

GPS Based Blood Organization and Healthcare System

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Abstract: -- Blood is the important fluid in human body. It saves the lives of people in emergency needs. Blood bank manages collection and distribution of blood to hospitals in emergencies. "GPS Based Blood Organization and Health-care system" is a GIS integrated, GPS Based service providing facility to timely update the information of donors, acceptor and patients. Proposed model is Web portal with android application for users. It also maintains the available amount of blood group and notifies donor to donate if blood stock is less than required amount of blood. With web portal, an android mobile application is designed to search the donors nearby available during the emergency cases such as accidents. As today, almost everyone carries mobile phone with them, android application is designed to attract large number of users in the system to form a network of donors, blood banks and hospitals. Registration on web portal is mandatory to access the service. GPS technology is used to trace the location and navigate to nearby hospitals, blood banks and blood camps. The user will be able to get the route to the desired location to save the time. The GPS based android application is efficient and adaptable to meet the need of blood banks and hospitals in emergencies. Hence the life at threat can be saved by using this m-technology in healthcare sector.

Index terms: GPS, Android, Web Application, Blood Bank.

I. INTRODUCTION

Hospitals and Blood Banks require blood in emergency cases. So, they need to search for blood donors nearby to save lives of patients. Existing system uses traditional desktop application services for blood management. In this Paper, we have proposed the idea of using m-technology to simplify this process. GPS technology is used in android application to develop Location based services. This project is the design and development of web service with mobile application using location services in device. Further, we include Geographic Information System- GIS in the mobile application where the data is transmitted between mobile application and web portal through wireless network. The mobile application is easy to use and will automatically generate the list of blood donors, hospitals and blood camps based on user location.

II. GPS AND GIS APPROACH

The proposed system is based on GPS Technology. The Global Positioning system[6] is the global navigation satellite system (GNSS). GPS uses satellites to send information to GPS receivers that are situated on the ground. This information helps people to determine their location. GPS Accuracy depends upon

many factors such as device, telephonic operator, internet connectivity. The US government created this system, maintains it, and makes it accessible to anyone freely with a GPS receiver. GIS stands for Geographical Information System. GIS is a software program that helps people use the GPS satellite collected information.

III. LITERATURE SURVEY

1. In The Optimization of Blood Donor Information and Management System[1] by Technopedia " authors proposed the solution for the problems such as wrong information of donors, misuse by third parties and updating the donated blood by the donor which replaces the older systems. the proposed system is integrated framework which has a cloud-based application on mobile devices. In this paper, proposed idea is an extended web application to timely update the information regarding the donors, acceptor and patients where the administrator access the whole information about blood bank management.

2. In Android Blood Bank[2] , Prof. Snigdha, Varsha Anabhavane, Pratiksha lokhande, Siddhi Kasar, Pranita More have proposed an efficient and reliable android blood bank application. The wireless internet technique discussed in the paper enables the flow of data to work more rapidly and conveniently. Blood bank

Application developed by them provides list of blood banks in user area.

3. "Blood Bank Management Information System in India[3]" paper gives informative study and review the main features, advantages and disadvantages of current desktop based blood management system in India. Authors also make comparative study of different online web portals and suggested some improvements to improve blood transfusion services.

4. In "Android Blood Donor Life Saving Application in Cloud Computing[4]" authors have proposed use of cloud computing in their paper for blood management. They have implemented RVD Model using RVD Scoring Algorithm. Here, authors proposed a project which aims to create a web application known as cloud application for android mobiles. The purpose of this project is development of system for linking of blood donors. The system will help to control a blood transfusion service and create a database to hold data on stocks of blood in each area as data on donors in each city.

5. The paper named "Implementation of Location based Services in Android using GPS and Web Services[5]" studies how android location API can be used to improve consumer services. They have also given Google Places API option for Location based services in their published paper. In this paper, authors propose the implementation of Location based services through Google Web Services and Walk Score Transit APIs on Android Phones to give multiple services to the user based on their Location.

IV. EXISTING SYSTEM

To understand the existing system of blood transfusion services, we visited Jankalyan Blood Bank[7] and some hospitals in Pune city. After study of working of blood bank, found some drawbacks and disadvantages of existing system. Proposed idea can be used to overcome these drawbacks.

Drawbacks of Existing System

1) No Proper Communication between Hospital and Blood Banks.

2) Users are unaware about blood camps organized in different parts of City.

3) Existing system is time consuming to obtain blood for patients.

V. PROPOSED SYSTEM

Working of Proposed System:

1) First of all the users (Acceptors/Donors), Blood Banks and Hospitals, Organizations are registered with our system on web portal. Registration is mandatory to access the service.

2) Organization (anyone who wants to organize blood camp at their location) sends request to blood bank for Camp Organization. Blood Bank Responds as "Yes" or "No". If the Response is positive blood camp is organized.

3) Whenever Camp is Organized, Blood Bank Maintain their stock details by updating its database every time.

