Design of SMS based Automated Blood Bank using Embedded System

Pavitra H V, Dr. G.F. Ali Ahammed
IV Sem M-Tech, Assistant Professor
Dept of Digital Electronics & Communication Systems
VTU PG CENTRE,MYSURU

***Abstract*-Now a days demand for the healthy blood is increasing very rapidly as the hospitals are increasing and the peoples are getting affected to the deceases frequently, providentialy the mood of the people are also changing, compared to the older days we are able to many number of donors, Many peoples are coming forward to donate the blood and we are able to see the lot of blood donation camps are conducting across the globe, many number of blood banks are opened, few of them are associated with the hospitals, few of them are charity based also many multi-national companies are entered in to the blood bank business.In this project we are presenting on SMS based automated blood bank, which connects donors and patients through SMS, Donors need to register with the bank via SMS and his/her blood will be check by nearest hospital, all the verified donors details are shared the people who requesting the particular group of blood, we are using ARM7 HDMI LPC2148 controller along with SIM 800 GSM network, EEPROM is working as a Database and system yields all the expected results with 99% Accuracy.**

Key words:ARM 7 HDMI LPC2148 ;Automated blood bank; Embedded Systems; Blood Donors; GSM .

I. INTRODUCTION

A blood bank is a center where blood gathered as a result of blood donation is stored and preserved for later use in blood transfusion. The term "blood bank" typically refers to a division of a hospital where the storage of blood product occurs and where proper testing is performed (to reduce the risk of transfusion related adverse events). However, it sometimes refers to a collection center, and indeed some hospitals also perform collection.Whole blood or blood with RBC is transfused to patient with anemia/iron deficiency. it also helps to improve the oxygen saturation in blood. It can be stored at 1.0°c-6.0°c for 35-45 days [platelate transfusion] It is transfused to those who suffer from low platelate count. this can be stored at room temperature for 5-7 days. [Plasma transfusion] This is indicated to the patients with liver failure, severe infections or serious burns A fresh frozen plasma can be stored at a very low temperature of -25°C for 12 months**.**

Everyyear the nation requires about 4 Crore units of blood, out of which only a meagre 40 Lakh units of blood are available. There are multiple blood banks around the world; however none of them offer the capability for a direct contact between the donor and recipient. This isoften a serious disadvantage notably in cases wherever there is associate degree pressing would like of blood. This project aims to beat this communication barrier by providing an immediate link between the donor and therefore the recipient by victimization low price and low power Raspberry Pi B+ kit. It requires Micro USB of 5V and 2A power supply only. All communication takes place via SMS (Short Messaging Service) which is compatible with almost all mobile types. "Automated Blood Bank" proposes to bring voluntary blood donors and those in need of blood on to a common platform.

II. LITERATURE SURVEY

[1] "Data Mining to Improve Safety of Blood Donation Process".The paper presented by Madhav Erraguntla, Peter Tomasulo, Kevin Land, Hany Kamel and Barbee Whitaker in year 2014 describes Data Mining to improve safety of Blood Donation process gives the collection and analysis of information related to reactions associated with the process of blood donation [1]. It uses Donor Hart tool and Data Mining techniques to improve donor's safety. The limitations of this system are it fails to apply early Prevention Methods to o the donor.

[2] "A New Concept of Blood Bank Management System using Cloud Computing for Rural Area (INDIA)".The paper presented by Javed Akhtar Khan and M.R.Alony in year 2015 describes a new concept of Blood Bank Management System using Cloud Computing for Rural Area provide us the facility to provide a blood to any time and any situation to seeker apart from that seeker is also able to call the donor in emergency[2]. The limitations of this system are it just maintains Blood Bank data and does not focus on donor reactions while donating blood.

[3]"Reduce Complexity of Blood Donation Process and Make It Safe by Using Data Mining".The paper presented by Yamini M. Balonekar and S. S. Dharde in year 2015 focuses on the reaction types and various parameters of blood using different techniques like DonorHart tool using Donor Hemovigilance Method[3] and Data Mining techniques.

