

# Online Blood Bank System Using Blockchain Technology

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**Abstract:** The number of persons who are in need of blood are increasing in large number day by day. In order to help people who are in need of blood, Online Blood Bank can be used effectively for getting the details of blood donors having the same blood group and within the same city. With the help of Online Blood Bank people who are having the thought of donating blood gets registered in Online Blood Bank giving his total details. Online Blood Bank site is available to everyone easily. A person who likes to donate blood gives his entire details i.e., fill in the registration form and can create a username with a password by which he can modify his details if at all there are any changes in his information given before. site also helps people who are in need of blood by giving the details of the donors by searching, if at all there are no donors having the same group and within their own city they will be given the addresses with phone numbers of some contact persons in major cities who represent a club or an organization with free of cost. If at all the people find any difficulty in getting blood from the contact persons we will give them a Mobile link i.e., India's Largest Paging Service number through which they can give the message on every ones pagers with the blood group and city they are living in, such that the donors who view the messages in their pagers having the same blood group and the in the same city or any other city, he contacts the person on phone who are in need of a blood. Such that the person gets help from us which saves his life. My contribution work is provide security using block chain Technology.

**Keywords:** Block Chain, bit coin, blood bank, online system, Security.

## I. Introduction

A blood donation is a process whereby a person voluntarily has blood to be used for future transfusions when in need at hospitals for treatment procedures that require them. Donation may be of whole blood (blood drawn directly from the body) or of specific components of the blood; such as red blood cells, white blood cells, plasma, and platelets. Blood banks often participate in the process of collecting blood and other procedures such as managing stocks, approving blood requests and updating donation information. The inspiration of this project is to improve blood banks and to develop a blood bank information system which focuses on making an online system that is accessible for donors, seekers and administrators. Donors can directly receive information regarding their previous blood donations, including their blood results and donation history, in order to easily schedule their next donations. They can also update the personal information through the system, without having to contact the blood bank registry. The system is also developed for the administrators, who are the main authority in the system. Administrators can add, modify, delete, and query any donation information if necessary. The administrator is also responsible for responding to the hospital's blood requests and checking the stocks in the blood bank's inventory.

## II. Problem Statement

To build a system in persons who like to donate blood registers in system as well as he can modify the details if necessary, giving the Login Id and Password. The persons in need of blood searches for the persons having the same blood group and within the city. If he found a donor in his city then he gets the total details of the donor. We also implement block chain for security; store all data in block chain nodes.

## III. Motivation

- ❖ The Motivation of the blood bank management system is to simplify and automate the process of searching for blood in case of emergency and maintain the records of blood donors, recipients, blood donation programs and blood stocks in the bank.
- ❖ Security is main issue in such systems.

## IV. Objectives

- ❖ To develop a system that provides functions to support donors to view and manage their information conveniently.
- ❖ To maintain records of blood donors, blood donation information and blood stocks in a block chain technology system.
- ❖ To inform donors of their blood result after their donation.
- ❖ To support searching, matching and requesting for blood convenient for administrators.
- ❖ To provide a function to send an e-mail directly to the donor for their user account and the seeker, the availability of the blood bag.

## V. Literature Review

In this section, we briefly review the related work on mental sickness detection system and their different techniques.

This paper [1] creating cloud-based blood bank system is to make the blood available on time to the people, even in emergency situations. With the help of this project, the user can be able to view information about every entity related to blood bank i.e.

hospitals, donors, a location of another blood bank etc. A disadvantage is the security factor not maintained properly and used private cloud.

In this paper [2], we conceptualize a block chain-based decentralized framework for crowd sourcing named Crowd, in which a requester's task can be solved by a crowd of workers without relying on any third trusted institution, users' privacy can be guaranteed and only low transaction fees are required. In particular, we introduce the architecture of our proposed framework, based on which we give a concrete scheme. We further implement a software prototype on Ethereum public test network with real-world dataset. Experiment results show the feasibility, usability and scalability of our proposed crowd sourcing system.

The proposed work [3] 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.

The aim of this system [4] is to fulfil every blood request by using android application and raspberry pi. In the proposed system, data about the donors will be collected by using android application and raspberry pi by installing systems at places such as hospitals, blood banks etc. These data will be stored in the database. User/Patients needs to access application and needs to enter his requirements about the blood in the application the requirements are matched with the database and message will be to that particular blood donor through GSM modem.

