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Decentralized and Transparent Charity Implementation in Ethereum

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Abstract- The arrival of blockchain technology brings the possibilities for transparency, accountability, and efficiency in various applications including the charity. In this paper, we used the smart contract for charity works in a public blockchain. In traditional system, donors have minimum visibility and accountability into the donation fund. In this proposed platform, all transactions are recorded into the decentralized ledger of the public blockchain. The consensus is supported by the public Ethereum blockchain. The work is an approach of implementing decentralized transparent charity and the data privacy is maintain using the filter at smart contract.

Keywords: Charity, Decentralized, Transparency, Smart Contract, Blockchain

1. Introduction

Blockchain is a decentralized ledger that enables transparent and safe transaction recording across the nodes[1]. The consensus concept of Blockchain, where the decentralized network of users approves the transactions. To create an immutable record each transaction is contained within a block and added to a chronological chain of previous blocks. We select Ethereum over other blockchains because it has the feature of programmable smart contracts and strong ecosystem[2]. Smart contracts are self-executing contracts that allow for process automation, transparency, and security based on the existing structure and programable logic. Donors can give money to philanthropic projects directly through the use of smart contracts[3], [4], eliminating the need for middlemen like banks or any other payment processors. As a result, less transaction fees are incurred and more donations are possible to distribute among beneficiaries. The flow of money can be monitored to see how the contributions are used during the course of a project by using the distributed ledger in charity[5]. This openness feature promotes trust and gives the assurance that the donors' contributions are helping individuals properly.

This study intends to expand the uses blockchain technology in the nonprofit industry. We aim to encourage more innovation and acceptance of decentralized and transparent charity implementations in Ethereum and elsewhere by exploring the advantages, difficulties, and potential solutions. This project intends to open the door for a more effective and influential charitable ecosystem. The technology Blockchain has the ability to transform the philanthropic landscape.

2. Problem Statement and Motivation

The problems such as trust, transparency, and accountability[6] have the history to plague the field of philanthropy and charity giving initiatives. The impact of charity initiatives, and donors frequently have little access into the donation life cycle. For the decentralized and transparent features blockchain technology has come to light as a viable solution to these issues[7].

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The motivation is to overcome the problem of accountability in the charity.
The philanthropic organizations have had their reputations tainted by instances of poor management, financial theft, and supervision. In order to automate the implementation and oversight of philanthropic operations, smart contracts can be created using Ethereum blockchain. In absence of a standardized structure for accountability, which allows for possible mismanagement, embezzlement, and fraud within the philanthropic sector. The seed motivation of this research project is to address the charity problems and come up with the decentralized solution.

3. Proposed Work

Addressing the problems in charity works this research proposes a comprehensive exploration of the implementation of decentralized and transparent charity systems in Ethereum blockchain as shown in Fig. 1. We performed literature review and investigate existing deployed decentralized charity solutions. We propose the charity framework that encompasses the following key components.

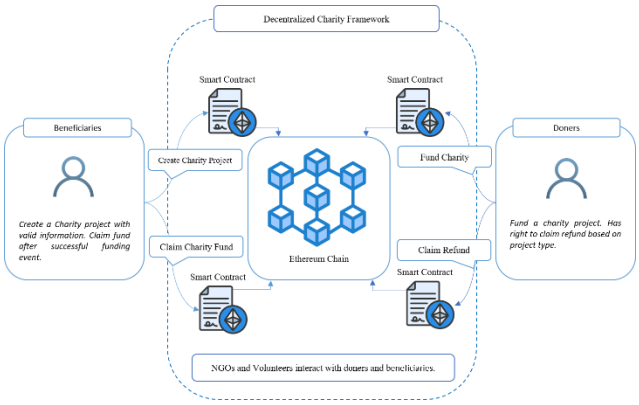

Fig. 1: Proposed decentralized transparent charity.

This propose framework is an attempt to ensure responsible and inclusive implementation of decentralized charity system.

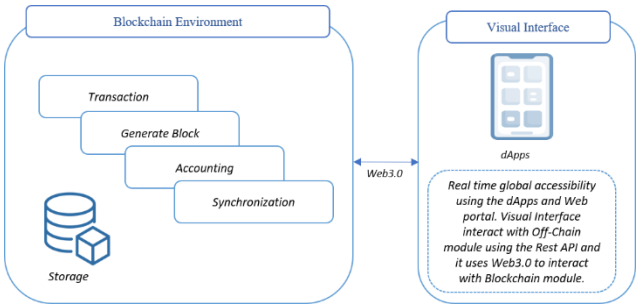

Fig. 2: Blockchain and dApps interaction.

Fig. 2 shows dApp connection to blockchain using through the web3.0 library, which serves as the interface between the dApp

and the blockchain network. The web3.js library provides a set of functions and methods that allow dApp to interact with smart contracts, read data from the blockchain, and send transactions. By utilizing web3.0, dApp can seamlessly connect to the blockchain network, enabling decentralized functionality and facilitating secure and transparent transactions.

