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## A SURVEY ON IMPLEMENTATION OF SMS (SHORT MESSAGING SERVICE) BASED AUTOMATED BLOOD BANK USING RASPBERRY PI FOR RURAL AREAS

MISS. POOJA A. TAYWADE<sup>1</sup>, PROF. AJAY P. THAKARE<sup>2</sup>

1. M.E. -2ND Year, Department of Electronics and Telecommunication Sipna College of Engineering and Technology, Amravati, Maharashtra, India.
2. Professor and Head, Department of Electronics and Telecommunication Sipna College of Engineering and Technology, Amravati, Maharashtra, India.

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**Abstract-** A blood bank is a bank of blood or blood components, gathered as a result of blood donation or collection, stored and preserved for later use in blood transfusion. 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" is a division of a hospital where the storage of blood product occurs and where proper testing is performed. Automated Blood Bank tries to assist victims/patients/those in want of blood. The mission is to fulfil every blood request in the rural areas with a promising SMS application and motivated individuals who are willing to donate blood. In this paper, 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 kit. Entire communication takes place via SMS (Short Messaging Service) which is compatible among all mobile types. "Implementation of SMS based Automated Blood Bank using Raspberry Pi for rural areas" is a project that brings voluntary blood donors and those in need of blood on to a common platform. The proposed work explores to find blood donors by using GSM based Smart Card. CPU-Raspberry Pi. The vision is to be "The hope of every Indian in search of a voluntary blood donor". With the help of this new concept we also develop the facilities of blood bank management system in the rural area.

**Keywords:** Raspberry Pi 2, Blood bank, Blood donors, Blood acceptors.



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Corresponding Author: MISS. POOJA A. TAYWADE

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**INTRODUCTION**

Human blood is meagre, valuable and much in demand. Every year the nation requires about 4 Crore units of blood. But out of which only a meager 40 Lakh units of blood are obtainable. Blood donation is one of the most significant contribution that a person can make towards the society. It is not harmful for an adult person to donate blood. The body of the donor can regenerate the blood within few days. It poses no threat to the metabolism of the body. The patient needs blood or his or her group of blood whenever necessary. It is another important thing. Blood has four groups. These blood groups are A, B, AB and O.

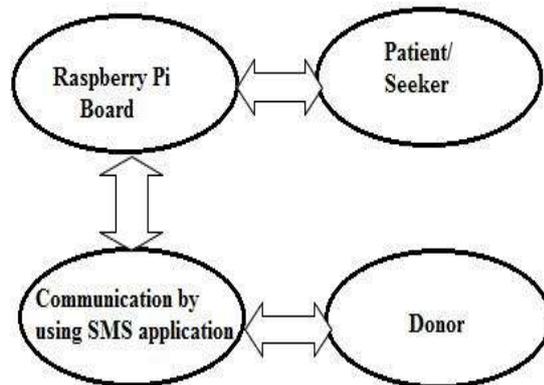
Following chart gives more information about these blood groups.

		You Can Receive						
If Your Type Is	O-	O+	B-	B+	A-	A+	AB-	AB+
AB+	YES	YES	YES	YES	YES	YES	YES	YES
AB-	YES		YES		YES	YES		
A+	YES	YES			YES	YES		
A-	YES				YES			
B+	YES	YES	YES	YES				
B-	YES		YES					
O+	YES	YES						
O-	YES							

The man with the O-group blood is called the universal donor as the people having others can accept it. On the contrary, the man with AB group of blood is called the universal receiver as he can accept all groups of blood. Blood can be stored for a limited period of time that is why the blood banks need a steady and constant collection. There are multiple blood banks around the India, however none of them offer the capability for a direct contact between the donor and recipient. This is often 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 2 kit. 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.

Fig. shows basic idea of the system.



Every two seconds somebody desires blood. More than thirty eight thousand blood donations area unit required a day. A More than one million new individuals are unit diagnosed with cancer annually. Several of them can would need blood, typically daily, throughout their therapy treatment. One automotive accident victim will need as several as hundred units of blood. All the on top of wants is met by the planned work. With the help of this new concept we also improve the facilities of blood bank management system in the rural area.