[4] "Android Blood Donor Life Saving Application in Cloud Computing".the paper presented by T. Hilda Jenifha and R. Backiya Lakshmi in the year 2014 describes the Android Blood donor[4] life saving application in Cloud Computing with a purpose to develop a computer system that will link all donors to help and control a blood transfusion service and create a database to hold data on stocks of blood in each area of city as data on donors using supply chain networks and RVD Algorithm but meets to

one of its limitations as supply chain networks are more complex than other algorithms.

[5] "A framework for a Smart Social Blood Donation System based on Mobile Cloud Computing".The paper presented by Almetwally M. Mustafa, Ahmed E. Youssef and Gamal Ashorbagy in year 2014 describes a framework for a smart social Blood donation system based on Mobile Cloud Computing, which facilitates communication between blood donors and blood donation centres so that the appropriate donor can be reached just on time using Mobile Cloud Computing but a wide range of applications are difficult to run in Mobile devices.

Base paper

[6] "Design and implementation of automated blood bank using embedded system".Automated Blood Bank is an associate work that brings voluntary blood donors and those in need of blood on to a common platform. The mission is to full fill every blood request in the country with a promising android application and motivated individuals who are willing to donate blood. The proposed work aims to overcome this communication barrier by providing a direct link between the donor and the recipient by using low cost and low power Raspberry Pi B+ kit. It requires Micro USB of 5V and 2A power supply only. Entire communication takes place via SMS (Short Messaging Service) which is compatible among all mobile types. "Automated Blood Bank" is an project that brings voluntary blood donors and those in need of blood on to a common platform. This project aims at servicing the persons who seek donors who are willing to donate blood and also provide it in the time frame required. Automated Blood Bank tries to assist victims/patients/those in want of blood. It is an endeavour to achieve dead set these people in want of blood and connect them to those willing to donate. The proposed work explores to find blood donors by using GSM based Smart Card CPU Raspberry Pi B+ Kit. The vision is to be "The hope of every Indian in search of a voluntary blood donor".

III. PROPOSED SYSTEM

All communication takes place via SMS (Short Messaging Service) which is compatible with almost all mobile types. "Automated Blood Bank" proposes to bring voluntary blood donors and those in need of blood on to a common platform. This project is originated on an android APP, this will help to find the donors. Blood donor will participate in donor list using APP. Suppose if any need in blood, will get the donor list in this APP. Here in this APP, only 3 Blood group (A+, B+, O+) Data base is established. The recent interested donor number will be available in the data base. This project uses GSM modem interfaced to the controller i.e. LPC2148. GSM is interfaced through the MAX232 to the Controller.

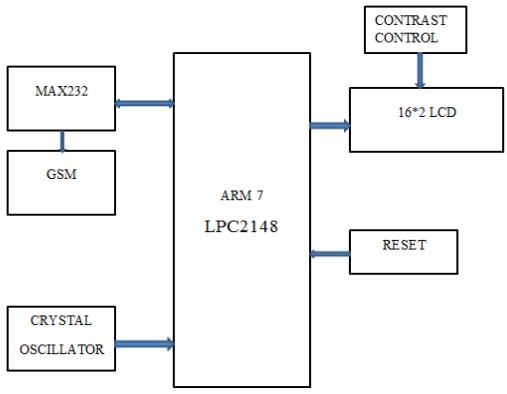
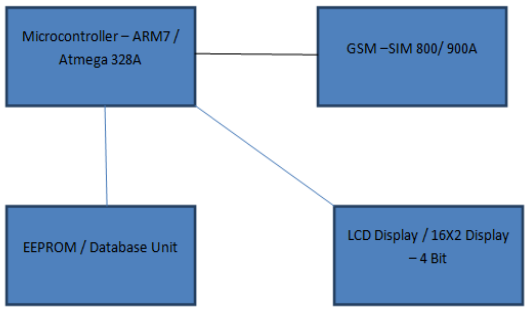


Figure 1: Proposed block diagram

Automated Blood Bank brings voluntary blood donors and those in need of blood on to a common platform. Through this application, individuals look for donors who are willingto gift blood, furthermore as give the timeliest support to those in frantic want of it.