4) At the same time, system also notify the registered users in the 15 km radius - blood camp details on their respective android devices using GCM notification. If a user wants to Donate blood he will also be able to navigate to respective blood camp using GPS navigation technology.

5) Whenever Blood is required in emergencies Acceptor/Patient search for required blood component for respected blood group. The system track the GPS location of that acceptor and displays the nearest blood bank/Hospital details to that acceptor.

6) Acceptor selects any of the one option by clicking. After clicking details of that blood bank/Hospital i.e. Address, contact no., Availability of blood is displayed with Show path option.

7) If user click on Show path, system will show the path from acceptor location to that blood bank/Hospital.

8) Our system sets a minimum threshold for all blood banks if any blood bank stock touches to that threshold our system sends warning message to that blood bank.

9) The system also Provides "View Availability of Blood at Blood Banks" Facility to Hospitals.

Mathematical Model

Let U be the Set of our System,

$$U = \{Acc, Dnr, BB, GPSloc, Hos, TSP\}$$

Where, Acc, Dnr, BB, GPSloc, Hos, TSP are the inputs of the set.

Acc = Acceptor

Dnr = Donor

BB = Blood Bank

GPSloc = GPS Location

Hos = Hospital

TSP = Traced Shortest Path

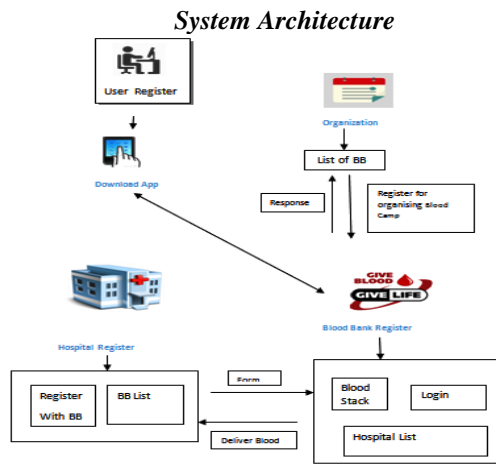


Figure 1: System Architecture

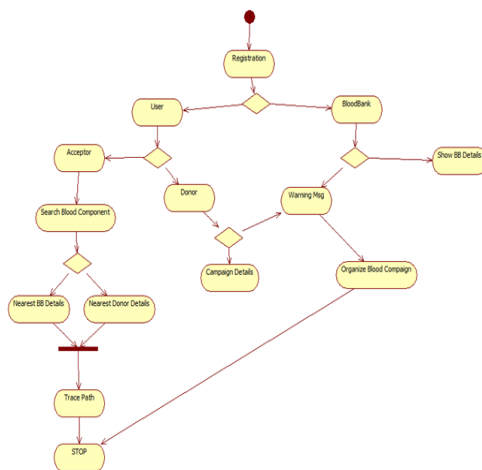


Figure 2: Flow Diagram

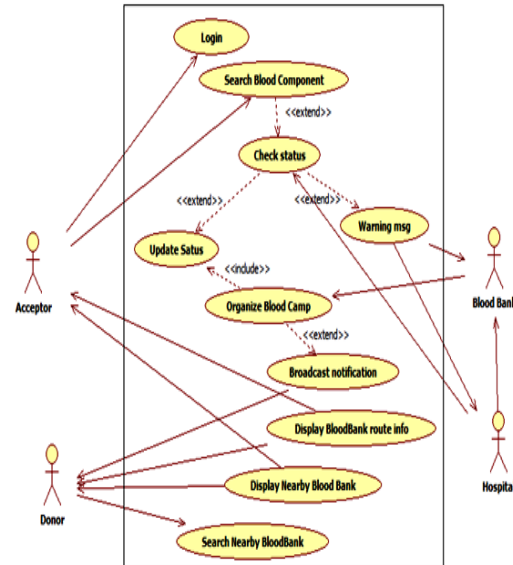


Figure 3: Use case Diagram

Features of Proposed System

- ◆ Connecting Users (Donors/Acceptors), Blood Banks, Hospitals, Organizer at one Platform.
- ◆ Blood camp management and Camp notification to registered users in the area using Google Cloud Messaging.
- ◆ Anyone can register and use the service.
- ◆ Location wise search and navigation to nearest hospital, blood bank, blood camp using mobile application.

VI. CONCLUSIONS AND FUTURE WORK

There is increasing use of m-technology in every sector of life with advancements in hardware and software. Everything is available at One touch on the Smartphone. So, This mobile technology is used for healthcare and blood distribution system in this paper. GPS is also available almost on every Smartphones. The GPS based proposed system is useful in emergencies to trace blood donors, hospitals which can save lives at threat. We have proposed an efficient and reliable online blood transfusion service based on GIS integrated in android mobile application. The

service provided by the proposed system is needed and valuable to Health-Care sector. The Future work of this system is to create application for windows based phone and i-phone to provide service to more users, Maintaining user privacy and security of system, create the huge online network of blood banks in the country.

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