4. Implementation of Proposed Work

The implementation of the proposed work is done in three steps: i. Deploy charity smart contract ii. Test the functionality and iii. Publish the smart contract.

i. Deploy charity smart contract

The smart contract *omuCharity* was deployed in the Ethereum *Sepolia* Test Network was done from the wallet account, as shown Fig. 3 and Fig 4.

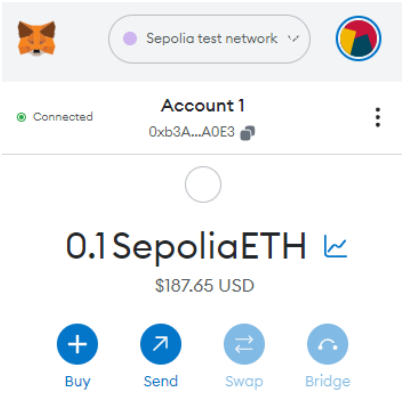

Fig. 3: Wallet with address.

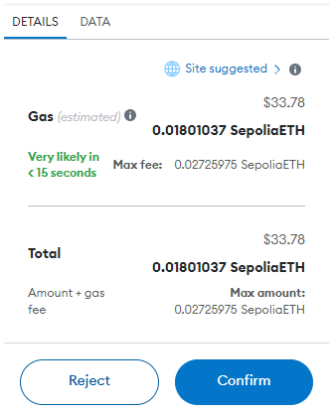

Fig. 4: Confirm Deployment.

ii. Test the functionality

After deploying the smart contract, we get the contract address and the functions are as per the Fig. 5. These functionalities from the RemixIDE. After testing we were sure that all the functionalities are responding well as per the smart contract. For higher degree testing we are planning to interact the functionality using dApp environment. When an external application or another smart contract wants to interact with the blockchain, it needs to have some knowledge of a smart contract's interface such as a way to identify a method and its parameters. This is facilitated by the Ethereum Application Binary Interface (ABI). And this ABI is similar to the Application Program Interface (API).

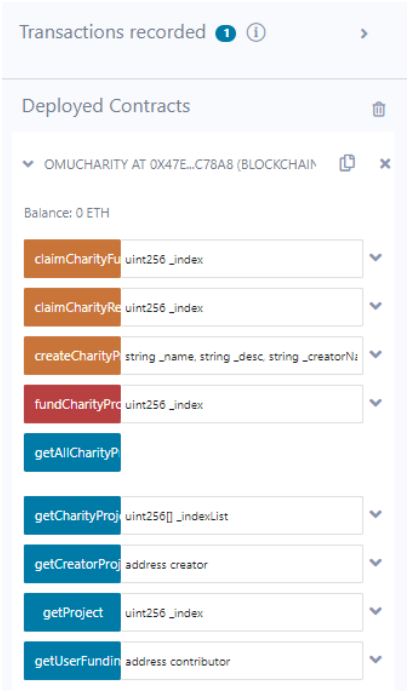

Fig. 5: Functions of deployed smart contract

iii. Smart contract in Etherscan

Fig. 6 shows smart contract in Etherscan and that is available in the following link.
`https://sepolia.etherscan.io/tx/Transaction Hash`

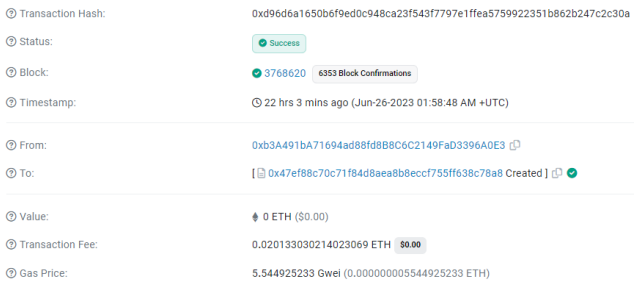

Fig. 6: Smart contract in Etherscan.

5. Conclusion and Future Work

The Ethereum-based decentralized and transparent charity implementations present solutions with great potential, but for widespread usage, issues including scalability, user adoption, and regulatory considerations still need to be resolved. The impact of decentralized, open, and transparent charity systems that are compatible with all blockchain platforms can be further improved by researchers and practitioners. The dynamic nature of blockchain technology presents many chances for innovation and advancement, ultimately resulting in a philanthropy ecosystem that is more effective, transparent, and consequential.

To improve and optimize these systems, further study and cooperation with government agencies and nonprofit groups are required. Future work can focus on the investigation privacy-enhancing techniques, such as zero-knowledge proofs or secure

multiparty computation, to enable confidential transactions. The functionality of NGOs and volunteers are still under research and deployment of this proposed framework, those will be implemented with the progress of current research work.

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