## VI. Proposed Approach

The proposed system, Online Blood Bank site overcomes the drawbacks of the present system using block chain technology. The Blood Bank helps the people who are in need of a blood by giving them overall details regarding the donors with the same blood group and within their city. Provide security to these data using block chain technology.

The advantages of the proposed system are listed below.

- ❖ The people in need of blood can search for the donors by giving their blood group and city name.
- ❖ It is very flexible and user friendly.
- ❖ The person's time and work is reduced very much which prevails in the present system.
- ❖ Easy and Helpful.

## VII. System Diagram

A lot of work has been done in this field thanks to its extensive use and applications. This section mentions some of the approaches that have been implemented to achieve the same purpose. These works are mainly differentiated from the technique for online blood bank systems.

At present, the public can only know about the blood donation events through conventional media means such as radio, newspaper or television advertisements. The Existing system that is using by the blood bank is manual system with the manual system, there are problems in managing the donors' records. The records of the donor might not be kept safely and there might be missing of donor's records due to human error or disasters. There is no decentralized database of volunteer donors. So, it becomes really tedious for a person to search blood in case of emergency. The only option is to manually search and match donors and then make phone calls to every donor. In existing system not secure.

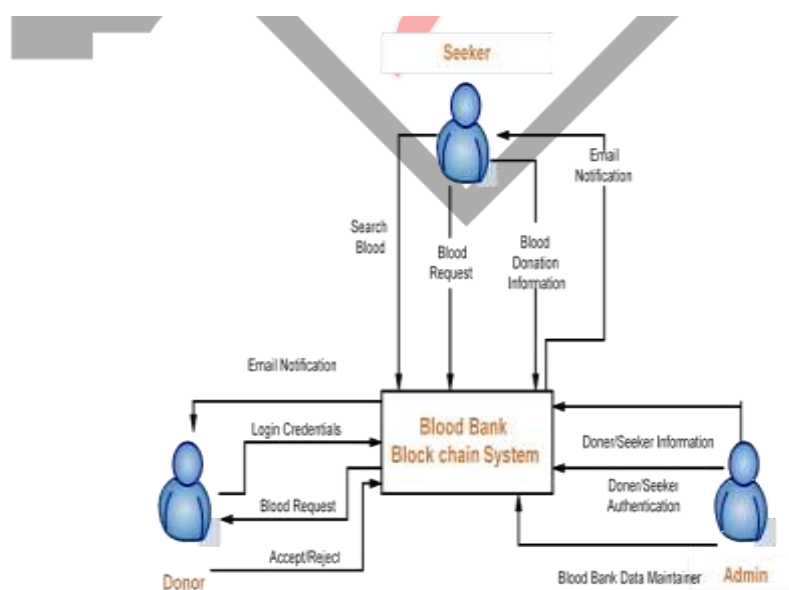


Figure 3.1: System Architecture

*Algorithm:*

### 1. AES Algorithm for Encryption.

AES (advanced encryption standard).It is symmetric algorithm. It used to convert plain text into cipher text .The need for coming with this algo is weakness in DES. The 56 bit key of des is no longer safe against attacks based on exhaustive key searches and 64-bit block also consider asweak.AES was to be used128-bit block with128-bit keys.

Rijndael was founder. In this drop we are using it to encrypt the data owner file.

#### Input:

128\_bit /192 bit/256 bit input (0, 1)

Secret key (128\_bit) +plain text (128\_bit).

#### Process:

10/12/14-rounds for-128\_bit /192 bit/256 bit input

Xor state block (i/p)

Final round: 10, 12, 14

Each round consists: sub byte, shift byte, mix columns, add round key.

#### Output:

Cipher text (128 bit)

