Automation in a Blood Bank System using Raspberry PI

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Abstract: This paper proposes the implementation of a blood bank system that helps thousand of peoples to survive from the blood requirements. The proposed system makes the process of blood requirement automatic with the help of raspberry pi, GSM, IR sensors, LCD display and android application. The proposed system can be installed at the hospitals, blood banks etc. that help the patient to easily find out the required blood. The data of all the donors of different area is collected by the MIT software application and stored in the raspberry pi processor. Donors/ patients needs to access the application. The requirements are matched with the database and SMS containing the detailed information of the donor will be sent to the patient.
Keywords: Raspberry pi, IR sensor, blood bank, GSM modem, LCD display, android application.

I. INTRODUCTION

Fig.1 Blood Bank

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. Human blood is lacking in quantity and quality which is value able and much in demand. Some patients have daily need of blood those who are suffering from cancer and also accidents cannot be predicted so blood may be require at any minute. For that direct communication between the donor and recipient becomes necessary to avoid longer time span in the availability of blood.

II. LITERATURE SURVEY

In [1] "A Review on implementation of SMS based automated blood bank for rural areas". Automated Blood Bank using Raspberry Pi is an associate work that brings voluntary blood donors and those in need of blood on to a common platform. The term "blood bank" refers to a division of a hospital where the storage of blood product occurs and where proper testing is performed. Automated Blood Bank tries to help victims/patients/those in need of blood. It is an Endeavour to achieve dead set   these people in want of blood and connects them to those eager to donate. The mission is to fulfill every blood request in the rural areas with a promising SMS application and motivated individuals who are eager to donate blood. the proposed system in this project utilizes Arduino microcontroller. The quality of the water is monitored with the help embedded sensor and its information is processed by the Arduino UNO microcontroller. The proposed system creates the awareness among the peoples regarding the quality of the water.

In [2] the paper "Embedded Blood Donating Application" proposed to bring the voluntary student blood donors to one place. The mission of this paper is to fulfill every blood request by using an android application "student blood donor". Our aim to propose this paper is to reduce the time span between the donor and recipient. By using Raspberry pi 2 and GSM modem SIM900A, we collect all the data base of the voluntary students blood donor information from educational institution and fetch the given data as per message request from recipient. The fetched blood donor data is sent to the recipient and also with addition an IP Address is attached to the message which allows the recipient to download an app and get all the information of the student. This paper presents the novel method for monitoring the quality of the water. The major issue of today's world is the water pollution that results in dangerous life taking diseases. The proposed method in this paper utilizes turbidity sensor that determines the quality of the water. The proposed system uses LPC2148 microcontroller for processing the information of the senor on both LCD and web server.

In [3] this paper "Raspberry-Pi Based Embedded Blood Donating Application" proposed to bring the voluntary student blood donors to one place. The mission of this paper is to fulfill every blood request by using an android application "student blood donor". Our aim to propose this paper is to reduce the time span between the donor and recipient. By using Raspberry pi 2 and GSM modem SIM900A, we collect all the data base of the voluntary students blood donor information from educational institution and fetch the given data as per message request from recipient. The fetched blood donor data is sent to the recipient and also with addition an IP Address is attached to the message which allows the recipient to download an app and get all the information of the student.

