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E-Emergency Medical Service Management System Using Android

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ABSTRACT: Medical OPD (Out Patient Department) Services application will assist in finding and reserving the ambulance, identifying the local hospitals and pharmacies, identifying the blood-bank and blood donors, and indicating first-aid measures to be observed. The programme offers hospitals and application users with an ambulance tracking system. The ambulance driver may send an alert message to the traffic control centre to clear traffic in the event of an emergency, and he can also send an alert message to the hospital to prepare for the patient's health condition in advance.

KEYWORDS: OPD; First-Aid; Ambulance; Hospitals; Patient

I. INTRODUCTION

OPD refers to the Outpatient Department of a hospital. It is the section of the hospital where patients receive medical consultations and other allied services, such as ambulance services and emergency medical services, which treat illnesses and injuries requiring an immediate medical response, providing out-of-hospital treatment and transport to the hospital. Injuries, infections, obstetric difficulties, and chemical imbalances may all have rapid effects on the body or mind, resulting in medical emergencies.

To treat these illnesses, emergency medical services (EMS) involve prompt evaluation, timely provision of relevant treatments, and adequate transportation to the closest suitable health institution using the most effective techniques to improve survival and avoid impairment.

The objective of Medical OPD Services is to give urgent medical treatment to everyone who needs it. In recent years, advances in medical treatment and technology have widened the boundaries of what was formerly the traditional realm of emergency services. Not only are these services restricted to hospital care, but they also extend from arrival through stabilisation. Also included in Emergency Services are pre-hospital care and transportation.

Advantages

- Application helps the ambulance driver in finding more accurate location of the user.
- Application can help user to reduce time complexity.
- Application helps in finding the nearby Hospitals and Pharmacy.
- It also helps user to know whether the Hospital or Pharmacy is Open/Closed.

Motivation

The telephone conversation is time-consuming, specific information are not recorded, and misunderstanding may occur on occasion while utilising the telephone.

Proposed System

The following characteristics of the emergency medical system (EMS) serve to compensate for deficiencies in the present system.

The patient will employ an Android application with built-in GPS technology to communicate coordinates and user information to the ambulance driver's mobile, which will be loaded on every ambulance's device, allowing them to

quickly identify and approach the user. The hospital will be able to follow the position of the ambulance and also get an alert message from the ambulance, allowing them to plan ahead for emergency situations.

II. RELATED WORK

For an in-depth understanding of the present issue, it is necessary to do research into a variety of resources to demonstrate the dependability of the existing system. Here, we shall examine the problem statement and supporting arguments.

➤ Emergency Medical Service (EMS)

Emergency medical service (EMS) is a service responsible for leading the department in delivering well planned and coordinated emergency management resources that can react to public crises whenever necessary. Due to the crowded and fast growth of urbanisation and concrete jungle in every region of the globe, the path to search and rescue for human refuge is very complicated. This shows the ambulance driver's ability to reach the emergency location on time. These difficulties demonstrate that the necessity and obligation of an EMS are necessary and equally important for saving lives, and that using and enhancing this system will enable the community to be safe and worry less about the authority's service.

➤ Remote Panic Button

When the user presses the "Help Button" once, the remote panic button sends an emergency signal to the monitoring system and displays a message notifying the user that the remote panic button has been activated. The controller will read the condition of the device and promptly send an SMS message to the emergency service. We may deduce from the article that a panic button can be used to send a signal or notice to an ambulance when the user is alone or unable to assist himself. This will assist them in requesting assistance requiring ambulance care. It saves time compared to dialling and requesting assistance, which might delay down the rescue operation.

➤ GPS and GIS for Ambulance

GPS stands for Global Positioning System is a satellite-based navigation system, the GPS Receiver retrieves the location information from satellite in the form of latitude and longitude real time reading. This system can be used to track real-time positions of a vehicle and smartphones which whenever the GPS setting is switched on GIS stands for Geographic Information System which is a software used for linking spatial and non-spatial data. Ambulance service in a congested area like Shah Alam, Kuala Lumpur and many major cities in Malaysia facing much constraints such as traffic lights, tolls, and devastating heavy trafficked roundabouts. If an inexperienced ambulance driver has taken a wrong route, the driver will result on late arrival on the emergency scene. GPS and GIS can be implemented on the ambulance to track their location by the system archive and utilize the service of track the user and find the best route to the user as fast as possible. Integrated GPS component in the vehicles and smartphones will be useful for this project which we will be utilizing the main function in our application.

