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Automated Blood Bank Using Embedded System

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ABSTRACT: Automated Blood Bank is an associate work that brings all blood bank under one roof and those in need of blood onto a common platform. To fulfil every blood request in the country with a smart way. The proposed work aim to find matched blood group with its blood component (RBC, Platelet, Plasma) and provide it to the patient/ user in required time frame. It also provide transparency between users and blood bank administration. The system consist of android application for users/patient and Raspberry pi B⁺ as a computer for blood bank administrator. the cloud server is used for communication link between users and blood bank administration. Both are to be connected through internet connectivity also SMS facility is provided for user to know status of their requested blood group. The vision is to be "The hope of every Indian in search of a voluntary blood donor".

KEYWORDS: Raspberry Pi, Android Application, blood components, HTML, PHP.

I. INTRODUCTION

Blood is a body fluid in humans that delivers necessary substances such as nutrients and oxygen to the cells and transports metabolic waste products away from those same cells. There are three component of blood such as plasma platelet and RBC/WBC this component perform different activity in human body^[1]. In many cases such as accident , major surgery, mosquito-borne infectious disease like dengue, malaria. patient needs blood with specific component which is inadequate in patient body. We know that blood cannot be manufacturer it only passes from one human to another by donating blood. According to survey every year the nation requires about 4 Crore units of blood, out of which only a meagre 40 Lakh units of blood are available. So effective management of available blood stock can fulfil required need. The proposed system connect all blood bank together and provide common platform for user/patient who want blood. There are eight blood group as A+, A-, B+, B-, AB+, AB-, O+, O-. The man with o group is called the universal donor as all the people having accept it. The man with AB group called the universal acceptor.

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Table1: Donor and Acceptor Blood Group

TYPE	GIVE BLOOD TO	RECEIVE BLOOD FORM
A+	A+ AB+	A+ A- O+ O-
O+	A+ AB+ B+ O+	O+ O-
B+	AB+ B+	O+ O- B+ B-
AB+	AB+	EVERYONE
A-	A+ A- AB+ AB-	A- O-
O-	EVERYONE	O-
B-	B+ B- AB+ AB-	B- O-
AB-	AB+ AB-	AB- O- A- B-

The above table1 shows that blood group with respect to person who donate blood and who accept it. The doctor transfused blood component with respect to patient blood group.

II. RELATED WORK

Design and Implementation of Automated Blood Bank using Embedded Systems publish in IEEE Sponsored 2nd International Conference on Innovations in Information, Embedded and Communication systems. Author by BalaSenthil Murugan L and Anitha Julian. In this, author used sms based communication for acceptor and blood banks to receive or update data. for sending and receiving SMS author develop android application which is reliable for both users and blood banks. remaining system is developed with the help of raspberry pi board and GSM module.but the system is SMS based therefore system is to complex and takes more time of receiving or sending SMS. It also depend upon network availability^[2].

Smart Phones to the Rescue: The Virtual Blood Bank Project publish in the IEEE CS and IEEE ComSoc Author by Ramesh Singh, Preeti Bhargava, and Samta Kain. In this paper author developed a cloud based blood bank all user are connected to this cloud system and all blood bank are connected to sever. It provide common platform for both the donor and acceptor. Both are connected to common android application they are talk with each other to match their requirement with this system. But this system is not centralized and create many disturbed problem for donors and blood bank administrator^[3].

Blood Bank Management System using Cloud Computing for Rural Area author by Javed Akhtar Khan and M.R. Alony . Author develop this system with the help of mobile cloud computing and unique SMS numer. In this author record all the blood bank detail such as address ,phone numbers and customer representative number . The acceptor send his/her pincode to the system and it replies with nearest blood bank detail^[4]. In this system mobile cloud computing concept is very useful to develop such a system but SMS is not reliable for such system and data is not updated time to time^[4].

III. PROPOSED SYSTEM

The automated blood bank using embedded system. consist of three parts. The raspberry pi board connected to wifi connectivity which is connected to server system with the help of raspberry pi. The blood bank administrator update blood bag data in real time. The user or acceptor is connect through android application which also communicate through internet connectivity. Using this application user get information related to blood group and its component. This system is centrally connected through server therefore many blood bank can be connected. The communication is based on internet and also user get SMS at every stage of blood request processing.

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The small size laptop is capable of perform the many of thing that consumer desktop will perform, like spreadsheets, word-processing and browsing. It additionally plays high-definition video. It will run many flavors of UNIX operating system and is getting used to show children everywhere the plant the way to program. The secret sauce that makes this computer so tiny and powerful is that the Broadcom BCM2835, a System-on-Chip that contains associate degree ARM1176JZFS with floating purpose, running at 700MHz, and a Video core four GPU. It means that if the user plug the Raspberry Pi into HDTV, people could watch Blue Ray quality video, using H.264 at 40MBits/s. The new Model B+ also has a 10/100 Ethernet port so the user can surf the web (or serve web pages) from wherever they are using the Pi. The system volume no longer lives on an SD card but instead a micro SD card, so it is even easier to organize, run and rectify many totally different operating systems on an equivalent hardware. This means no more large SD cards and no more deceptively difficult to handle adapters Most Linux distributions for the Pi will happily live on a 8 GB micro SD card but larger cards are supported.