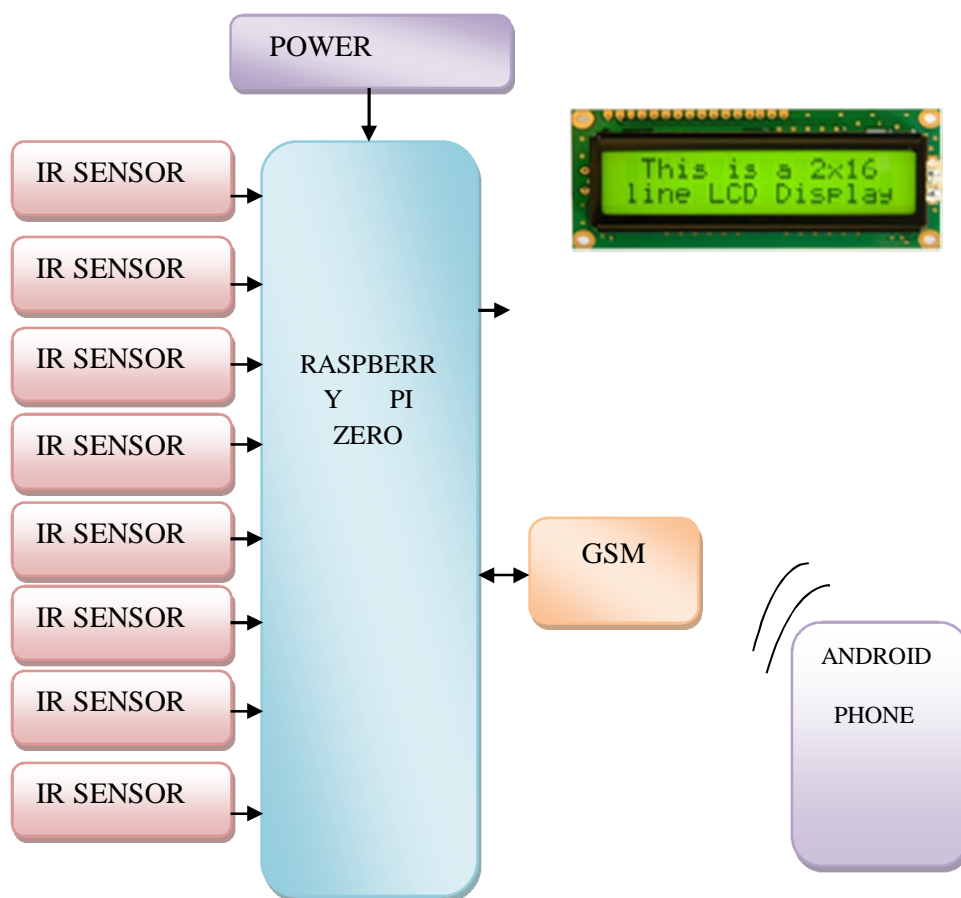## III. PROPOSED DESIGN METHODOLOGY

A. Block Diagram

Fig. 2 Block diagram of proposed system

IV. HARDWARE IMPLEMENTATION

A. Components Required

1) *Power Supply:* The total power supply is 5V 2A.

2) *IR Sensor:* A multipurpose infrared sensor whose input voltage is 5V DC. It comes with an easy to use digital output and can be used for wireless communication and sensing IR remote signals. It provides a digital output. Whenever an object is placed in front of the sensor logic one (+5V) will be the output of the sensor and a logic zero (0V) when there is no object in front of sensor. An LED is used to indicate the presence of an object and the digital output can be directly connected to Raspberry Pi. In this implementation higher sensor is used to check the availability of blood.

3) *Android:* The android application is design using MIT app inventor. It is a visual programming based environment and an open source web application for android provided by Google and maintains by Massachusetts Institute of technology it provides graphical user interface.

4) *Raspberry Pi Zero:* The credit card size laptop is able to do many items like desktop laptop will do such as word processing spread sheets and games and plays high definition video. It runs Linux operating system. The Raspberry Pi comes with a open source technology which means communication and multimedia webbed technology.

5) *LCD Display:* Alphanumeric LCD display module, it means it can display both alphabets and numbers. It consists of two rows each row prints 16 characters and can work on both 8 bit and 4 bit mode. The operating voltage of an LCD display is 4.5V-5.3V.

6) *GSM:* Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication. In 1991 GSM was first launched in Finland. GSM modem is a modem in which SIM card is accepted in the mobile operator prospective it like a mobile phone. When a GSM modem is connected to a computer, it allows the system to use GSM modem to communicate over the mobile network. These GSM modem are used to provide internet mobile connectivity, most of them are used for sending and receiving SMS.

