospitals, store the hospital details, user profiles and alarm details. The data from android goes to webserver (PHP) to database server (MongoDB). PHP is used here because of the interaction it can offer with the databases. On Android, HTTP protocol is used to connect with the webserver (PHP). JSON (JavaScript Object Notation) is a lightweight text-based open standard designed for human-readable data interchange and it is used in this application to send data from Android device to PHP Script. When the application is executed, it connects the device to the PHP Script on the server. PHP Script fetches the response data which is encoded to JSON format and then sent back to the device. The data is parsed and displayed according to the requirement.

**ACTIVITY DIAGRAM**

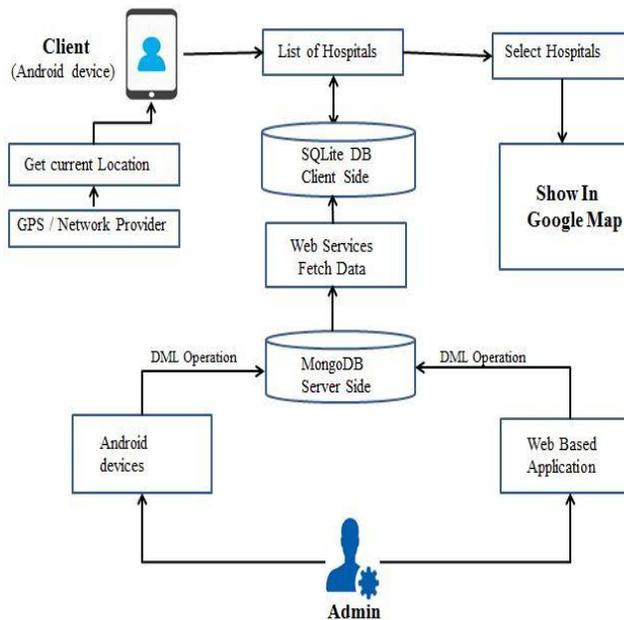


Figure 4: Hospital Finder Activity

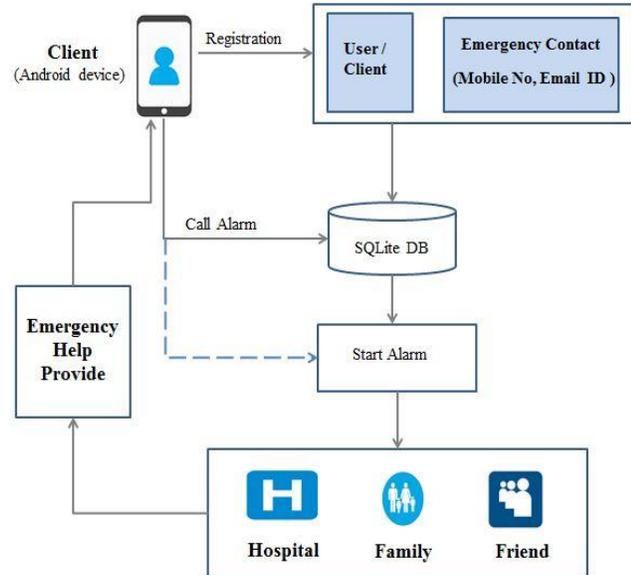


Figure 5: Emergency Alarm Activity

**CONCLUSION**

In our project we are developing a user friendly android application for getting the help in emergency situation for a needy person. When user stuck in any accidental situation or when android user is alone & nobody is present with it then, by using our application it is possible to get the help from its friends/family members immediately which contact user saved as emergency contact. And user is able to get location of nearest hospital/healthcare clinic by using our application with accurate path & distance.

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