III. PROPOSED ALGORITHM

A. Modules

3.1 Ambulance Module

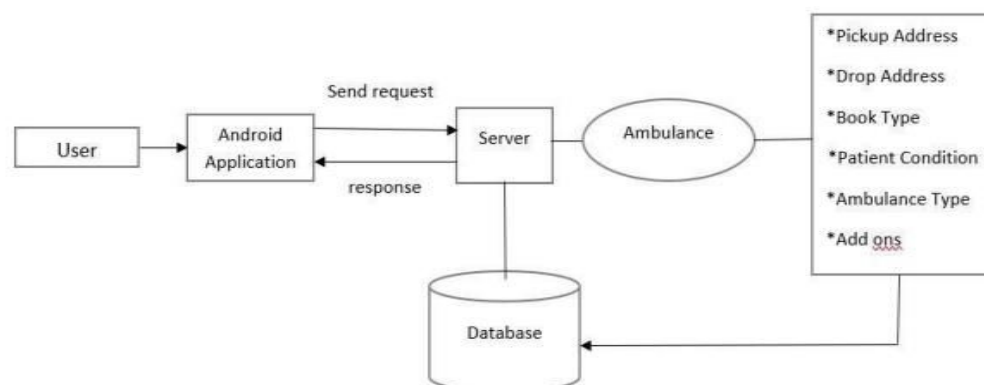


Figure 1: Ambulance Module

Figure 1 illustrate, on launching the application first device will automatically detect the location of user using the GPS devices. Later depending on the user's requirement/need user will choose option of finding nearby ambulances. Then the user will select the nearby Hospital i.e. the Drop location and also user select type of booking patient condition and type of ambulance based on emergency requirement. Smartphone application will read the data from response and plot the coordinates or information according to the user's request.

The system will be functioning as below:

- Sends notification to Ambulance Driver.
- The user's pickup and drop location along with the type of booking and add on information will be sent to ambulance driver.
- Cuts off waiting time.
- The user doesn't have to call and check for availability of the ambulance anymore.
- Ambulance will be able to track the location of the user with GPS.
- Notifications that sent by the user will provide the GPS location of the user and also provides the user's pre-registered address.
- Safe and reliable.
- Provides the user all the information of the ambulance that accepted to fetch user – Ambulance name, Driver's name, Ambulance number plate and Driver's phone number.

3.2 Hospital and Pharmacy Module

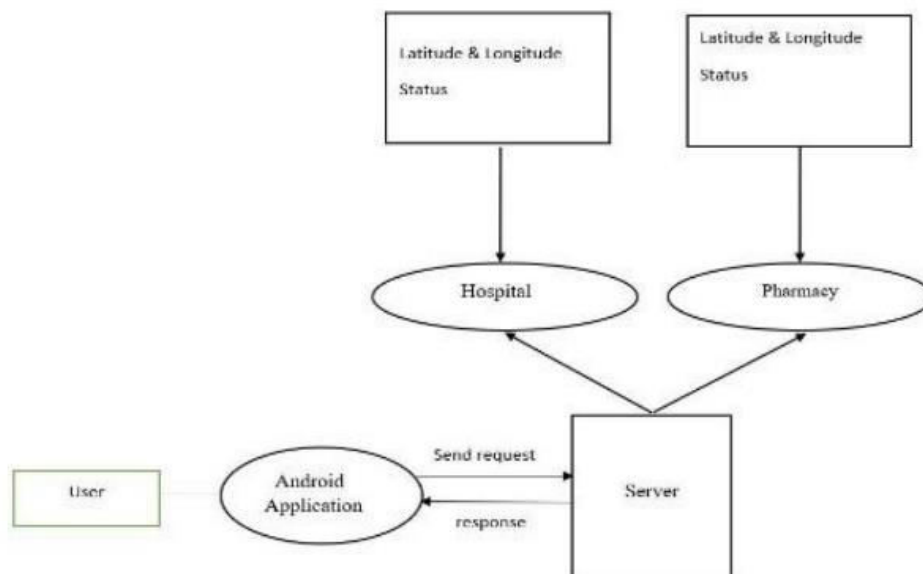


Figure 2: Hospital and Pharmacy Module

Figure 2 illustrate, on launching the application first device will automatically detect the location of user using the GPS devices. Later depending on the user location nearby Hospitals and Pharmacy are listed. The user can also check whether the Hospital or pharmacy is open or closed. If required the user can also request for the direction from their current location to required Hospitals or Pharmacy.

