Automated Blood Donating And Managing System Using Raspberry Pi B+

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Abstract:

This paper is to survive the people from the blood requirements. Upto now we have an android app to find the nearby blood bank but it take more time to fill the details and these are operated only with internet. But lot of people don't know how to operate the smart phones from village background even though if they know to operate we cannot assure that net may be available all the time. In order to overcome the past drawbacks in this project an SMS based accessing is done which is easy to access by all the people even from village background. The paper "Raspberry Pi Based Embedded project of Blood Donating " proposed to bring the voluntary student blood donors to one place. The mission of this paper is to fulfil every blood request by using an SMS based GSM module. My main aim to propose this project is to reduce the time span between the donor and recipient. By using Raspberry Pi B+ and GSM modem SIM900A, i collect all the data base of the voluntary students blood donor information from all the institution and fetch the given data as per message request from recipient. If blood is not available it send the recipient details to all the previous donors of that particular blood The vision of this paper is "To provide a better service of every person who is in search of blood"

Keywords:

Raspberry Pi , Management of Blood Bank, GSM Modem ,Blood , Hospital, Donor, Recipient,SMS.

INTRODUCTION :

Per annum the need of blood is drastically increasing, even though we are rich in technology but fails to bring communication between the donor and recipient on to the same platform. Per annum we require around 50million blood units but we have only a scanty 5million blood units are available. This is a main drawback particularly in case of emergency blood requirement .The main goal of this project is to liaison donor and recipients in required time frame. Accidents cannot be predicted.So, blood may be required at any minute. In present scenario both blood donors and blood banks are available but cannot capable to reach their information to the needy people.

in the given time. A high-efficient, easily available and scalable system has to be developed to bridge the gap between the donors and the recipients and to reduce the time required to search for blood donors.

Factors to be considered for blood donation:

A donor should be a person who is between 18-60 years of age and not addicted to drugs and not contacted jaundice in the previous three years. And whose heamoglobin count is above 12.5 g/dl and weight should not be less than 45 kgs.Body temperature and blood pressure must be normal at the time of donation. Donor must be free from all the diseases and make sure that has not taken any medicine in the last 48 hours.

Raspberry Pi B+ :

It look like a credit card but it perform as a mini computer .it used for many things that desktop PC does like video word processing,spread sheets,home automation server,parent detectors to weather stations,tweeting houses of birds with IR cameras etc.

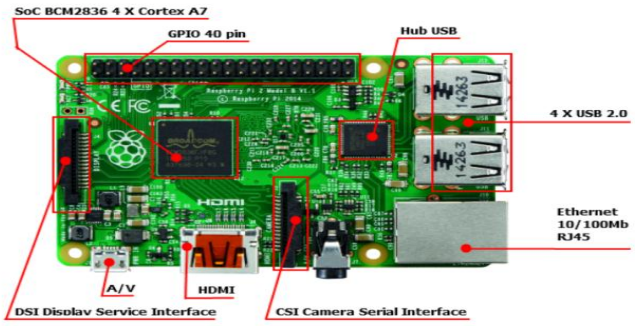

fig: image of raspberry-pi

The B+ board has also been designed with add-on boards in mind.This means that you can be more flexible with your projects and add the funtionality that you need.The main core architecure used in the Raspberry piB+ is ARM11 device core.The Raspberry piB+ had an Processor chip BCM2835 and this processor is cpu type..A Hardware Attached on Top(HAT) board enables the B+ to automatically configure GPIO and driver setup for compatability with any add-on-board,128 MB was allocated by default to theGPU.

Compare to model A, model B has 4 USB ports.And in model B it also provide ethernet IEEE 802.3 connectivity .Here we use micro SD card in model B instead of macro SD card in previous model.it has 40 GPIO(general purpose input output).it has low power consumption ie 0.5W to 1W. The Raspberry Pi 2 is based on the Broadcom BCM2836system on a chip (SoC), which includesan ARMcortexv7 900mhz processor, Video Core IV GPU, and was originally shipped with 256 megabytes of RAM. The Raspberry Pi 2, was released in February.

Auomated blood bank:

Here I use GSM module in which SIM is placed which act as antollfree number and GSM module is used to interface with an computer to transfer the information whenever the person who requires particular blood group sends SMS to the toll free number. So here the input is SMS.