Terminology used in blood bank management system as follow:

Blood donors: Person who wants to donate the blood.

Seekers (patient): Person who wants the blood from the blood bank due to various reasons like accidents, surgeries, delivery and many.

Blood bank: staff people which are working in the blood bank which includes staff member, operator, blood bank in charge, head of pathological department.

## LITERATURE REVIEW

Blood banks are laboratory centres that are responsible for the collection, processing, typing, safety and storage of blood for research and medical purposes. Automated blood bank system plays a vital role in the blood bank as blood is the necessity of everyone. Many authors discuss about the beneficiaries of the blood bank management information system. Many researchers have developed the blood bank management information system. Some of them are summarized below.

Javed Akhtar Khan and M.R. Alony[1] used concept of Cloud Computing which is on demand Services. In this research paper they introduce mobile SMS based blood bank management system for rural area which is direct connect to cloud server located in other location. Because in rural area blood bank management system not have a sufficient facilities for storing a blood in long time. They collect some of information about the blood

bank management system located in city and rural area. In this project blood bank staff has authorized access permission to cloud computing as a highly available computing environment where secure services and data are delivered on-demand to authenticated devices. Currently there are three primary categories of cloud computing service:

Infrastructure as a service (IaaS): Computing infrastructure, such as servers, storage, and network, delivered as a cloud service, typically through virtualization.

Platform as a service (PaaS): Platforms that can be used to develop and deploy applications.

Software as a service (SaaS): Software deployed as a hosted service and accessed over the Internet.

Anitha Julian and Bala Senthil Murugan [2] proposed 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 fulfill every blood request in the country with a promising android application and motivated individuals

Who are willing to donate Blood. The proposed work aims at servicing the persons who seek donors who are willing to donate blood and also provide it in the time frame required.

Kieran Healy, Princeton University [7] proposed article which is a comparative study of blood collection regimes in Europe. Regimes are found to affect donation rates and donor profiles. When the Red Cross collects blood, donation is tied to religious activity and other volunteering, unlike state and blood bank systems. The analysis contributes to an institutional perspective on altruism and highlights the need to attend to the socially embedded nature of altruistic as well as self-interested action.

Blood bank management system using unified process methodology presents a complete blood bank management information system. The analysis and design of the blood bank management information system has been done using Unified Modeling Language (UML). It is a language for visualizing, specifying constructing, documenting the artifacts of a software intensive system as well as other non-software systems. Implementation has been done using Model View Controller (MVC) architecture and Microsoft Visual Studio. Database server is used which is NET framework and Oracle 8i. Another blood donation system in java is designed for blood bank management system. It is planned to collect blood from many donators in short from various sources and distribute that blood to needy people. The basic need is to provide blood donation service to the city and major task of blood bank system is to provide blood to help people. This blood bank system project uses asp.net project which manages all kind of information related to blood. The blood bank system project contain information related to blood like blood bank, date of donation of blood, validity of blood, available blood group. At any point of time the people who are in need of blood can reach the donors through this search facility.

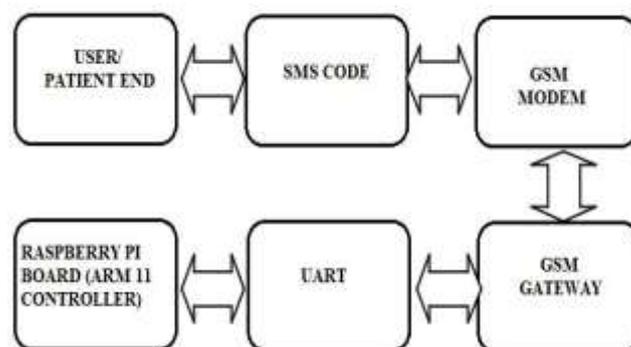
Clemen Teena, K. Sankar and S. Kannan[12] provides reliable security measures, which protect data and the package from accidental or deliberate threats that could cause unauthorized modifications, disclosures or destruction of the data and protection of the information system by the use of password. It provides an automated registration of donor code for each type of blood, thus, storing information on the system rather than using bulky files. Set up forms records all the information of blood category and its donor, recipient and quantity etc. Here we can add edit and search records information according to need.