3.3 Find Blood Module

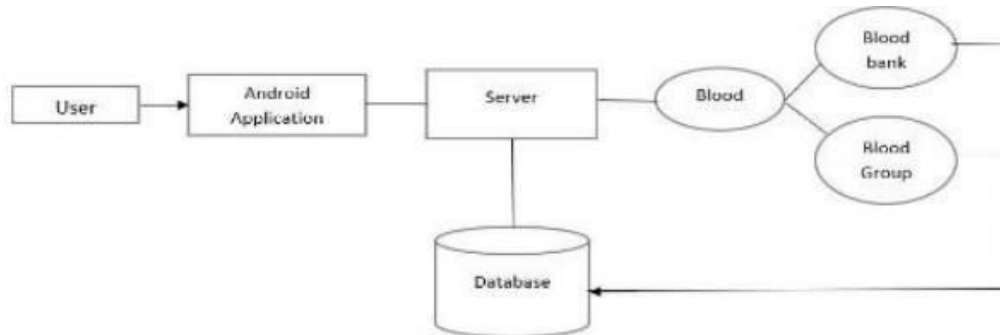


Figure 3:Find Blood Module

Figure 3 illustrate , on launching this module the user can search for the required blood group in the application database for donors, whether it is available or not. Otherwise the user can also search for the nearest blood bank based on his current location.

3.4 First Aid Module

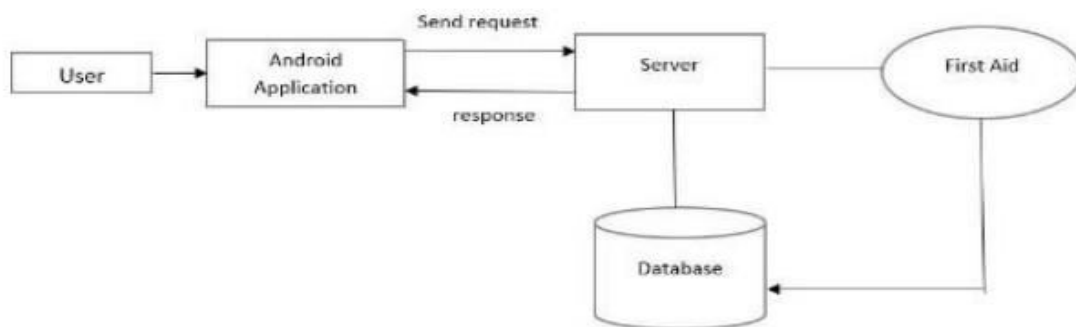


Figure 4: First-Aid Module

Figure 4 illustrate, on launching this module the user will get quick solutions or home remedies for minor injuries or health issues. Such as Burn, Allergies, Choking, Bleeding etc.

