

Computer Aided Emergency Service System

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Abstract -Blood Donation and Blood Transfusion Services (BTS) are crucial for saving people's lives. Blood banks suffer frequent shortage of blood; hence, advertisements are frequently seen on social networks urging healthy individuals to donate blood for patients who urgently require blood transfusion. The Computer Aided Emergency Service System (CAESS) is a web application which allows the user to search donors of specific blood group based on their location, in a short period of time. This system not only display the list of donors but also facilitated with tracking the location of the nearby donors and providing SMS alerts to them, so that the patient can be served with blood soon. If no nearby donors are found, the user can make use of the hyperlinks of other nearby blood banks, which helps the user to search donors. In order to donate blood through the portal, one has to register himself by providing all the required details. These details must be valid and true so that they can be tracked at the time of emergency. Once all the details are approved by the Admin, the donor will be added to the list of registered donors. GPS module is included in order to locate the donors. Thus, the CAESS is readily scalable, efficient and adaptable to meet the complex need of blood bank who is key facilitators for the healthcare sector. Also this system achieves high productivity when compared with other similar systems. Hence the life at threat can be saved quickly.

Index Terms – Blood donor search, computerized search for blood donors, Emergency System, GPS tracking, SMS notification.

I. INTRODUCTION

Giving blood saves lives. Emergency situations, such as accidents, create a critical need for specific blood type. In addition to emergency requirements, advances in medicine have increased the need for blood in many on-going treatments and elective surgeries. Despite increasing requirements for blood, only about 5% of the Indian population donates blood. In such situations, the patient or neighbor should call to the emergency service, blood bank, or they can even approach through acquaintances. They will enquire about their address and have to contact all the donors, no matter how far apart they are. This process will take time in reaching the patient, location on that time the patient may go any unstated situation. Hence, here arose the motivation to reduce this time for activating the emergency situation by providing a web service on any device such as Smartphone, PDA, etc. The Computer Aided Emergency Service System provides a moderate solution to this problem. The system is facilitated to provide blood service in a shorter period of time at emergency. Initially, the web portal consists of list of all donors. In case of emergency, the patient / his relation has to search for the donors of specific blood group. Once the list of all available donors are displayed, the server then displays the refined list of donors who are nearer to the patient's location. These donors are alerted through SMS about the blood request, so that they will be able to get prepared to donate blood.

II. PROBLEM DEFINITION

The higher the number of accidents, the greater the need for blood. There are many checks for the manual search as it takes too many steps and also time consuming.

- It takes time for a donor to reach an emergency location.
- It increases stress as the initial steps are little tedious at that time.
- Patient's state is not absolutely prepared until the arrival of the right donor.

The "COMPUTER AIDED EMERGENCY SYSTEM" is to provide blood service in a shorter period of time, which will help the patient (blood requestor) to be get treated better at the case of an emergency. This system is implemented by using GPS location tracking in order to search the nearest donors located in and around the location of the patient so that the blood can be donated on time to serve as well as save the patient. As soon as the location of the donors are tracked, they will be alerted through SMS Gateway, so that they will be prepared to donate blood. Some of the enhanced features of the Computer Aided Emergency system are as follows

- “CAESS” is a system designed to overcome the problems in the existing system.
- It is all triggered with a single click web application that sends the latitude and longitude position of the donors location.
- Blood from nearby donors are utilized efficiently.

III. FIELD STUDY

This system has been proposed with respect to some other similar systems. They are described briefly as follows.

“Abhijeet Bhadane”, “A cost effective GPS-GPRS based women tracking and safety system using android mobile” focus on women safety. Women Safety Application can be used to find and Help Women in emergency. In recent time it’s been identified lots of misbehaving activity in urban and rural part of our country. With the rapid growth of Android user and cheaper internet cost the system can provide a simple medium to create safety awareness among the working and professional women of young and teen age. Women safety Application can shows the exact location of the women in help to her relatives, guardian and friends along with the specific location, where one can go and help it.

