IOT BASED SMART BLOOD BANK

PROF.ASHWINI K
Asst Prof
Department Of Electronics and Communication
RTE Society's Rural Engineering College Hulkoti
(VTU)
GADAG India
ashwini.kuradagi@gmail.com

PROF.SUGANDA P
Asst Prof
Department Of Electronics and Communication
RTE Society's Rural Engineering College Hulkoti
(VTU)
GADAG India
suganda_p@yahoo.co.in

ABSTRACT

The unit which administers and controls the requisition and dispatching of the blood is termed as blood bank.The main objective of the blood bank is to provide the blood to the patients with minimal blood transfusion error. Blood is very important medical supplies, so it has to be managed well. As the blood bank management consist of the number of manual steps, hence it becomes difficult for the blood banks to provide a high level of accuracy, reliability and automation in blood storage as well as transfusion process. The proposed system will improve the management and response time of the blood bank by connecting all the blood banks to the cloud storage.

KEYWORDS:The blood bank plays very important rolein the blood supply chain hence their major responsibility is to supply blood to meet the risingdemand from the hospitals. The distribution of blood in the correct amount at the correct timeto the correct destination is key to an efficient management of blood supply system. Thereforeit is necessary that blood bank must have a proper administration to minimize blood transfusionarea and blood wastage.

1. INTRODUCTION

Blood is a very important entity in the medical field. There is need of blood form different types of illnesses; the blood is collected from the voluntary donors. Blood or the components of blood are used to treat patients with medical conditions such as anaemia, cancer,blood disorders, and those having surgery. Hence, the blood cannot be evaluated in terms of thecost. Blood is having a moderate life span of about 45 days within prescribed duration have tobe brought in use. Consequently, blood is known to be the most critical element for human life referred as "river of life" so the blood must be managed well to minimize the blood losses.There are four types of blood groups. The blood comprised of the several components such asplasma, platelets etc., depending upon the different diseases the different type of bloodcomponents are given to the patient. Each of these can be used to treat many differentconditions. Among four blood group as A,B,AB and O , the blood group 'O' is known asuniversal Donor because it can be transfused to any person with any Blood group , and the ABblood group is known as the universal acceptor. The blood can be stored for a limited period oftime hence it requires steady and constant collection.In India, for every two second, some person requires the blood transfusion.Therefore, the blood unit required for a year is near about 5 crores but among that only 2.5crore units of blood merely would available for the same. Any healthy adult with a minimumweight of 45KG can donate the blood. Among the total population of India near about 38thousand blood donation required every day. But due to improper management in last 5 years,there was wastage of 28lakh units of blood. Therefore, it is necessary to have proper work inthe blood bank for minimizing the wastage of blood. The blood bank plays very important rolein the blood supply chain hence their major responsibility is to supply blood to meet the risingdemand from the hospitals. The distribution of blood in the correct amount at the correct timeto the

correct destination is key to an efficient management of blood supply system. Thereforeit is necessary that blood bank must have a proper administration to minimize blood transfusionarea and blood wastage.

LITERATURE REVIEW

Blood bank system refers to the process of collecting, separating, and storing theblood, which will later use in blood transfusion process. Blood transfusion is very common;this procedure is used for people of all ages. Many people who have surgery need bloodtransfusions because blood loses during their operations. For example, during heart surgery,one third of the patients have a transfusion. The people who have serious injuries such as fromcar crashes, war, or natural disasters need blood transfusions to replace blood lost during theinjury. It may come as a surprise that due to adequate management practices thousands of literof blood get wasted every day across the country, therefore, there is need of adoption some ofthe best technique for the blood bank. So the adoption of IOT can also become beneficially forthe blood bank to improve the

management system the blood banks. Many authors confirmedabout the beneficiary of Blood Bank management system, therefore many researchers havedeveloped for the blood bank management some of them summarized below.Proposed short message services based blood bank system, it consists of two moduleas data processing module and packet account module. The data processing module respondsthe user request and the packet count module checks the availability ofthe blood samples. Theuser can communicate with the system via SMS whenever inperson required blood then thatperson has to send a request to the system via SMS. Then the system will respond to theserequest and send SMS consisting the address of blood bank which having availability of thebloodstock. If the bloodstock is not available in such case the donor's contact number will besent to the patient.Describes the system based on the RFID and ubiquitous sensor network. The systemhelps to ensure the error-free blood transfusion process. This system is developed anddemonstrated for the continuous report of blood packet temperature and track the location ofblood bags. The LTS unit of the

