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# Maintaining Security and Achieving Transparency in Charities

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**Abstract:** While analyzing the problem we thought about the importance with respect to data security. Since everything is getting digitalized, security is the key point in this digital era. So, when it comes to data security or data integrity, there are several ways through which we can achieve this. So, we started finding loop holes in digitize donation system. As this way we came on the conclusion that there are loop holes in the charity system. Hence, we have decided to use the most spectacular data security related technology i.e., “blockchain”. We are going to implement blockchain technology in this proposed system, so that whatever transaction / donation done between donor and beneficiary will be transparent and open to world. which will ultimately reduce chances of corruptions usually happen in the donation system.

## I. INTRODUCTION

We started finding loop holes in digitize donation system. In this way we came to the conclusion that there are loop holes in the charity system.

Hence, we have decided to use the most spectacular data security related technology i.e., “blockchain”. We are going to implement blockchain technology in this proposed system, so that whatever transaction / donation done between donor and beneficiary will be transparent and open to world. Blockchain is the world's leading software platform for digital assets and it plays a lead role in cryptocurrency market. It is very easy to transfer money overseas. Which will ultimately reduce chances of corruptions happen in the donation system.

The charity system mode proposed the use of blockchain technology to solve problems in social emergency assistance. also analysed the application of blockchain technology in India's philanthropy and affirmed the advantages of blockchain technology in philanthropy. Blockchain technology proposed to manage the assistance funds in disaster area and establish the entire platform on Ethereum.

The blockchain system can bring transparency to online charity trusts. Contributors can see the journey of the donation in real time and confirm if it's reaching the deserving hands or not. With the addition of blockchain into charities, donors would no longer be unaware of what's being done with their money. donation information would be stored in blocks

Important aspects of a system are as follows:

- 1) **Donor:** In this module, user can register in our system as a donor using credentials and unique wallet address where he can view the campaigns and their details. And after selecting project for donation, he/she proceed for donation. The system will check the balance of donor's account. Donation can be complete if balance is sufficient.
- 2) **Beneficiary:** The people who need help should fill the information which will be uploaded to the charity organization for review, and the approved projects will be posted on the charity platform. In this module, user can register in system as a beneficiary using credentials and unique wallet address. After registration beneficiary can create campaigns with their details such as images, goals, required amount, duration. beneficiary can view all transactions related to campaigns. Beneficiary can get report of their own campaigns in which he/she will get information related to donated amount and their information
- 3) **Charity Organization:** The organization can get donation from the platforms to help other people. also, it will check the forms filled by the beneficiary. If all details are founded true then only campaigns display on web page otherwise it can't.
- 4) **Issue Token Module:** In this module, donor can request for the ERC20 token for donation purpose. While requesting for the tokens donor needs to pay as per the exchange of token rate to the system through online payment/ UPI. After requesting for the token's admin will view the request and then issue the tokens after confirming the payment done by the donor.

- 5) **Infura Module:** Infura is a hosted Ethereum node cluster that lets you make request to the ETH-1 blockchain without requiring you to setup your own ETH-1 node. Infura is a blockchain development suite that provides application programming interfaces (APIs) and developer tools. It accesses to the Ethereum network to enable developers to build sophisticated next generation software and Web3 applications that scale to meet user demand. Infura offers top of-the-range documentation and resources to help developers build decentralized applications (Dapp) quickly. It provides the tools and infrastructure that allow developers to easily take their block-chain application from testing to scaled deployment.
- 6) **Meta-Mask Module:** Meta mask is a browser extension/ app design to make accessing Ethereum Dapp ecosystem easier. It also surfs as a wallet for holding ERC-20 tokens allowing users to access services built on the network via the wallet. In our project we used meta mask extension/ app for managing user's private keys securely. It provides features like accessing multiple accounts at one place which we can use in mobile devices also with browser extension. The meta mask supports multiple networks like Ethereum, BSC, polygon, Matic.