The mission is to fulfill every blood request in the country with a promising web portal and motivated individuals who are willing to donate blood. The vision is to be "The hope of every Indian in search of a voluntary blood donor". The motto - "Donate blood to save the most precious precious human life". Ibrahim. M and M. Youssef (2012), 'Cell Sense: An Accurate Energy-Efficient GSM Positioning System Vehicular Technology.



In this Methodology, We are using the ARM Controller as the ARM7 LPC 2148 as the central core which is connected to the GSM Module SIM 808/ SIM 900, EEPROM will be connected externally to the microcontroller and which acts like a Database, also ARM Processor will be provided with the list of message formats to read and reply the specific kind of Messaged, the entire system I specifically connects the donors and the patients over the SMS.

This System will be similar to the architecture, which is made up of Microcontroller, GSM, Display and Memory, but with the many capacities, in the overview one mobile is communicating with the lot of other mobiles over the SMS, this Master mobile is usually referred as the automated blood bank as shown in the next figure.

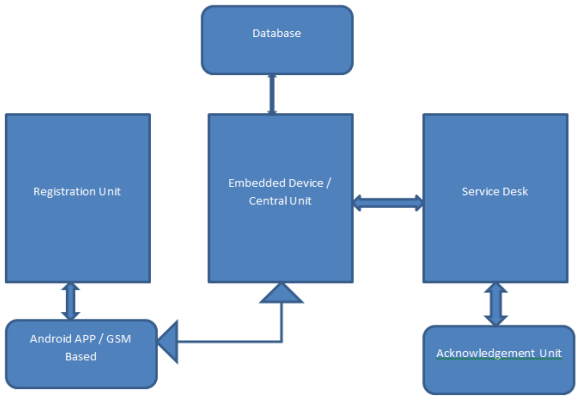


Figure 2: Functional block diagram

Above figure Shows the functional block diagram of the blood bank system, where central core will supports two segments, Namely

1 Registration UNIT

2 Service Desk

1.Registration Unit:Whenever a person want to become the donor, then he need a send a SMS to the ABB master number as NAME <Blood Group>, Upon accepting the Messages, system automatically replies with a welcome message with the contact details of the hospital to undergo for blood check up to identify the quality of the blood, also one notification message will go to hospital to conduct the test, once test is done positively then hospital need to send the message to ABB, upon receiving the message ABB will confirm the Donor as Healthy person to donate the blood, all these activities will be handled by the Registration Unit

2.Service Desk:When Somebody need the blood of particular kind of blood group, the person need to send a SMS like <Blood Group>, Immediately ABB will send the list of Donors with contact numbers to the requested Person.

VI. IMPLEMENTATION

Keil:Compilers are programs used to convert a High Level Language to object code. Keil is a cross compiler. The compiler used for cross development is called cross compiler. Cross compilers are used to generate software that can run on computers with a new architecture or on special-purpose devices that cannot host their own compilers. Cross compilers are very popular for embedded development, where the target probably couldn't run a compiler. There are several advantages of using cross compiler. Some of them are described as follows:

- By using this compilers not only can development of complex embedded systems be completed in a fraction of the time, but reliability is improved, and maintenance is easy
- The ability to combine variable selection with specific operations improves program readability