system a useful way to track the location of moving bloodbanks and time required of the medical staff was reduced. This system makes managing bloodbags simple and reliable.
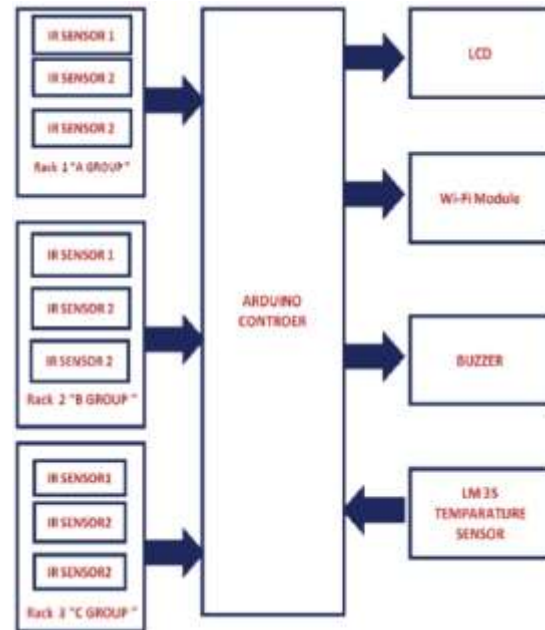

Fig 1. Block Diagram

2. HARDWARE DESIGN

This section is meant for supplying Power to all the sections mentioned above.It basically consists of a Transformer to step down the 230V ac to 12 ac followed bydiodes. Here diodes are used to rectify the ac to dc. After rectification the obtainedrippled dc is filtered using a capacitor Filter. A positive voltage regulator is used toregulate the obtained dc voltage.The power supplies are designed to convert high voltage AC mains electricity toa suitable low voltage supply for electronic circuits and other devices. A power supplycan by broken down into a series of blocks, each of which performs a particularfunction. A DC power supply which maintains the output voltage constant irrespectiveof AC mains fluctuations or load variations is known as "Regulated D.C PowerSupply" For example a
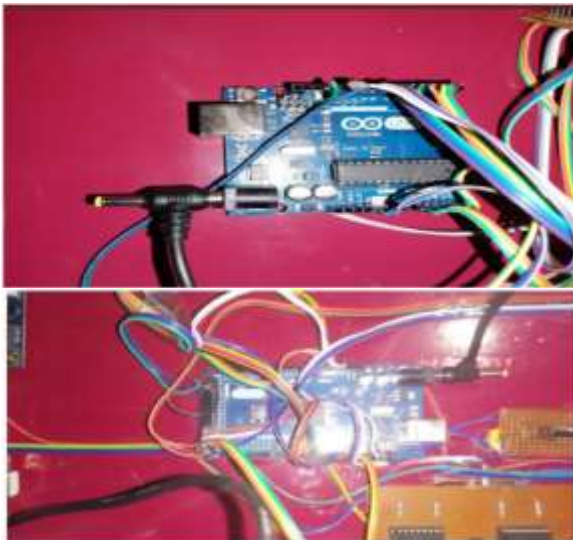
5V regulated power supply system as shown below.

Fig3:Design And Implementation

Fig2:Hardware Design

3. SYSTEM DESIGN AND IMPLEMENTATION

ThingSpeak is an IoT analytics platform service that allows you to aggregate, visualize,and analyze live data streams in the cloud. You can send data to ThingSpeak from your devices,create instant visualizations of live data, and send alerts using web services like Twitter andTwilio. With MATLAB® analytics inside ThingSpeak, you can write and execute MATLABcode to perform preprocessing, visualizations, and analyses. ThingSpeak enables engineers andscientists to prototype and build IoT systems without setting up servers or developing websoftware.
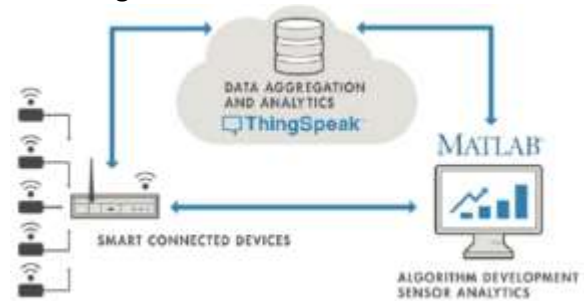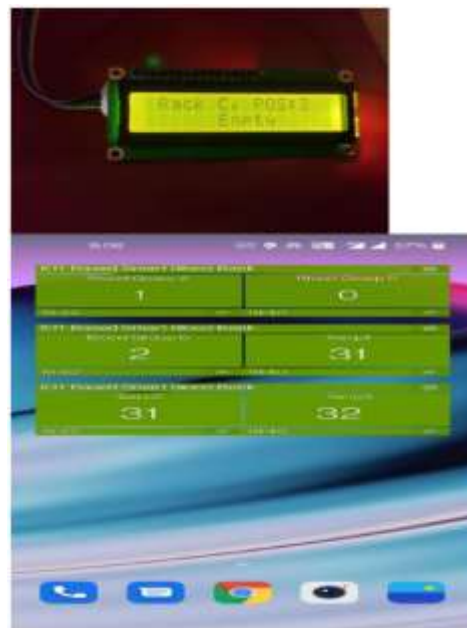
4. SOFTWARE IMPLEMENTATION