IV. SYSTEM ARCHITECTURE

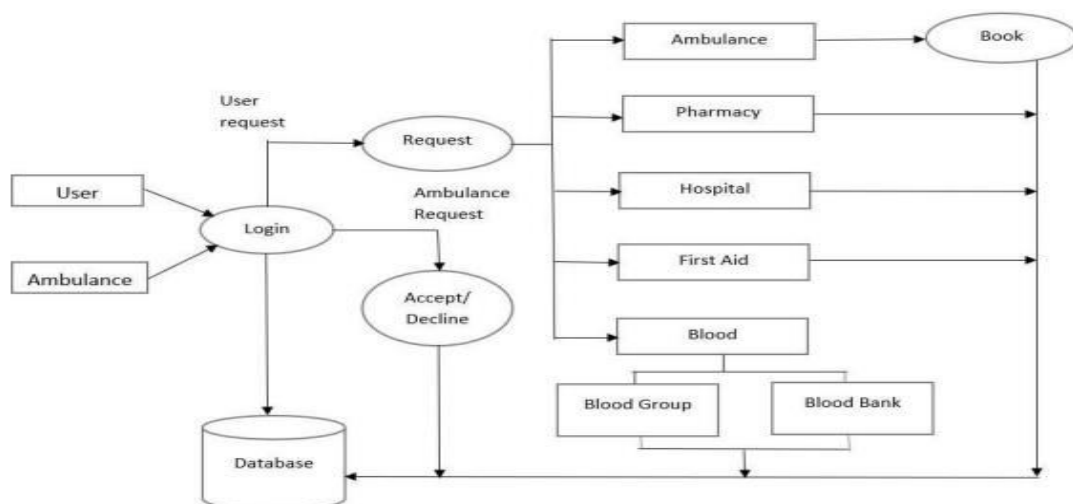


Figure 5: Overview of Medical OPD Services

Figure 5 shows the Overview of the Medical OPD service. At first, the users and the ambulance drivers enter the login credentials. These data are stored on a server for future use. If the login details are valid, the application displays the main screen for that particular role what the person who is using the application has chosen. The details provided by the user are shared with the ambulance driver. The details of the ambulance driver are shared with the users. After login process, the user can make a request for an ambulance nearer to his/her location. The ambulance driver can accept this request upon which he will be displayed a map showing directions to the user's location, then the Ambulance Driver will drive to the destination address. The travel history will be stored in the database.

V. EXPERIMENTAL RESULTS

The results are shown below:

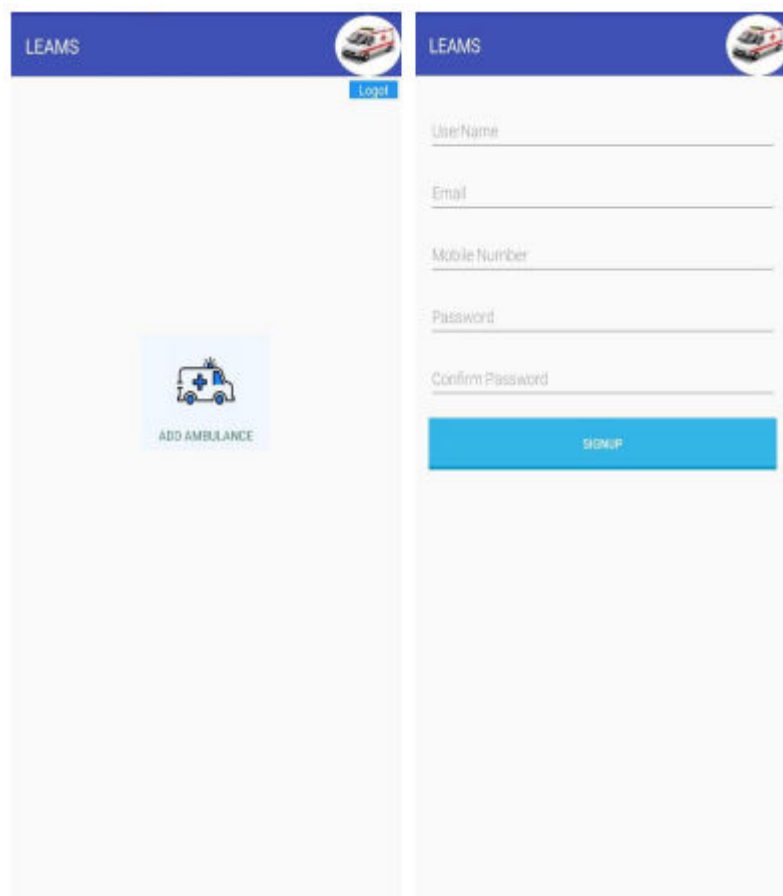


Figure 6: Admin Module **Figure 7:** Add Ambulance

The above figure 6 is the admin home page, where he can add new ambulance. The above figure 7 is the form page, where the ambulance driver's credentials are to be entered.

