

Automated Blood Bank and Patient Management System using Raspberry Pi

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ABSTRACT: Raspberry pi based blood bank system is proposed to bring voluntary blood donors and those in need of blood on to a common platform. The numbers of people who are in need of blood are increasing in large number day by day. This circumstance may lead to unavailability of blood during emergency. In order to avoid this critical situation, a system is designed to store the details of blood donors in the database. In this proposed system, information about the donors will be collected by using android application and raspberry pi. The Android application is used to manage and automate the blood inventory using online service. Using this application the administrator accesses the whole information about blood bank management system related to donor. User/Patients needs to access application and needs to enter his requirements about the blood in the application the requirements are matched with the database and message will be sent to that particular blood donor through GSM modem. This system can be used effectively for getting the details of available blood groups and user can also get contact number of the blood donor having the same blood group within the same city. TheRFID is used to monitor the patient records i.e., when the patient was lastly examined. The vision of this paper is “To provide a better service of every person who is in search of blood”.

KEYWORDS: Raspberry pi, Android application, GSM modem, IoT, RFID

I. INTRODUCTION

Every year the nation requires about 5 crore units of blood, out of which only 80 lakhs units of blood is available. We need blood for every two seconds. More than forty two thousand blood donations are needed every day. Although there are many blood banks, android applications, social media to help, but the time span between the donor and recipient in emergency situations became a barrier to communicate which is leading to death of the victim. All communication takes place via SMS which is compatible with all most all mobile devices. The donor will get an SMS as per the recipient request “Blood Bank System”. This paper gives better service in a very short span of time, who is in search of donors to provide immediate help. Every day more than fifty two thousands of blood donation units are required. In a year, complete of forty two million blood parts area transfused. In this system, Raspberry Pi and GSM to communicate with the mobile by wireless communication. In this proposed system there will be a donor’s details in database and when any user need a blood the user will keep a request a which blood group is need and the system will sort that related blood group details and send to user and also it will send a mail notification to users. This project is used to provide services like seeking donors who are willing to donate blood and also provide it in the time frame required. It is an endeavour to achieve dead set these people in want of blood and connects them to donors in case of emergencies. The problem is to find a willing donor at a particular time. This application updates the information regarding the donors and this information can be accessed by administrator. Donors are requested to enter their details, like name, phone number, and blood group. During the emergency of blood requirement, you can quickly check for blood banks or hospitals matching a particular or related blood group and reach out to them. In this system to upload data base like blood groups and donor details will uploaded in to server by using WIFI connectivity. RFID is known for its unique ID

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number. Using this advantage, the patient monitoring is done whenever he arrives at the hospital. Every patient is provided with a unique RFID number and all the details regarding the patient and treatments are stored in a centralized database which is retrieved by the server.

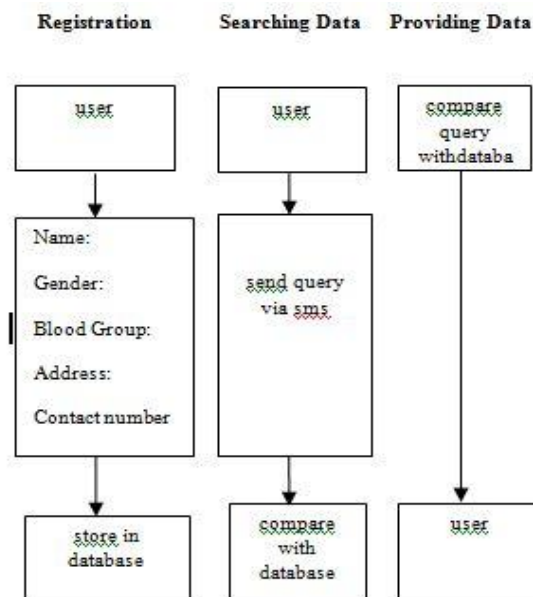
II. EXISTING SYSTEM

In the existing system donors need to register with the bank via SMS and his/her blood will be checked by nearest hospital, all the verified donors details are shared among the people who are requesting a particular group of blood, with the use of ARM processor. C.Nagarajan et al [2,8,11] have developed the drawback of ARM is that it has very limited RAM and the permanent store is few megabytes of flash memory. Due to this drawback only limited people can register with the hospitals and blood bank. Many hospitals currently use manual system for the management and maintenance of critical information. This information is often incomplete or does not follow management standards. Multiple copies of the same information exist in the hospital and this may lead to data inconsistency.