### IX. Experimental Setup

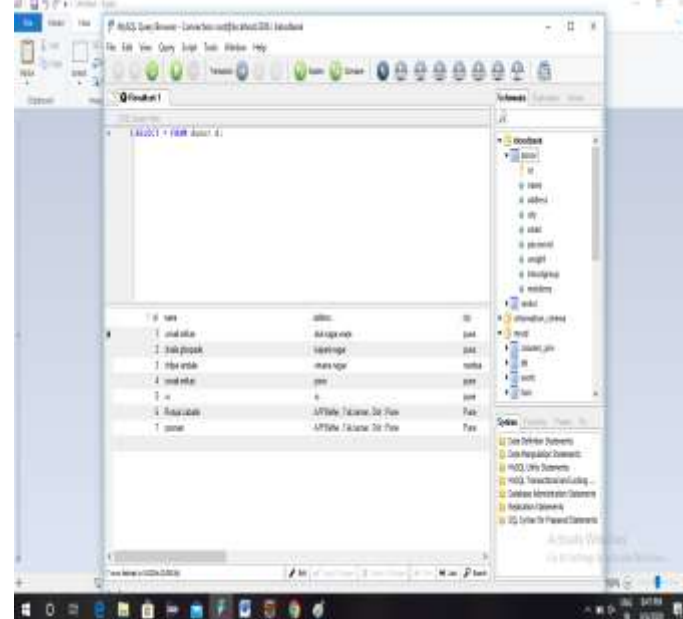
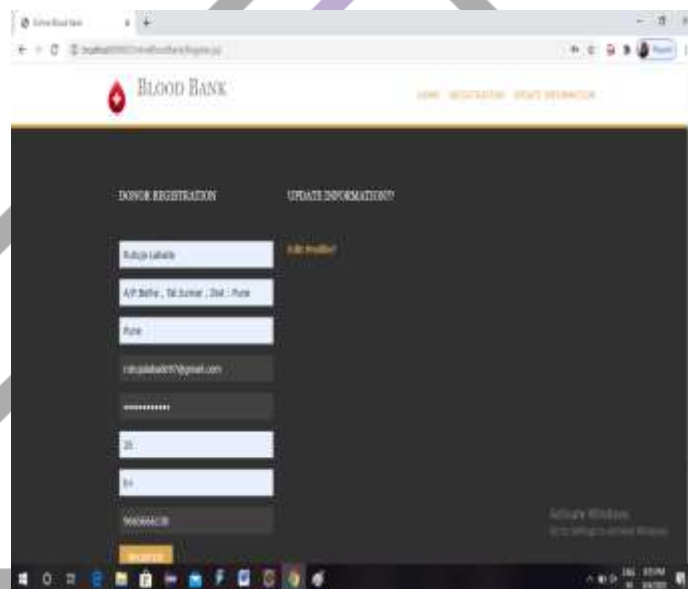
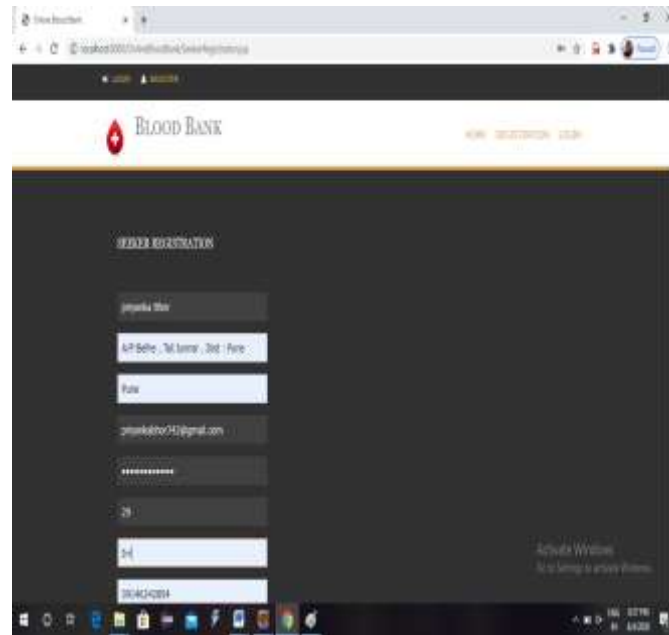
Experiments are done by a personal computer with a configuration: Intel (R) Core (TM) i3-2120 CPU @ 3.30GHz, 4GB memory, Windows 7, MySQL 5.1 backend database and Jdk 1.8. The application is web application used tool for design code in Eclipse and execute on Tomcat server.

### X. Screenshots

### XI. Conclusion

This paper proposed the reliable online blood bank system using block chain technology. Latest technology and information system plays a vital role in blood bank system and its services, as its quality improves. The system is beneficial for both seeker and donor too. Due to this System, the bridge between donor and the seeker is reduced and their Communication improves .