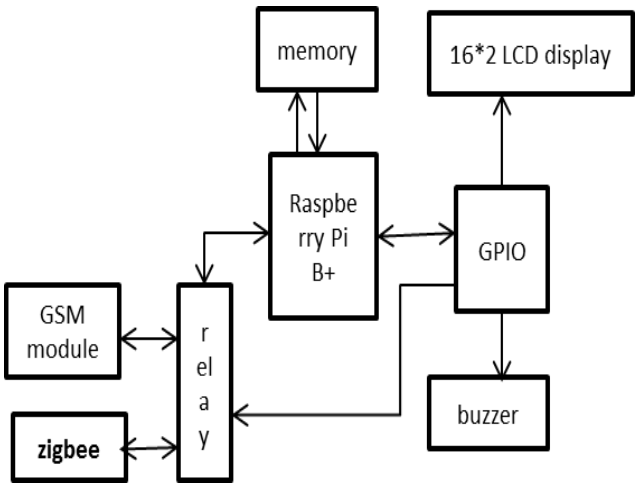

Fig: Server

Then GSM module transmit this request to the Raspberry Pi B+ which act as an minicomputer in this it act as a server or data base .Whenever the message is received the information is displayed in LCD through GPIO and buzzer is used for indication. Then the Raspberry Pi B+ respond to the request and it start searching in blood banks, here 8051 Micro Controller act as an blood bank and by using relay the Raspberry Pi communicate simultaneously with the GSM module and Zigbee . Here Zigbee act as an antenna it transmit information to the receiver antenna which is at blood bank. whenever a blood group request is accepted at the receiver antenna i.e.Zigbee it enables the 8051(AT89C52) MC.

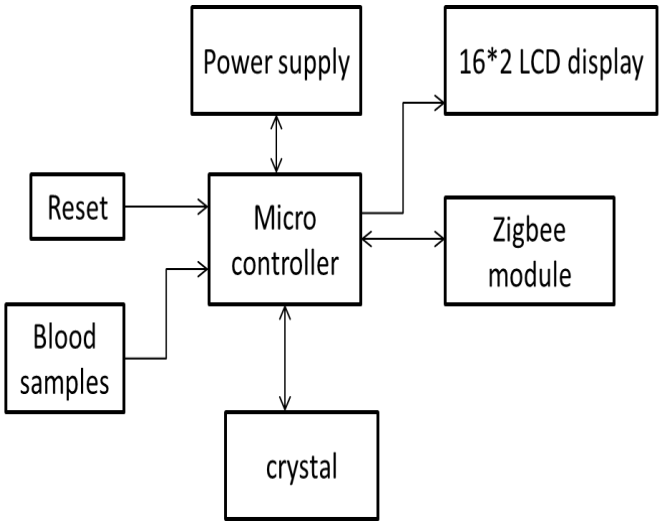

Fig: Blood Bank

In 8051 MC the blood samples are placed between IR LED. If blood is present it send that particular blood bank information to the person who requested for blood through GSM module via SMS output is also SMS and if blood is not present then it send the recipient details to all the donors who donates that blood previously.

Flexiblity for operating:

Here I use GSM,it give flexiblity for every one because it is an SMS based input and output so easy to communicate by all the citizens who need blood in emergency technology.

GSM modem :

In 1991GSM was first launched in Finland A 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,that allows the system to use GSM modem to communicate over the mobile network. These GSM modems are used to provide internet mobile connectivity, most of them are used for sending and receiving SMS.

Fig: image of GSM modem

Software Tools:

Software used for this is keil compiler where the machine language code is compiled and written. After compilation, the machine source code is converted into hex code which is to be dumped into the microcontroller for further processing. Keilcompiler supports C language code.

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Outputs:

To install the Raspbian OS we have to copy the image file into the SD card, for this purpose we require Win 32 Discimager software. We can select the path where the imagefile was stored and also the device to which we require to copy image file and then select thewrite option.

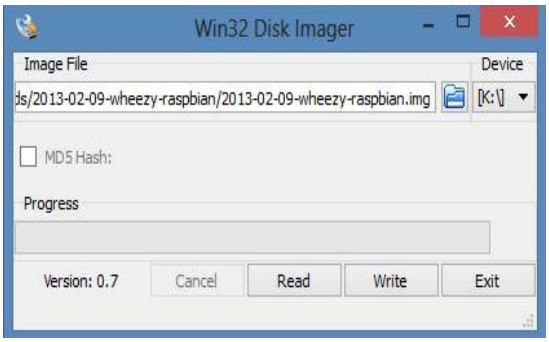

Fig 1.1: The screen shot of win 32 disc imager

After installing the Raspbian OS we can get the Raspberry pi desktop as shown in the fig 1.2 which is similar to our normal computer desktop.