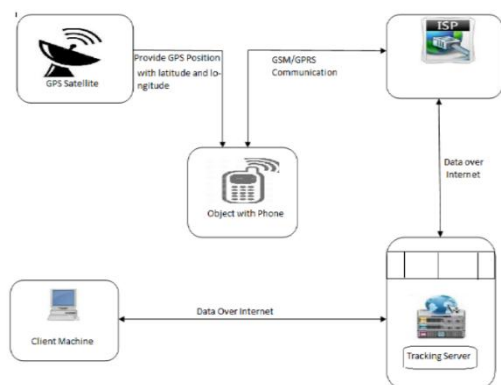


Fig 1. Architecture of Women Tracking System

Women safety Application system offers the added protection of being track by relative son different time interval and different location. In the addition to the family, parents can easily track and monitor her daughter. Women safety Application as every girls have mobile phones and rarely put them down. Thus the system proposes a low cost women tracking system using GPS and GPRS of GSM network, suitable for wide range of applications all over the world. It is expected that the full implementation of the proposed system would ultimately replace the traditional and costly SMS based tracking systems [1].

“T.Hilda Jenipha, R.Backiyalakshmi”, “Android Blood Donor Life Saving Application in Cloud Computing” is

proposed to handle emergency situations. The sole purpose of this project is to develop a computer system that will link all donors. The system will help 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 [2].

“Khondker Shajadul Hasan, Mashiur Rahman, Abul L.Haque, M Abdur Rahman, Tanzil Rahman and M Mahbubur Rasheed”, “Cost effective GPS-GPRS based object tracking system” proposes and implements a low cost object tracking system using GPS and GPRS. The system allows a user to view the present and the past positions recorded of a target object on Google Map through the internet [3].



Fig 2. The n-tier Tracking System Diagram

IV. PROBLEMS WITH THE EXISTING SYSTEM

The existing system consists of old blood bank service. This service can be obtained through the telephone calls via hospitals or through any acquaintances. The existing system is the manual system in which the donor first visit the hospital / blood bank and checks for following factors

- Filling up the form
- Searching for the donor
- Contacting all the donors

DRAWBACKS OF THE EXISTING SYSTEM

1. Cannot receive the blood on time as the donors are from various locations.
2. Extra clerical works.
3. Error handling is not efficient, since records are maintained manually.
4. Data management becomes tedious as the records increase.

5. Time consuming.

V. FEATURES OF THE PROPOSED SYSTEM

The proposed system consists of single click web application, which sends a request to the server, that server works as a message passer, which sends donors location, latitudes and longitudes to patient. With the help of GPS location tracking coordinates like latitude and longitudes, the system can easily route to the patient's location in faster way. Hence, this system can provide donor details at medical emergency. Medical assistance can also be obtained from the closest donor. Here with the help of GPS location tracking and details sharing the nearest donors can handle the emergency condition for the requested patient. If the user could not find any donor nearby his location, he can make use of the other blood bank's links which are provided in the website itself, so that the donors who are not registered in this portal can also be reached.

The Computer Aided Emergency Service System has the following advantages over the existing system

- Simple Interface with single click help.
- Patient can be served with blood quickly from nearby donors.
- Server works automatically and rapidly contact the nearest donor.
- If no donors registered in this website are present around, data will be pulled out from the database of the nearby hospitals.
- Centralized control.