## II. LITERATURE REVIEW

- 1) Research on Charity System Based on Blockchain. Hangzhou Institute of Service Engineering, Hangzhou Normal University, Hangzhou, author- hu- baokun (2020). The charity organizations in India having lack of transparency. and supervision to them is difficult to achieve, which has a negative impact on the willingness of the people to donate. Block-chain as an underlying technology of Bitcoin system provides a new solution for the charity system in terms of technology. This paper proposed a charity system based on blockchain technology and ex-pounds the design pattern, architecture and operational process of the platform. Some core functions of the charity platform have been realized and verified on Ethereum. We hope to increase the transparency of charities to enhance the people trust in charities and promote the development philanthropy by blockchain-based charity system.
- 2) Research on Bitcoin: A Peer-to-Peer Electronic Cash System. Author: Satoshi Nakamoto (2008). Before implementing blockchain into our project, we first need to understand how blockchain works, how it is implemented onto the network. A purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial organization. This paper proposed a peer- to-peer electronic cash transaction through blockchain. Which we will be using in our respected project for the transaction purpose. Digital signatures provide part of the solution, but the main benefits are lost if a trusted third party is still required to prevent double-spending. We propose a solution to the double-spending problem using a peer-to-peer network. The network timestamps transactions by hashing them into an ongoing chain of hash-based proof-of-work, forming a record that cannot be changed without redoing the proof-of- work.
- 3) Developing a Reliable Service System of Charity Donation During the Covid-19 Outbreak. HANYANG WU 1,2 AND XIANCHEN ZHU 1 1School of Economics and Management, Nanjing University of Science and Technology, Nanjing 210094, China 2School of Economics and Management, Jilin Institute of Chemical Technology (2020). Resisting major disasters has become a common global topic, and strengthening the governance of them is an essential field of charity. All countries attach importance to strengthening close cooperation between the public and private sectors, various non-governmental organizations and scientific research institutions, and have formed a multi-party cooperation mechanism for disaster relief and disaster reduction. A charity donation can quickly organize work on disaster relief, which is an essential part of social forces in such a situation. Blockchain technology is to provide decentralized ledgers whose distribution is in the form of cryptography in chronological order. Each block is a linked data structure in the form of a linked list. The data in the block cannot be tampered but can be verified in the system, and they can be stored safely in a sequential relationship. Data are distributed through an extensive, distributed, and incorruptible network of computers.
- 4) Blockchain smart contracts: Applications, challenges, and future trends. Author: Shafaq Naheed Khan<sup>1</sup> · Faiza Louki<sup>2</sup> · Chirine Ghedira-Guegan<sup>3</sup> · Elhadj Benkhelifa<sup>4</sup> · Anoud Bani-Han (2021). In recent years, the rapid development of blockchain technology and cryptocurrencies has influenced the financial industry by creating a new crypto-economy. Then, next-generation decentralized applications without involving a trusted third-party have emerged this is due to appearance of smart contracts, which are computer protocols designed to facilitate, verify, and enforce automatically the negotiation and agreement among multiple untrustworthy parties. Despite the bright side of smart contracts, several concerns continue to undermine their adoption, such as security threats, vulnerabilities, and legal issues. Here, we found comprehensive survey of blockchain-enabled smart contracts from both technical and usage points of view. we identify a set of challenges and open issues that need to be addressed in future studies. Finally, we identify future trends.