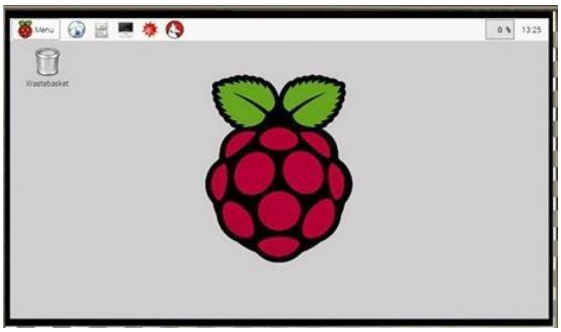

Fig 1.2:Screen shot of Raspberry Pi B+ desktop.

When we run the program initially it will display the all donors list stored in the
database and it will wait for new SMS request as shown in fig 1.3.

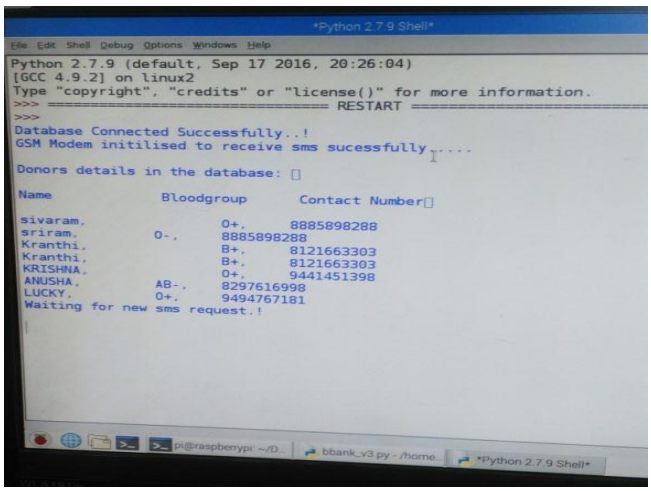

Fig 1.3: Screen shot of operations done in the data processing module

When ever a new SMS request was came it will check for the availability of the bloodat blood bank. If blood is available at blood bank then it sends the contact details of blood bank otherwise he get the eligible donors list from the database as shown in the fig 1.4.

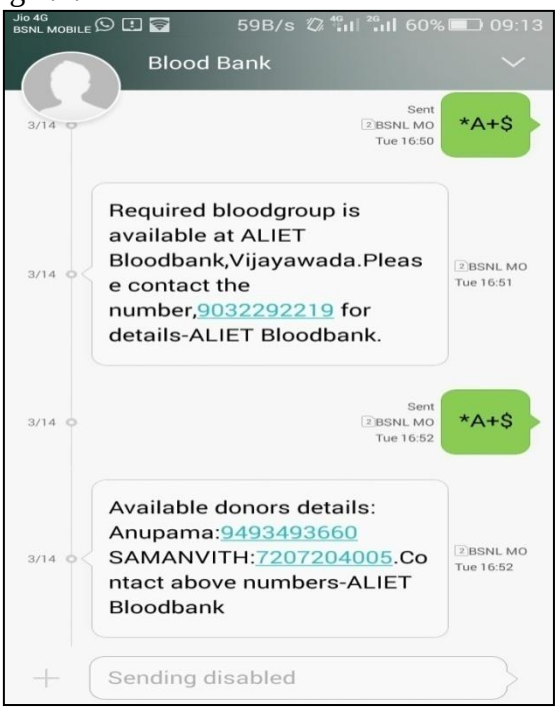

Fig 1.4: Screen shot of blood request by user and its response.

Conclusion:

Technology is introducing new innovations day by day, thus abate the time required to do things. The proposed system can be used to reduce the time required to deliver required blood to the needy in cases of emergency. It also provides them with the facilities of communicating with the nearby donors in emergency. The database is a vital aspect of the system. The database of the blood banks and the hospitals must be checked for consistency on regular basis for smooth running of the system. Blood is the primary necessity of life. There are different scenarios available for searching blood donors. This project will be a one step ahead from the other blood donation systems. Blood donors can contact the blood recipient directly by using this system.

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