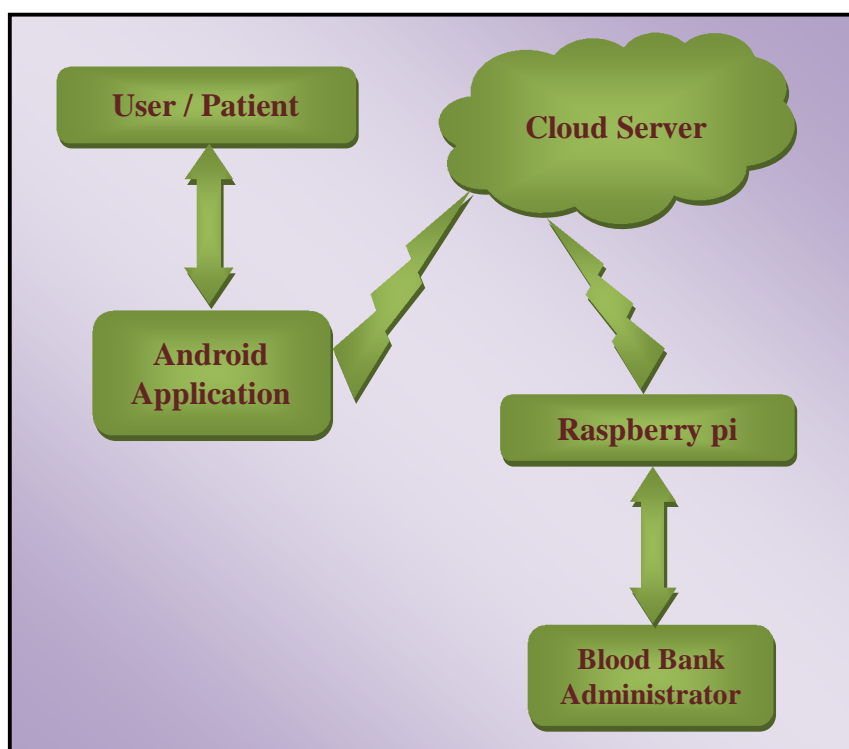


Fig1. Block Diagram Of Blood Bank System

The above figure1 shows block diagram of automated blood bank using embedded system. In this block diagram present all component of blood bank system such as android application, cloud server and raspberry pi B+ board. We see the fuction of each and every block.

The android application and embedded system are connected through internet or wi-fi .the user can access this system with the help of their mobile phones. this application communicate with server and server communicate with blood bank .The android application provide reliable access for users. There are serval advantages of android application such are it require only building software therefore cost is low . it is an open source and easy to build with the help of java programming

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The cloud server is a webpage as www.bloodbank.abhimoharkar.com this web page is created by different programming languages such as HTML(hyper text transfer protocol), PHP(hypertext preprocessor), CSS(cascaded style sheet), javascript. PHP code is integrated by a web server with a PHP processor module which generates the resulting web page. PHP is largely used for developing net primarily based code applications and conjointly to manage database, dynamic content, session chase, even build entire e-commerce sites. PHP5 version was utilized in this project. It support standard SQL and compiles on variety of platform. MySQL is open source, free to download and use. SMS is send by using SMS application gateway.

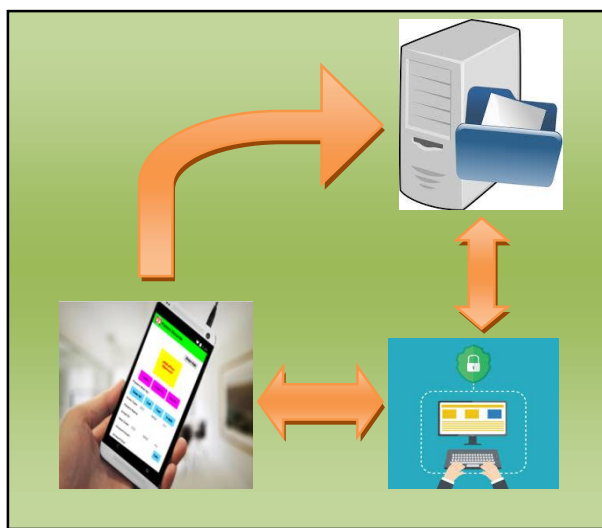


Fig 2. Pictorial Representation of System Process

The above figure2 shows the process of blood bank system. This process consist three different parts such as user ,blood bank administration, and web server. The user install android app on their phone, using this app user can complete process by entering their name, mobile number, blood group, city. After that user request blood by selecting blood group and blood component also user give detail of doctor name and diagnosis for record purpose. The administration see user request on real time and immediately reply request accepted or rejected. This reply is through SMS gateway and user received all SMS related to their request on the registered mobile number.

IV. CONCLUSION

The automated blood bank using embedded system provide pure solution for patient to match their need through most popular android system with the help of internet connectivity. This system provide common platform for blood donor and acceptor also very useful for blood bank to manage their blood requirement in day to day life.

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