- 5) Managing charity 4.0 with Block- chain: a case study at the time of Covid- 19.University G. D'Annunzio of Chieti- Pescara, Viale Pindaro, 42, 65127 Pe-scara, Italy. Corresponding author: Adalberto Ragone. The Covid-19 emergency is demonstrating the need to follow new solutions that can support the important role played by non- profit organizations around the world. Contrary to what should have happened to further combat the effect of pandemic, the majority of philanthropic organisations had a negative impact on fundraising, suf- fering a substantial decrease. Today, theBlockchain can play a pivotal role to re- establish pre-pandemic standards and en- hance the development of global philan- thropy. The available literature provides countless insights that can allow us to in- vestigate the evolutionary trends and the quality of the flows of donations to non- profit entities over time and under numer- ous perspectives. Authors such as James, Mainardes et al. Bakers and Wiekping provided important studies on donationsflows by analyzing qualitative and quanti- tative as well as social aspects. Some au- thors instead pleaded an approach relatedto psychological principles, often due tothe evidence of donations already made or the empathy of donors and the emotions aroused. Nevertheless, in the context of the literature review, in our opinion some analyses emerged more than other. They clarify the close correlation between the legitimization factor. the ability to create serious and efficient donation models aswell as the reputation of non-profit organi- zations and an increase in donations.
- 6) Review of Distributed Ledgers: The technological Advances behind crypto- currency. Author: Suvarna K. KadamDepartment of Computer Engineering, D. Y. Patil College of Engineering Akurdi (2018). Blockchain and related Distributed Ledger Technologies (DLT) are proving to be the ground breaking and likely to change the role of web from centralized document sharing platform to a generic de- centralized platform that can exchanged digital currency and help autonomously manage financial and real-estate assets. Distributed Ledger Technology (DLT) are one of key technologies responsible for bringing the openness of web back without compromising its security. The commer- cial and legal transactions can now be handled completely on the web as DLTs provide more secure and accountable envi-ronment for exchanging digital assets inthe forms of currencies, popularly known as cryptocurrency. The paper reviews the recent advances in DLTs. And also, the recent cryptocurrencies along with the re- lated distributed ledger technology (DLT) employed to realize that cryptocurrency is discussed. The review concludes with im- pact of DLT on the future of the Web.
- 7) An Overview of Smart Contract and Use cases in Blockchain Technology. Author: Bhabendu Kumar Mahanta, Soumya Shree S Panda, Debasish Jena IIT Bhubaneswar Odisha, India (2018). In the last decade blockchain technology become mainstream research topic because of its decentralized, peer to peer transac- tion, distributed consensus, and anonymity properties. The blockchain technology overshadows regulatory problem and tech- nical challenges. A smart contract is a computer program having self-verifying, self-executing, tamper-resistant properties. The smart contract concept was proposed by Nick Szabo in 1994. It allows executing code without the third parties. A smart contract consists of the value, address, functions, and state. It takes transaction as an input, executes the corresponding code and triggers the output events. Depending upon the function logic implementation states are changes. Since 2008 when blockchain technology come into existence through Bitcoin cryptocurrency. The im- portance of smart contract integration of blockchain technology become a focus area to develop because it gives peer to peer transaction and database can be maintained publicly in a secure way in a trustful envi- ronment. Smart contracts are trackable and irreversible. All the transaction infor- mation is present in a smart contract and it executes automatically. The programming language Solidity is used to implement the smart contract in various blockchain plat- forms.
- 8) A block chain based decentralized exchange. Author: Harsh Patel. A pure peer to peer version of the ex- change system would allow all parties ac- cess to the market without relying on any central organization for market access. Pa- per proposes a solution for the problem of maintain an order book and determine the execution rate in the peer-to-peer network. Like cryptocurrencies the network relies on blockchain of transaction. Digital signa- ture system would be the core of the de- centralized market place. The paper de- fines basic ground rules for the working of decentralized exchange. The major components of the decentralized exchange are issuing process, co-existence of blockchain and order books and functions of the miner. Unlike other crypto currencies de- centralized exchange would have a trust- based issuing process which in long run would be a sum zero game. The decentral- ized Exchange would have 3 types of enti- ties namely – Issuer, Trader and Miner. Were issuer being the entity who is the ini- tial starting point for the decentralized ex- change, trader is the entity that places the order to either buy / sell a defined quantity, and miners are entities who constantly lis- ten to the network for successful transac- tion broadcasted by the nodes.
- 9) A Study of Private Donation System Based on Blockchain for Transparency and Privacy. Author: junho jeong [Sci- ence and Engineering Kongju National University, Cheonan, Rep. of Korea] (2020). Nowadays, social inequality is an im- portant social problem. Donations are one of the many ways to improve social ine- quality. Donation is largely divided into sponsorship by individuals such as corpo- rations and public administration. In the individual sponsorship, it is common to donate to a donation

organization and to support the aid recipients by donation or- ganization. Many people are reluctant to support to this donation because of the lack of transparency. In addition, many donation organizations lack transparent and formal administration due to lack of working capital. Therefore, this paper pro- poses a method to enhance personal trans- parency by enhancing the transparency of donation organizations and protecting the privacy of sponsors using blockchain that is a Hyperledger fabric.