### III. PROPOSED WORK

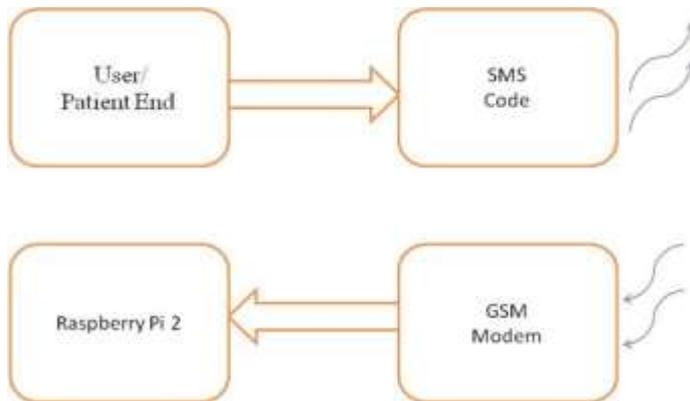
Automated Blood Bank brings blood donors and those in need of blood on to a common platform. Through this application, individuals look for donors who are willing to gift blood, furthermore as give the timeliest support to those in frantic want of it. The mission is to fulfil every blood request in the 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 slogan is "Donate blood to save the most precious human life".

The proposed work explores to find blood donors by using GSM based Smart Card CPU Raspberry Pi 2 Kit. It will run many flavours of UNIX operating system. If the user plugs the Raspberry Pi 2 into HDTV, people could watch Blue Ray quality video. The raspberry pi 2 model also has a 10/100 Ethernet port so the user can surf the web (or serve web pages) from wherever they are using the Pi. The system volume no longer lives on an SD card but instead micro SD cards, so it is even easier to organize, run and rectify many totally different operating systems on an equivalent hardware.

Figure shows overall system architecture.



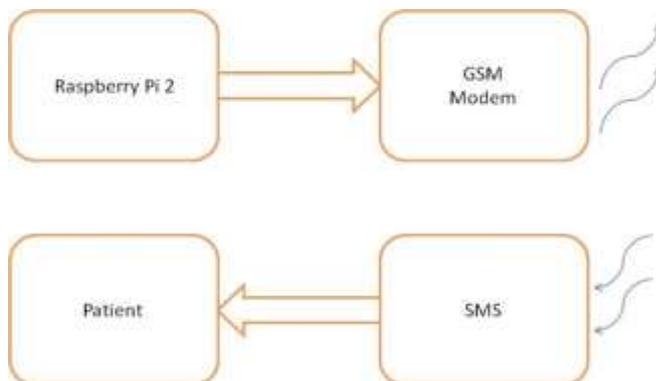
Requirement of patient/donor:



**Fig. Block diagram of patient requirement**

In this, blood donors (user) or patients in need of blood can send a SMS (Short Messaging Service) to a specific number which includes particular syntax for sending SMS. This SMS is received through GSM in a raspberry pi and then fetching is done by using raspberry pi 2 via UART.

Acknowledgement from raspberry pi 2:



**Fig. Block diagram of raspberry pi 2 acknowledgement**

On the other hand, it is stored in Raspberry Pi 2 and according to that SMS it checks availability. Finally reply is send through GSM on that same number according to requirements of user/patient.

#### IV. CONCLUSION

Most of the blood donors are unpaid volunteers who donate blood for a community supply. In poorer area, supply of blood is limited and donors usually give blood when family or friends require a transfusion (directed donation). This paper shows the new working concept of blood bank management system especially for rural area. Information and mobile technology is very famous in blood banks for its potentials in working efficiency as well as service quality. It plays a very important role in this new concept. With the help of this new concept automated blood banks have to provide a blood to any time and any situation to the seeker.

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