LEAMS	LEAMS
Davanageri Heart Hospital 9th Main Road, MCC B Block, MCC, Davanagere 3.3/5 MAP	Chethana Pharma #1634 8th Cross, Davanagere 4.5/5 MAP
City Central Hospital Akkamahadevi Road, 17, AVK College Road, Prince Jaysachamaraja Wodeyar, Davanagere 3.1/5 MAP	Apollo Pharmacy No 1480/3, BIET College road, Siddaveerappa Layout, Davanagere 4/5 MAP
Ashraya Hospital 1977/1-2, Shamatur Road, MCC A Block, Davanagere 3.3/5 MAP	MedPlus Anjineya Extension Near Anjineya Temple, 1st Main 1st Cross Road, Anjineya Extension, Anjineya Badavane, Davanagere 3/5 MAP
Latha Nursing Home AVK College Road, Prince Jaysachamaraja Wodeyar, Davanagere 3.4/5 MAP	MedPlus B I ET Road No 3308, 11, BIET Road, MCC B Block, Basavashree, Davanagere 4.4/5 MAP
City Medical Center Medical College Road, MCC B Block, MCC, Davanagere 3.4/5 MAP	MedPlus Vidya Nagar 3RD Busstop Opposite Shiva Parvathi Temple, D No 1660/14, Ward No 34 3rd Busstop, Opposite Shiva Parvathi Temple, Tanakabalu Extension, Ext, Vidyanagar, Davanagere 4.1/5 MAP
Sanjeevani Hospital MCC A Block, Davanagere 4/5 MAP	ANTAHKARANA CLINIC PHARMA 2nd Cross 8th Main MCC B Block Near Water Tank Park, Davanagere 5/5 MAP
Asthma Allergy Chest Centre Dr B Vidyasagar, #3452 2nd main 8th Cross Road, MCC B Block, Davanagere 3.3/5 MAP	MedPlus Hadadi Road No 623/4, Jayees Complex, Hadadi Road, Shrinivasa Nagar, Davanagere 5/5 MAP
Sukshema Hospital MCC B Block, MCC, Davanagere 4.1/5 MAP	Apollo Pharmacy No 658, Ward, near Supermarket, No 34, 2nd Main Road, Nijalingappa Layout, Davanagere 3.3/5 MAP
Bapuji Child Health Institute and Research Centre MCC B Block, MCC, Davanagere 4.2/5 MAP	MedPlus MCC A Block Davanagere High School, Near, No 2518, Ward No 28 Mmc A Block, Sakreshwar
Chigateri General Hospital HOSPITAL ROAD, Davanagere	

Figure 8: List of Hospitals

Figure 9: List of Pharmacy

The above figure 8 is the list of hospitals, listed down based on user's location. The above figure 9 is the list of pharmacy's, listed down based on user's location.



Figure 10: Find Blood



Figure 11: List of Blood Bank

The above figure 10 is the blood bank module, where user can search for types of blood groups and also blood banks. The above figure 11 is the list of nearby blood bank based on user's current location.

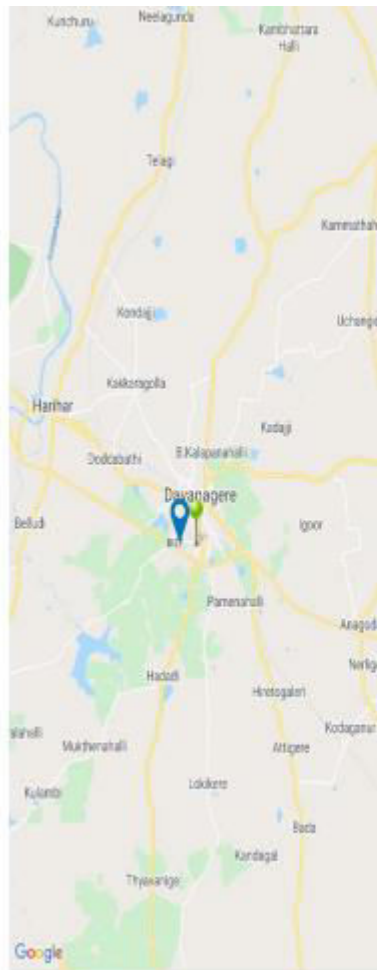


Figure 12: Listing of Ambulance

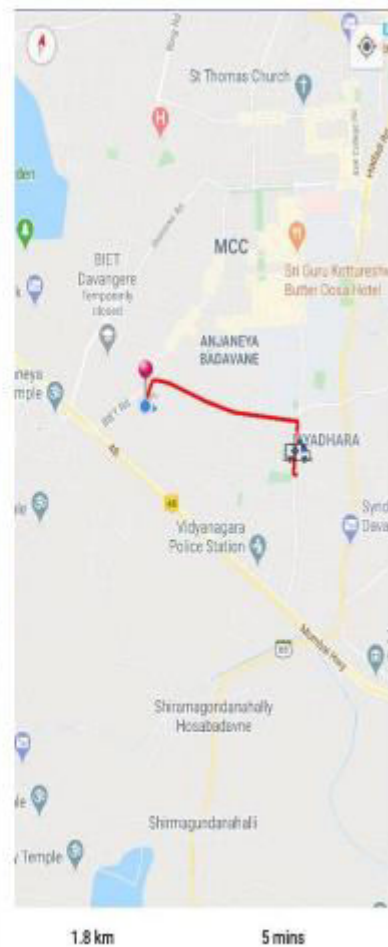


Figure 13: Tracking Page

The above figure 12 is the map, where the available ambulances are shown. The above figure 13 is the tracking page, where user can track the booked ambulance.

