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Automated Blood Bank Using Embedded System

Saniya Mirza[1], Patil Pradnya[2], Gujar Sagar[3], A.R.Wagh[4]
[1,2,3,4]*(Department of Electronics & Telecommunication Engineering, S.N.D.College of Engineering & Research center, Yeola, Maharashtra, India.)*

Abstract: *Automated Blood Bank connects all blood banks, donors and blood needers in a single platform. It is a digital way to fulfill need of blood in country. The main aim of proposed system is to find required blood group with its blood components (WBC, RBC, Plateletand Hemoglobin).It also provides direct contact between donor and needer. This system is consisting of android app, cloud server and raspberrypie. Needers can easily find blood in blood banks or from person who is ready to donate blood using android app. Data is collected from donor and blood banks using android app and raspberrypi and complete data is stored on cloud server through PHP. Donorand needer can communicate with voice call or needercan get address of blood bank using google map*.

Keywords: *Android Application,Cloud server,CSS, Java, PHP,Raspberry Pi, XML.*

I. Introduction

Blood is a red liquid that circulates in the veins of humans and other animals, carrying oxygen to and carbon dioxide from the tissue of the body. There are eight blood groups namely A+,A-,B+,B-,AB+,AB-,O+,O-.Out of these blood groups O- is universal donor and AB+ is universal acceptor. There are many components of blood some of them are WBC, RBC, Platelets and Hemoglobin.WBC(white blood cells)is the cells of immunity system that are involved in protecting the body against infectious disease. The normal white cell count is usually between 4x10^9/L and 1.1x10^10/L.RBC(Red blood cells) carry oxygen from lungs to the body tissue and carbon dioxide as a waste product away from tissue. The normal range of RBC for men is 4.7 to 6.1 million cells per microliter (mcl) and for women 4.2 to 5.4 million mcl.Platelets are tiny blood cells that help your body form clots to stop bleeding. If one of your blood vessels gets damaged, it sends out signals that are picked up by platelets. The platelets rush at the site of damage and form a clot to repair damage. Normal range of platelets is 150,000 to 450,000 platelets per microliter of blood. In every two seconds of every day someone needs blood. Since blood cannot be manufactured it can be transferred from one person to anotherso effective management of donated blood is required. The proposed system connects all blood banks, donors and needer at common platform.

II. Proposed System

The automated blood bank using embedded system consists of three parts namely Android app, cloud server and Raspberry pi. Blood needer or patient can find required blood group with its component through android app. The raspberry pi is installed at blood banks and hospitals through which they can update blood bank data. Server is center of the system the complete data is stored at server. The needer can directly contact to donor through voice call and can get the address of hospital with the help of google map.

For this system we are using Raspberry pi B+ model. In this system on chip used is Broadcom CBCM2837B0, Cortex-A53 (ARMv8) with Broadcom videocore IV 300MHZ/400MHZ.it has 1GB LPDDR2 SDRAM.Dual-band 802.11ac wireless LAN (2.4GHZ and 5GHZ) And Bluetooth 4.2.consist of 4 USB ports with 40 GPIO pins. This Raspberry pi model support many operating systems like Unix,Linux,plan 9,windows 10 IOT,Free BSD,Net BSD,Open BSD etc

The above fig shows block diagram of automated blood bank using embedded system. Now we see the functionality of each block in detail.Needers and donors install this android app on their smart phones and can access this app by internet.

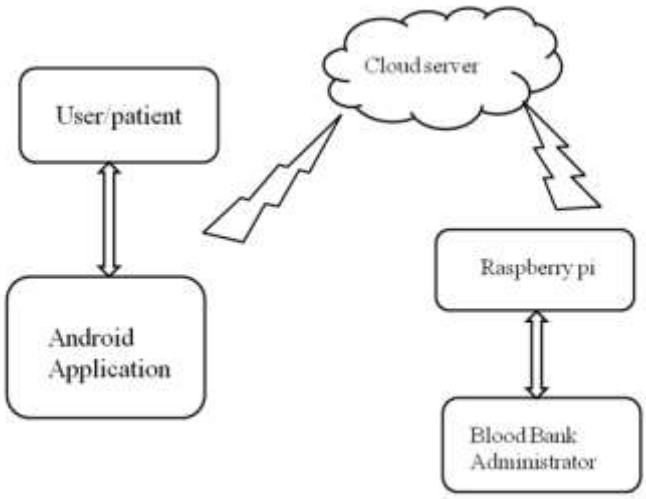

Fig1: Block Diagram of Automated Blood Bank using Embedded System

Blood banks update information of blood group and its component through raspberry pi.android app and raspberry pi communicate with server. The android app can be developed by java programming language.java is easy to understand, use, compile, debug and learn than other languages.Cloud server is simply collection of tables where data is stored.web page ex.www.bloodbank.com is created by different languages like XML (eXtensible Markup Language) ,CSS (Cascading Style Sheets) and PHP (hyper text transfer protocol).XML(extensible markup language)is set of rules for encoding documents in format that is both human-readable and machine-readable.css(Cascading Style Sheets)is style sheet language used for describing the presentation of document written in markup language like XML.PHPis simply server side scripting language that is especially suited for web development it is fast , flexible and pragmatic. It supports MySQL.MySQLis a freely available open source relational database management system (RDBMS) that uses structured query language (SQL). It is most popular language for adding, accessing and managing content in data base. It is most noted for its quick processing, ease and flexibility.

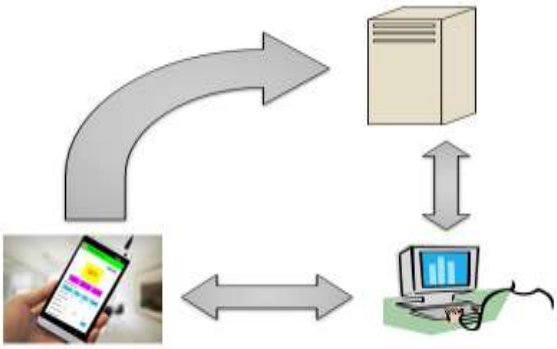

Fig2: pictorial representation of system work

The above fig 2 shows working of automated blood bank using embedded system. This system contains three parts user, blood bank and cloud server. Needer install android app on their smart phone and provide necessary information like mobile no, email id, blood group, and city. After this nearly available blood banks and donors information get display on cell phone. Needers can communicate to suitable donor by calling option or can visit to blood bank by address provided by googlemap. For donating blood donor first register through mobile app and provide information like name, mobile no, address, city, blood group.

III. Advantages

1. Provide common platform for donor and needer.
2. Data in blood bank can be updated time to time.
3. In emergency situations system require less time for operation.

4. Easy to find rare blood groups and its component

IV. Disadvantages

1. Illiterate people can't use this system properly.
2. System can work through internet only.

V. Results

VI. Conclusion

The automated blood bank using embedded system provides solution to fulfill requirement of patient through android app with internet connectivity.

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