V. EXPERIMENTAL SETUP AND RESULTS

The proposed system provides the blood requirement details to the donor by making use of Raspberry Pi processor and GSM modem. The system consists of 8 IR sensors that determine the availability of the 8 blood groups and simultaneously display this information on 16*2 LCD. The proposed system uses MIT software application through which the user can register the details such as name, address and mobile number. The acceptor has to enter the details such as name, address and required blood group, then the acceptor has to click the require button to check the availability of the respected blood. After checking the availability of respected in the particular required area, the Raspberry Pi processor initiates the GSM to send an SMS to the acceptor registered number. The SMS sent to the acceptor consists of the details of donor's name, address, blood group and mobile number. Thus the proposed system creates the direct communication between the donor and the patient.
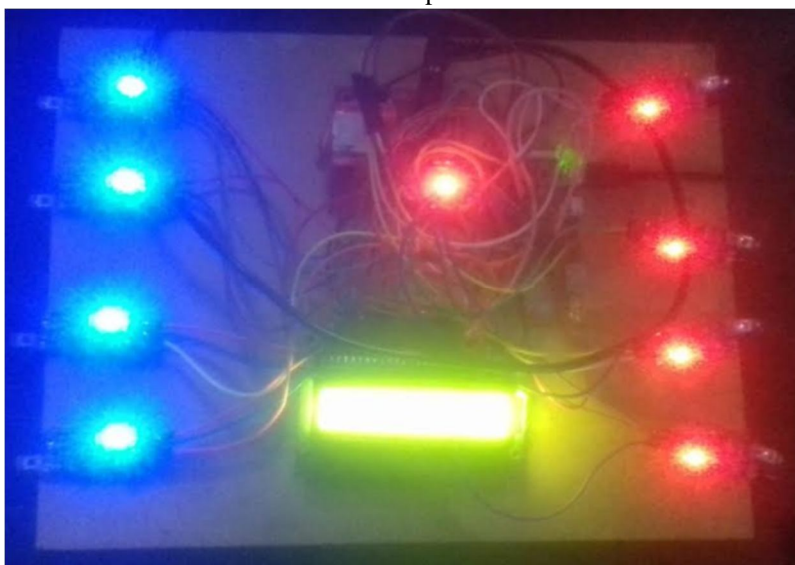

Fig. 3 Experimental setup of Automated Blood Bank

The following figures represent the LCD displaying availability of blood, android application through which one has to find the matching donors and the SMS sent to the donors.
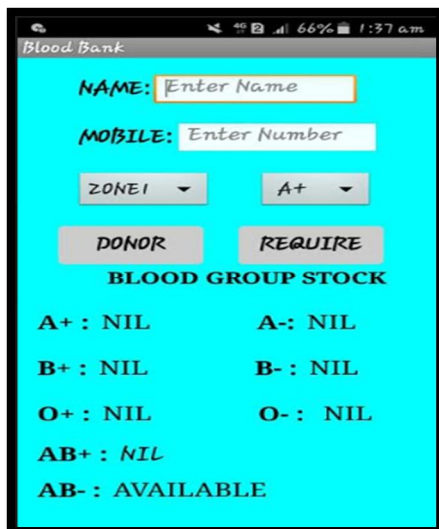

Fig. 4 LCD display availability of blood
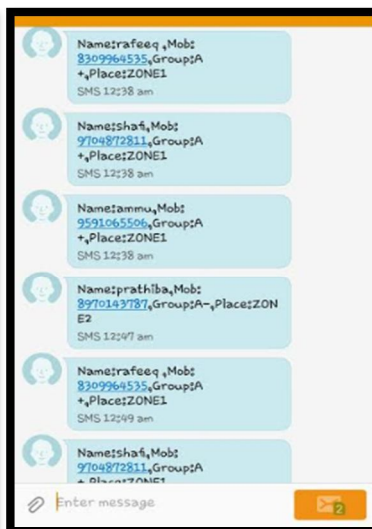

Fig. 5 Android application

Fig. 6 SMS sent through GSM

VI.   CONCLUSION

The aim of this paper is "To provide a better service of every person who is in search of blood". The proposed system is finds out the blood donors to the patient within no time with the help of MIT software application. Thus the proposed system establishes direct communication between the donor and the patient by contacting to the mobile number which is present in the SMS sent to the patient.

REFERENCES

[1] Bala Senthil Murugan L, "Design and implementation of automated Blood bank using Embedded System" (2015).

[2] Pooja A. Taywade, "A Review on Implementation of SMS Based Automated Blood bank Using Raspberry-Pi for Rural Areas (February -2016).

[3] M. Geetha Pratyusha ,"Raspberry-Pi based Embedded Blood Donating Application (April-2016)

[4] T.Gayatri Devi," Automated Blood Donating and managing System using Raspberry-Pi B+ (April-2017)

[5] K Saravani,B Sujatha," Design And Implementation of Blood bank Monitoring System Using Raspberry-Pi (May-2017).

[6] https://www.google.co.in/search?client=opera&q=raspberry+pi+zero&sourceid=opera&ie=UTF-8&oe=UTF-8.

[7] https://www.google.co.in/search?client=opera&q=ir+sensor&sourceid=opera&ie=UTF-8&oe=UTF-8.

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