VI. ARCHITECTURE OF THE SYSTEM

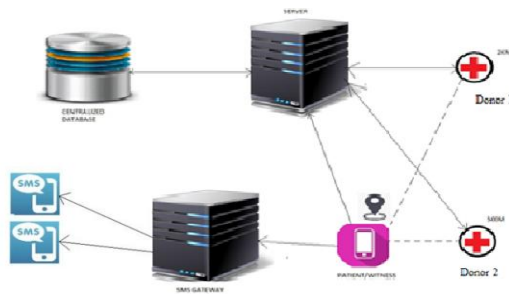


Fig 3. Block Diagram of CAESS

Based on the user's request, for the specific blood group, from the web form, the server will display a list of donors on that blood group in the web page. The patient's location is tracked using GPS module. Then the tracked location's geographical position will be sent to the Server. It will then send a list of donors who are nearby to the patient's location. Then, the SMS alert will be sent to the filtered list of donors. The framework of the system can be depicted as the follows,

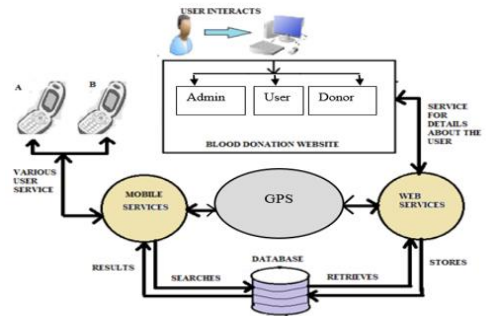


Fig 4. Framework of CAESS

VII. SYSTEM IMPLEMENTATION

The Computer Aided Emergency Service System is comprised of the following modules

- Registration module (Admin, Donors)
- Request for blood module
- Donor's location tracking module
- SMS alert

Registration Module

The Registration module consists of various web forms like Admin login, Donor's login, Registration Approval. Admin login form is used for administrative purpose like changing the path of storage and approving the registration. The Donor login form deals with collecting the donor's personal details such as, Donor's ID, Name, Contact details, Blood group, Age, Gender and Locality. The Donor is supposed to enter all the mandatory details so that they can be contacted correctly in case of an emergency. The Donor is authorised to update their details whenever they need. But only after the approval from the Admin, the details will be updated in the web form at every update. The Donor is authorized to change his Password alone but not his ID, which is maintained constant once he is registered initially.

Request for Blood Module

The Request for Blood module consists of simple interface provided in the web application with a single button click. This application is always connected with the web server and it

requires turning ON the GPS location in the android phone. On user's request, the details of all donors will be displayed in this page.

Donor's Location Tracking Module

The Donor's Location Tracking module is the most important as the location of the donor is tracked with the help of GPS module and Google Maps. The server will be sending donor id, donor name along with their latitudes and longitudes.

SMS Alert

The SMS alert module deals with the process of alerting the donors. The server will send SMS alert to the nearby donors from the patient's location. On receiving this alert, the donor will be able to get prepared for donating blood. This module will help us to receive blood as soon as possible, since the nearby donors are alerted. In case, no donors of the required blood group are available within certain distance, the user can make use of some other blood bank's links, available in the Contact page, which consists of different users who are not registered with the application.

VIII. CONCLUSION

The Computer Aided Emergency Service System achieves higher productivity by selecting the nearest donors in order to shorten the time requiring for reaching the patient. The expense is reduced while comparing with the other similar systems because of sending the request and receiving the reply done through Internet rather than SMS or voice call method. Since the system is implemented with simple user interface, user of any age can make use of the system easily. Also the CAESS is implemented with high social responsibility. Thus the portal is developed with NCES will help control a blood transfusion service and create a database to hold as data on donors in the wide area. Furthermore, people will be able to see which patients need blood supplies via the website. They will be able to register as donors and thus receive an SMS from the patients/clients who needs blood to donate blood in cases of need. The website will develop public awareness amongst its visitors of the hospitals' need for blood in order to supply the appropriate donors.

IX. FUTURE WORK

The Computer Aided Emergency System has its future scope as this can be converted into an android application so that user can install this application in their smart phone. The other future enhancement of the system are

- Tracking the geographical position of the donor.

- Options to handle multiple server connection within connect network.

- More efficient patient details sharing.

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WEB RESOURCES

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2. <https://www.microsoftvirtualacademy.com/csharp/sample>
3. <http://csharp.net-informations.com/data-providers/csharp-sql-server-connection.htm>