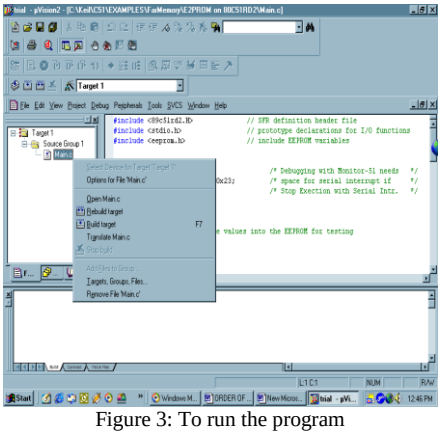
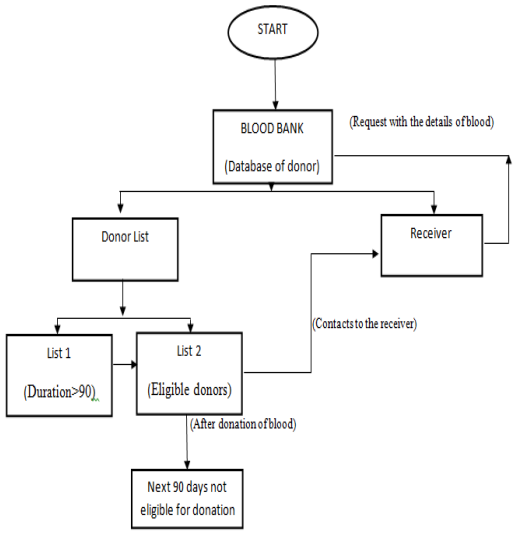


Figure 3: To run the program

Flow chart



V. RESULT AND OUTPUT

Blood donation may be an easy straight forward fourstepprocess: registration, case history, donation and refreshments. Every blood donor is given a miniphysicaltest,checking the donor's temperature, pressure,pulse and Hb to guarantee it is safe for the donor to administer blood. The actual blood donation usuallytakes less than 10-12 minutes. The whole method, from the time arrives to the time to go away, takes concerning Associate in Nursing hour and 15 min. The average adult has concerning 10 units of blood in his body. Roughly 1 unit is given throughout a donation.A healthy donor might give red blood cells each 56 days, or double red cells each 112 days. A healthydonor might give platelets as few as 7 days apart, however a most of 24 times a year. All given blood is tested for HIV, hepatitis B and C, syphilis and different infectious diseases before it can be transfusedto patients.

VI. CONCLUSION

Blood is the primary necessity of life and demand for the healthy blood increasing day by day but finding donators at right time is not a easy job, There are different methods /ways available for searching blood donors but many of them are not user friendly, hectic and yields less or no results many times, This proposed system will be one step ahead from the other blood donation systems. Blood recipient can contact the blood donor directly by using this system .When there is urgent need for blood, it may not be possible for people to connect to the internet to look into the online blood database systems that are already in existence. If people adopt this model, the caller is immediately connected to the donor. Consider a SMS based database system is in which whenever a SMS is send to prospective senders, based on the demand.

REFERENCES

[1] Erraguntla,Madhav,PeterTomasulo,Kevinland,Hany Kamel,Barbee whitaker,"Data Mining to Improve Safety of Blood Donation Process.in System Sciiences(HICSS),2014 47th Hawali International Conference on(pp.789-795).IEEE,2014.

[2] Khan,Javed Akhtar,and M.R Alony ."A New Concept of Blood Bank Management System Using Cloud Computing for Rural Area(INDIA)."International Journal of Electrical ,Electronics and Computer Enginnering,4(1),p.20

[3] Jenipha,T.Hilda,andR.Bachiyalakshmi."Android Blood Donar Life Ssving Application in cloud computing."Biometrics and Bioinformatics6.1(2014):34-36.

[4] Mostafa,Almetwally M.,Ahmed E.Youself,and Gamal Alshorbagy,"A Framework for a smart social blood donation system based on mobile cloud computing .arXiv preprint arxiv:1412.7276(2014).

[5] .BalaSethilMuruga,L.,and Anitha Julian."Design and implementation of automated blood bank using embedded system." Innovations in information Embedded and Communnication systems(ICIIECS),2015 International Conference on(pp.1-6).IEEE(2015).