III. PROPOSED SYSTEM

The proposed work explores to find blood donors by using GSM modem and raspberry pi based system. In this system, it consists of android application, GSM Modem, raspberry pi kit. In android application, the person who wants to donate blood needs to register so that his information will be stored in the database. Application display three different screens such as Register, Query and about us screen. Donor needs to register his/her details such as Name, Gender, Address, Blood group and Mobile number. In query section patient needs to select required blood group and current address. Whole system is implemented using raspberry pi kit. Whenever there is requirement for blood then patient will enter required blood group details. Then that information will be fetched from database and SMS will be sending to the donor directly on his number which is stored at the time of registration. Hence there will be direct communication between donor and patient

PROPOSED SYSTEM FLOWCHART



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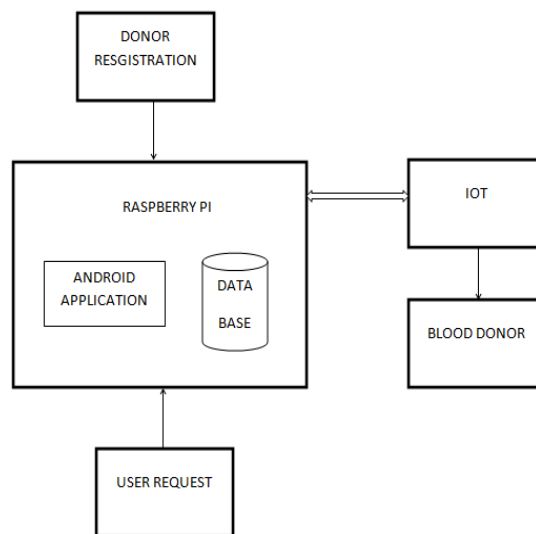
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PROPOSED SYSTEM FLOW

1. Person/donor who wants to donate blood needs to register his details
2. This details will be stored in raspberry pi system database
3. User in need of blood will have to select required blood group and current address
4. Corresponding blood donors information will be fetched and displayed on screen
5. Patient needs to select donor and send SMS option on the screen
6. SMS will be send to blood donor directly through GSM Modem

BLOCK DIAGRAM



BLOCK DIAGRAM DESCRIPTION:

Registration:

This function allows the donor and administrator to register as a user to interact with the system. The system requires the user to login before viewing and editing any information.

View and edit information online:

Donors are allowed to view their blood donation records online by their given account. They can also edit their personal information through the system.

Data is input by the Administrators:

The donor's information and donation records can be sent from the hospital to the administrator by calling or e-mail. The administrator is responsible for keying the received data into the system.

Recording donation records:

The system is able to record data of whole blood which is sent from the hospital.

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Manage blood inventory:

The system uses a First-In-First-Out stock management, where the blood stock that is checked-in to the system first will be the first one given to the hospital when requested. When the blood stock is expired, the administrator is responsible for removing the stock from the inventory and updating the system.

Blood requests:

The hospital can request blood via e-mail and by calling to the blood bank.