SKETCH Embedded C software for programming of IOT module. Dip trace PCB designing software. BLYNK IOT app for mobile.Imagine a prototyping board on your smartphone where you drag and drop buttons, sliders, displays, graphs and other functional widgets. And in a matter of minutes these widgets can control Arduino and get data from it.

RESULT

Providing the required blood to emergency patient.Getting alert Donors.Less time

consumption.Temperature maintenance.Man less Operation.

Fig5:Result

FUTURE SCOPE

There are three different topics related to the Internet of Things concept that has majorfuture scope in terms of improvement and research: efficiency, scalability and quality ofservice. The developed system is prototype version which provides the information about theavailable bloodstock. It consists of an array of IR sensors that covers the minimal area. Tocover large blood packet the IR sensors can be replaced by the load cell. It will cover the largeblood packet and help efficiently to provide information on bloodstock on a real-time basis.Also, one alert system using RFID Tag with smart temperature sensor can be also added to thesystem for indicating the expired blood

packet and its temperature. In the future, this work canbe extended in the context of total blood banks of a country. Big Data analysis can be done onthe gathered data from Region. So that the specific domain names can also be allocated to theblood bank site. Also on the website of blood bank, the login id and passwords can be providedto the blood seekers so that they can be made the online request for the blood units.

CONCLUSION

Growing population has increased the need for the blood supply forvarious diseases. In every two seconds, some person required blood transfusionand currently India facing problem of the blood shortage. To address the probleman effective system is designed using the Internet of things. The system providesa methodology to fulfil the requirement of blood to the patients/victims withoutrushing to the blood bank to know the availability of the blood. An IR Sensorsare connected to the Arduino board which continuously monitors the status of theavailable bloodstock. The output data provided by the Arduino is displayed onthe webpage

using the wifi module so anyone accesses the website and obtainedthe information of available bloodstock in real time. It will reduce the manpowerrequired at the blood bank to update the online data also reduces the efforts ofblood seeker of searching bloodstock at each blood bank. When bloodstockreaches to zero system helps to send a request message to the donor and nearestblood bank. By using IOT the real-time available bloodstock is displaying on thewebsite it minimizes the efforts of blood seeker.

REFERENCE

[1] J. S. Lee, Y. W. Su, and C. C. Shen, "A comparative study of wireless protocols:Bluetooth,UWB, ZigBee and Wi-Fi," in Proc. IEEE 33rd Annu. Conf.IECON, pp.46-51, Nov. 2007

[2] Ala Al-Fuqaha, Mohsen Guizani, Mehdi Mohammadi, Mohammed Aledhari,and MoussaAyyash, "Internet of Things: A Survey on Enabling Technologies,Protocols, and Applications"IEEE Communication Surveys

Tutorials, Vol.17, No. 4, Fourth Quarter 2015,pp. 2347-2377.

[3] G. Muddu Krishna; S. Nagaraju(2016), "Design and implementation of short messageservice (SMS) based blood bank", 2016 International Conference on Inventive ComputationTechnologies (ICICT)

[4] Do-Sung Kim, Sun K. Yoo, HO Kim, BC Chang ,HS Bae , SJ Kim(2007), "Location BasedBlood Bag Management using active RFID and Ubiquitous Sensor Network" ,6th InternationalSpecial Topic Conference on ITAB, 2007, Tokyo

[5] WijaiBoonyanusith; PhongchaiJittamai (2010), "The Development of Web-Based Systemfor Blood Requisition within Blood Supply Chain", 2010 Seventh International Conference onInformation Technology: New Generations

[6] Muhammad Arif; S. Sreevas; K. Nafseer; R. Rahul(2012) "Automated online Blood bankdatabase", 2012 Annual IEEE India Conference (INDICON)

[7] Adarsh N, Arpitha J, Md. Danish Ali, Mahesh Charan N, Pramodini G Mahendrakar (2014),"Effective Blood Bank Management Based On RFID in Real Time Systems", InternationalConference on Embedded Systems - (ICES 2014)

[8] Anish Hamlin M R, Albert Mayan J (2016), "Blood Donation And Life Saver-BloodDonation App", 2016 International Conference on Control, Instrumentation, Communicationand Computational Technologies (ICCICCT)