- 10) An Investigation of Fraud in Non- profit Organizations: Occurrences and Deterrents. Author: Janet Greenlee, Mary Fischer Teresa Gordon and Eliz- abeth Keating. [The Hauser Centre for Non-profit Organizations Harvard Uni- versity]. Losses due to fraudulent activities are par- ticularly troublesome in the non-profit sec- tor because they directly reduce resources available to address tax-exempt purposes. The ensuing bad publicity may also reduce contributions and grants in subsequent pe- riods. This paper uses data provided by Certified Fraud Examiners to report on the types of fraud they identified in non-profit organizations and the characteristics of both the victims and the perpetrators of the fraudulent activities. Based on the analysis of the data, the authors suggest ways that fraud losses can be prevented or mitigated. In particular, governing boards are urged to consider important controls in addition to the annual financial statement audit.

Sr. No	Paper Name	Publisher	Techniques	Merits	Demerits
1.	Research on Charity System Based on Blockchain.	hubaokun. Hangzhou Institute of Ser-vice Engineer-ing, Hangzhou Normal Uni- versity, Hang-zhou.	-BlockchainTechnology.  - Dapp Model.	- Explained complete blockchain technology and its working. And also, Dappmodel which is based on Ethereum to verify our sys-tem and demon- strate some core functions of the charity plat- forms.	- Some ap- plications require veri- fication of user identity and as there is no central authority to verify the user identity. it becomes an issue while devel- oping such applications.
2.	Research on Bitcoin: A Peer-to- Peer Electronic Cash System.	Satoshi Nakamoto.	-Peer-to-peernetworking technique.  -Timestamps transaction tech- nique.  -Simplified payment verifi- cation technique	- We propose a solution to the double- spending problem using a peer- to- peer network. A purely peer- to- peer version of electronic cash would allow online pay- ments to be sent directly from one party to an- other without going through a financial insti- tution. - A timestamp server works by taking a hash of a block of items to be timestamped and widely pub- lishing the hash.	- Assuch, the verifica- tion is relia- ble as long as honest nodes control the network, but is more vul- nerable if the network is overpowered by an attack- er. the sim- plified meth- od can be fooled by an attacker's fabricated transactions for as long as the attacker can continue to overpower the network.
				- It is possible to verify pay- ments without running a full network node. A user only needs to keep a copy of the block headers of the longest proof- of- work chain.	

3.	Developing a Reli-able Service System of Charity Donation During the Covid- 19 Outbreak.	School of Eco-nomics and Management, Nanjing University of Sci-ence and Technology, Nanjing.	-Blockchain technology  -Mathematical algorithms (e.g.,SHA256, proof-of-work),	-Blockchain provides a new independent, tamper-proof, and transparent platform to securely store, transmit and process sensitive and valuable data. -SHA-256 hashing algorithm is used to confirm the transaction And creates a new block to the chain.	- Data is im- mutable on blockchain. Data once written can-not be re-moved. If a person utilizes a digital platform that runs on blockchain technology, then he will be unable to remove its trace from the system when he doesn't want it there.
4.	Blockchain smart contracts: Applications, challenges, and future trends.	Shafaq Naheed Khan, Faiza Loukil, Chirine Ghedira-Guegan <sup>3</sup> Elhadj Benkhelifa <sup>4</sup> , Anoud Bani-Han.	- Smart contract and different platforms to develop and deploy smart contract (e.g., NXT, Ethereum, Hyperledger Fabric)	- Smart contracts are executable codes that run on top of the blockchain to facilitate, execute, and enforce an agreement between untrustworthy parties without the involvement of a trusted third-party.	- In addition to the vulnerability problem, smart contracts face several challenges including privacy, legal, and performance issues.
5.	Managing charity 4.0 with Blockchain: a case study at the time of Covid-19.	University G. D'Annunzio of Chieti-Pescara, Viale Pindaro, Italy. Corresponding Author: Adalberto Ragone.	- Blockchain  - Charity Wall(CW)	- The Blockchain's added value for philanthropy consists in transparency and accountability as well as create a transparent relationship with donors and recipients and improve efficacy to reaching the right people.  -Charity Wall is the most advanced and complete tool to trace and notarize the use of donations using the immutability and security of the Blockchain. Charity Wall combines a Social Market place and Automated Audit Solution for the charity sector.	- The blockchain technology can't be edited or modified meaning all the information on it has to be 100% accurate. If for e.g., you lose the private key used to access the blockchain, it's almost impossible to get access to the network.
6.	Review of Distributed Ledgers: The technological Advances behind cryptocurrency.	Suvarna Kadam	-Distributed Ledger Technologies (DLT).  - Bitcoin Blockchain, Ethereum, Hyperledger Fabric, R3 Corda.	- A distributed ledger can be thought of as a consensus on replicated, shared, and synchronized digital data that is managed without	- The centralized nature of ledgers has two problems 1) Cyber-attacks are easier on single target making