IV. HARDWARE DESCRIPTION

RASPBERRY PI

The Raspberry Pi is a credit card sized computer developed in the UK by the Raspberry Pi Foundation with the intention of promoting the teaching of basic computer science in schools. The Raspberry Pi is manufactured in three board configurations through licensed manufacturing deals with Newark element14 (Premier Farnell), RS Components and Ego man. These companies sell the Raspberry Pi online. Ego man produces a version for distribution solely in China and Taiwan, which can be distinguished from other Pis by their red colouring and lack of FCC/CE marks. The hardware is the same across all manufacturers. The Raspberry Pi has a Broadcom BCM2835 system on a chip (SoC), which includes an ARM1176JZFS 700 MHz processor, Video Core IV GPU, and was originally shipped with 256 megabytes of RAM, later upgraded (Model B & Model B+) to 512 MB. It does not include a built-in hard disk or solid-state drive, but it uses an SD card for booting and persistent storage, with the Model B+ using a MicroSD. The Foundation provides Debian and Arch Linux ARM distributions for download. Tools are available for Python as the main programming language, (via the RISC OS image or the Brandy Basic clone for Linux), C, Java and Perl. The Raspberry Pi hardware has evolved through several versions that feature variations in memory capacity and peripheral-device support.

GSM MODULE

GSM is a mobile communication modem; it stands for global system for mobile communication (GSM). The idea of GSM was developed at Bell Laboratories in 1970. It is widely used mobile communication system in the world. GSM is an open and digital cellular technology used for transmitting mobile voice and data services operates at the 850MHz, 900MHz, 1800MHz and 1900MHz frequency bands. GSM system was developed as a digital system using time division multiple access (TDMA) technique for communication purpose. A GSM digitizes and reduces the data, then sends it down through a channel with two different streams of client data, each in its own particular time slot. The digital system has an ability to carry 64 kbps to 120 Mbps of data rates. There are various cell sizes in a GSM system such as macro, micro, Pico and umbrella cells. Each cell varies as per the implementation domain. There are five different cell sizes in a GSM network macro, micro, Pico and umbrella cells. The coverage area of each cell varies according to the implementation environment.

FEATURES OF GSM MODULE

- Improved spectrum efficiency
- International roaming
- Compatibility with integrated services digital network (ISDN)
- Support for new services.
- SIM phonebook management
- Fixed dialing number (FDN)
- Real time clock with alarm management
- High-quality speech
- Uses encryption to make phone calls more secure
- Short message service (SMS)

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- The security strategies standardized for the GSM system make it the most secure telecommunications standard currently accessible. Although the confidentiality of a call and secrecy of the GSM subscriber is just ensured on the radio channel, this is a major step in achieving end-to-end security.

V. SOFTWARE DESCRIPTION

ANDROID APPLICATION

Android is a mobile operating system. It is an open-source framework and is based on Linux. The Android framework helps us to develop advanced and user-friendly applications. The applications can be built by using Java and Kotlin. The Android operating system has then gone through numerous releases by fixing bugs as well as adding additional features which make our life more comfortable and easy. Android technology is not constrained to only cell phones; nowadays there are many devices in the market that use it as their operating system. Devices like television sets, tablets, android auto cars, ebook-reader, and wrist watches use Android as the operating system. It is leading the global market. Most of the population uses Android devices. The applications we use every day have brought plenty of jobs available for Android developers in the market. As android is open source anyone can learn and build Android applications. Also, Android applications are compatible with a variety of devices. No doubt Android development is one of the enthusiastic and interesting jobs in this period of technology.

PHP

PHP is a server-side scripting language designed for web development but also used as a general-purpose programming language. It is used to create dynamic Web pages, or Web pages that update and display information depending on the user's activity. PHP code is interpreted by a web server with a PHP processor module, which generates the resulting web page: PHP commands can be embedded directly into an HTML source document rather than calling an external file to process data. PHP is designed to work well with the web, and so things like accessing the GET and POST and working with HTML and URLs are built-ins in the PHP language. This makes it really concise and straightforward to make a website

VI. CONCLUSION

The proposed system can be used to reduce time span between donor and patient. The system consists of android application, raspberry pi and GSM modem. There is direct communication between donor and recipient through SMS so in case of emergency this system plays important role. Results shows different screens of the android applications where user needs to enter blood requirements. Some organizations are collecting all the data of the voluntary blood donors and passing according to the message request and also updating into database and it will bring a vast change in the place of necessity of the Blood. This system can overcome the death rate and increase the availability of blood donors in a short span of time.