**References:**

- [1] N. Szabo. (1996). Smart Contracts: Building Blocks for Digital Markets. [Online]. Available: [http://www.fon.hum.uva.nl/rob/Courses/Information-InSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart\\_contracts\\_2.html](http://www.fon.hum.uva.nl/rob/Courses/Information-InSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart_contracts_2.html)
- [2] N. Szabo. (1997). The Idea of Smart Contracts. [Online]. Available: <http://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/idea.html>
- [3] J. Stark. (2016). Making Sense of Blockchain Smart Contracts. [Online]. Available: <https://www.coindesk.com/making-sense-smart-contracts/>
- [4] S. Nakamoto. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System. [Online]. Available: <https://bitcoin.org/bitcoin.pdf>
- [5] Y. Yuan and F.-Y. Wang, "Blockchain and cryptocurrencies: Model, techniques, and applications," *IEEE Trans. Syst., Man, Cybern., Syst.*, vol. 48, no. 9, pp. 1421–1428, Sep. 2018.
- [6] X. Xu et al., "The blockchain as a software connector," in *Proc. 13th Working IEEE/IFIP Conf. Softw. Archit. (WICSA)*, 2016, pp. 182–191.
- [7] Ethereum Yellow Paper. (2018). [Online]. Available: <https://ethereum.github.io/yellowpaper/paper.pdf>
- [8] K. Bhargavan et al., "Formal verification of smart contracts: Short paper," in *Proc. ACM Workshop Program. Lang. Anal. Security (PLAS)*, Vienna, Austria, Oct. 2016, pp. 91–96.
- [9] M. Risius and K. Spohrer, "A blockchain research framework: What we (don't) know, where we go from here, and how we will get there," *Bus. Inf. Syst. Eng.*, vol. 59, no. 6, pp. 385–409, 2017.
- [10] X. Xu et al., "A taxonomy of blockchain-based systems for architecture design," in *Proc. IEEE Int. Conf. Softw. Archit. (ICSA)*, 2017, pp. 243–252.
- [11] F. Glaser, "Pervasive decentralisation of digital infrastructures: A framework for blockchain enabled system and use case analysis," in *Proc. 50th Hawaii Int. Conf. Syst. Sci.*, 2017, pp. 1543–1552.
- [12] L. Luu, D. H. Chu, H. Olickel, P. Saxena, and A. Hobor, "Making smart contracts smarter," in *Proc. ACM SIGSAC Conf. Comput. Commun. Security (CCS)*, Vienna, Austria, Oct. 2016, pp. 254–269.
- [13] D. S. Modha et al., "Cognitive computing," *Commun. ACM*, vol. 54, no. 8, pp. 62–71, 2011.
- [14] L. P. Kaelbling, M. L. Littman, and A. W. Moore, "Reinforcement learning: A survey," *J. Artif. Intell. Res.*, vol. 4, pp. 237–285, May 1996.
- [15] M. Georgeff, B. Pell, M. Pollack, M. Tambe, and M. Wooldridge, "The belief-desire-intention model of agency," in *Proc. Int. Workshop Agent Theories Archit. Lang.*, 1998, pp. 1–10.
- [16] What is a DAO? Accessed: Oct. 17, 2018. [Online]. Available: <https://blockchainhub.net/dao-decentralized-autonomous-organization/>
- [17] L. Lotti, "Contemporary art, capitalization and the blockchain: On the autonomy and automation of art's value," *Finance Soc.*, vol. 2, no. 2, pp. 96–110, 2016.
- [18] A. Dika, "Ethereum smart contracts: Security vulnerabilities and security tools," M.S. thesis, Dept. Comput. Sci., Norwegian Univ. Sci. Technol., Trondheim, Norway, 2017.
- [19] Javed Akhtar Khan and M.R. Alony, "A New Concept of Blood Bank Management System using Cloud Computing for Rural Area," *International Journal of Electrical, Electronics ISSN No. (Online): 2277-2626 and Computer Engineering* 4(1): 2026(2015).
- [20] T.Hilda Jenipha and R.Backiyalakshmi, "Android Blood Donor Life Saving Application in Cloud Computing," *American Journal of Engineering Research (AJER)* 2014.
- [21] Sagar Shrinivas, Vasaikar Vijay and Suresh Yennam, "Online Blood Bank Using Cloud Computing," *International Journal of Advanced Research, Ideas and Innovation In Technology*,(volume 3, Issue 1)
- [22] P. Priya, V. Saranya, S. Shabana and Kavitha Subramani, "The Optimization of Blood Donor Information and Management System by Technopedia," *International Journal of Innovative Research in Science, Engineering and Technology An ISO 3297: 2007 Certified*.