			<ul style="list-style-type: none"> <li>- Waves, Ripple, Hash graph</li> </ul>	<p>any need of central administrator or centralised data storage. Data is stored in geographically spread-out locations.</p> <ul style="list-style-type: none"> <li>- The protocol defines computationally expensive task called mining. Mining serves as two purposes: 1) To verify the legitimacy of a transaction and avoiding double-spending, 2) To create new digital currencies by rewarding miners for performing the previous task.</li> <li>- In permissionless DLT platforms, the ledger is maintained by collaborative action among nodes in the public network and is accessible to everyone.</li> </ul>	<p>ledgers more vulnerable to security threats, 2) The original intention of decentralised Web is not fulfilled with centralized ledgers.</p> <ul style="list-style-type: none"> <li>- A record is transaction being stored in the ledger by a peer node. It is often cryptographically key to assure integrity and non-repudiation.</li> </ul>
7.	An Overview of Smart Contract and Use cases in Blockchain Technology	Bhabendu Kumar Mahanta, Soumya Shree S Panda, Debashish Jena.	- Smart Contract.	<p>- Blockchain technology concept derived from initial Bitcoin transaction system. A blockchain is a digital ledger which stores transaction publicly after verifies the transaction by nodes.</p> <p>- Each transaction is validated by the nodes and transactions are secured by cryptography hash function.</p>	<ul style="list-style-type: none"> <li>- All the transaction information is present in a smart contract and it executes automatically.</li> <li>- Once smart contract is executed then we can't modify that contract.</li> </ul>
8.	A block chain based decentralized exchange.	Harsh Patel.	- Decentralized technology	<p>- The decentralized exchange standardizes the speed of transaction across all financial instrument there by reducing loss due to speed of transfer.</p>	<ul style="list-style-type: none"> <li>- peer to peer version of the exchange system would allow all parties access to the market without relying on any central organization for market access.</li> <li>- Speed of transfer is a limited of different financial instrument</li> </ul>

9.	A Study of Private Donation System Based on Blockchain for Transparency and Privacy.	junho jeong	-Blockchain Technology	<p>-Therefore, there should be regular notification of this information. In addition, it is necessary to inform sponsors regularly that information is needed.</p> <p>- Provide the security/privacy &amp; Maintaining Transparency in this system.</p>	<p>- people tend to avoid sponsorship because of the lack of transparency in the sponsoring organization.</p> <p>- In addition, many sponsoring organizations lack transparent and formal administration due to lack of working capital.</p>
10.	An Investigation of Fraud in Non-profit Organizations: Occurrences and Determinants.	Janet Green-lee, Mary Fischer Teresa Gordon and Elizabeth Keating.	<p>- The surveys provide the most complete in-depth data presently available concerning fraud in the non-profit sector. The seventeen-page survey instrument used to collect the data focused on the following six areas: cost of occupational fraud, methods used to commit fraud, methods used to detect fraud, characteristics of the organizations victimized by fraud, characteristics of the perpetrators of fraud, and legal outcomes of the fraud.</p>	<p>- The ensuing bad publicity may also reduce contributions and grants in subsequent periods.</p> <p>- While the breadth of the problem is unknown, recent media reports suggest the level of fraud might be extensive.</p>	<p>- due to the lack of regulatory resources, action may not always be taken.</p>

### III. CONCLUSION

We studied the combination of blockchain technology and philanthropy, a new charity platform model based on blockchain is proposed. In this system, users complete the donation using smart contracts. All transactions are recorded on the blockchain to realize traceability of funds, which increase the transparency of charities. The lack of transparency in charity activities could be solved technically with this blockchain charity system, which could increase the public's trust in charity organizations. Some core components have been realized and verified by a decentralized application we have developed. A complete charity system based on blockchain in the future is the next step for us.





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- [4] Blockchain smart contracts: Applications, challenges, and future trends. Author: Shafaq Naheed Khan1 · Faiza Loukil2 · Chirine Ghedira-Guegan3 · El-hadj Benkhelifa4 · Anoud Bani-Han (2021).
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