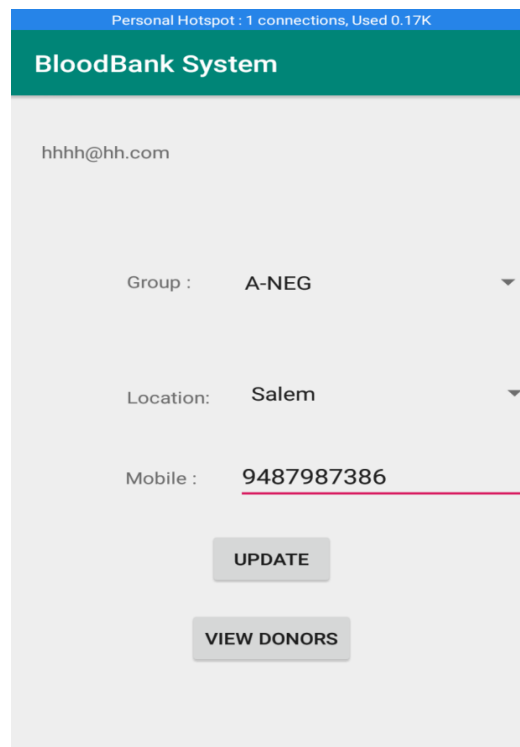
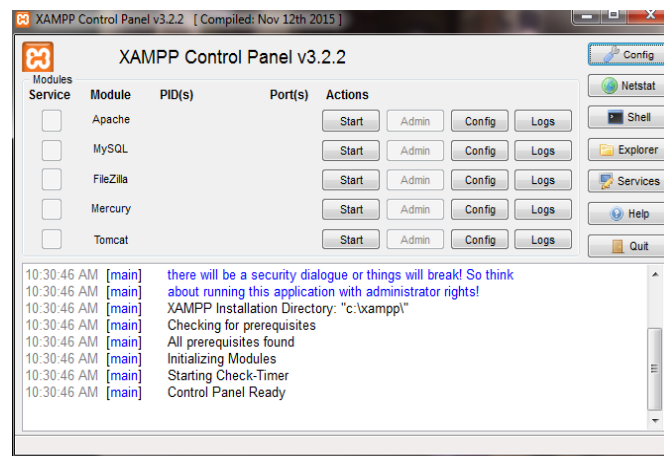
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VII. RESULT

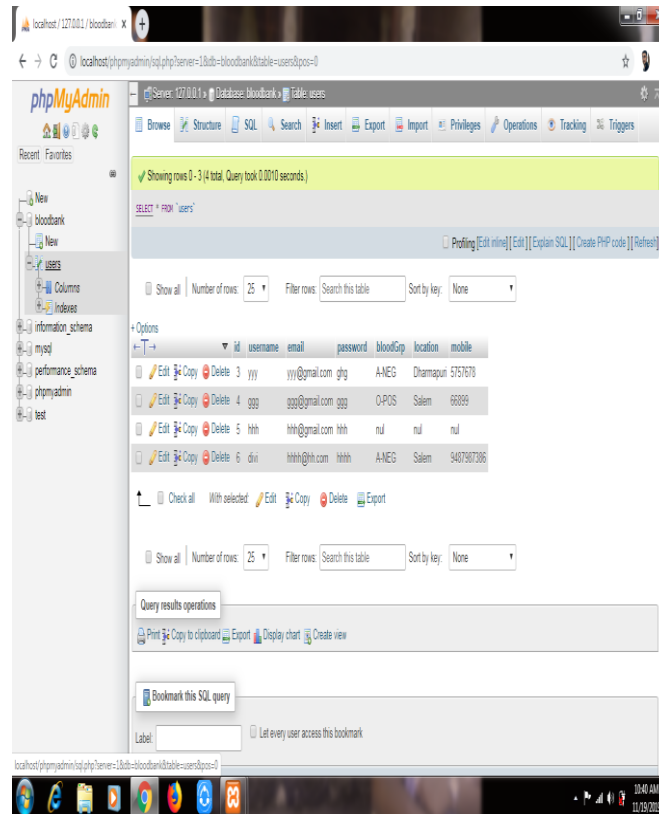


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