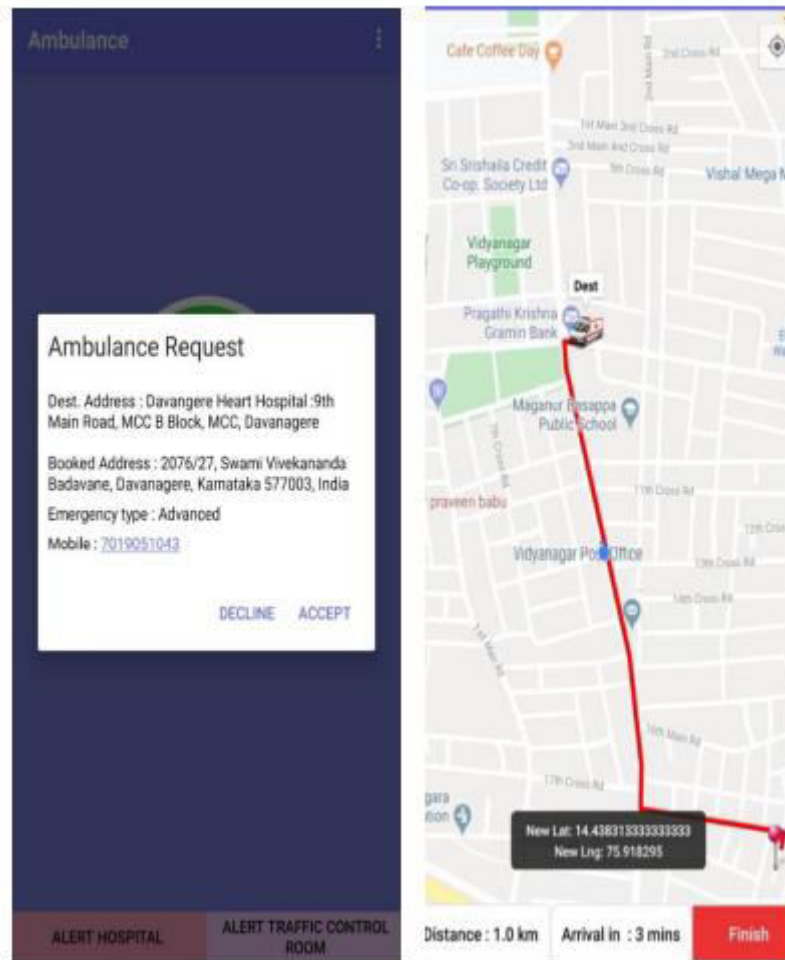


Figure 14:Request Ambulance Figure 15: Map to User's Location.

The above figure 14 is the pop up message received by ambulance driver, which contains pickup and drop location. The above figure 15 is the map shown to ambulance driver.

VI. CONCLUSION AND FUTURE WORK

An idea is proposed for saving a patient's life in a faster way possible. It is beneficial for users in case of emergencies as it saves time. With this Application, the ambulance can reach the patients, as location is given through the app and can provide necessary equipment required for the patient. Information about the pharmacy's provided helps in getting the appropriate pharmacy which is suitable for the patient's treatment.

The challenges people in the rural areas with respect to public health care facilities like medical emergency services. In particular, patients found it difficult if not impossible to access medical ambulance transport during emergency situations which consequently, leads to loss of lives that could be prevented. With such challenges and others, proposed a solution in the capacity of Mobile-based ambulance transportation system. It is aim at improving ambulance transportation availability and other services when requests are made without having to call or wait for long time. Project is designed and implemented a prototype to demonstrate the operation of the system to show its effectiveness with respect to the current systems. Based on its mode of operations, we believe that if adopted for used by people living in the rural areas, not only rural areas but areas where modern pharmacy or health facilities are not located. Moreover, it could go a long way to make their lives easier and prevents the loss of lives of thousands of people needing emergencies. [3]

Our future work will be to improve the system by incorporating technologies of Android application to scale it up and link it with all nearby hospital, pharmacy and blood banks such that if a service is not available in one, multiple hospital, pharmacy and blood banks that offer such service can be suggested immediately alongside its distance, arrival time and the availability of ambulance, hospital and so on to attend to the emergency situation.



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