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Ethereum based Fundraising Tracking System for Cancer Patients

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ABSTRACT—This research paper proposes an Ethereum based fundraising tracking system for cancer patients. The system lever- ages blockchain technology to create a secure and transparent platform for patients to receive donations from individuals and organizations. Real-time tracking of donations and a dashboard for patients to manage their funds and expenses are included in the platform. The proposed system can help address the challenges of the current fundraising process, including lack of transparency and accountability, and can be a game-changer in the field of cancer treatment, where timely financial assistance is critical.

KEYWORDS: Ethereum, Blockchain, Fundraising, Secure

I. INTRODUCTION

Cancer is one of the leading causes of death worldwide, and its treatment can be financially burdensome for patients and their families. Fundraising has grown in popularity as a means of assisting cancer patients with covering their medical costs. The existing fundraising procedure, however, can be time-consuming, ineffective, and lacking in openness and accountability. These challenges may result in donors' mistrust and hamper the fundraising process's effectiveness. Therefore, a more efficient and secure infrastructure is required to over- come these issues and guarantee timely financial support for cancer patients.

In this research paper, we propose an Ethereum based fundraising tracking system for cancer patients.In order to offer a transparent and safe platform for patients to accept donations from people and organisations, the system makes use of blockchain technology. All transactions are recorded using Ethereum smart contracts, which provide them trans- parency and tamper-proofing. This fosters confidence between donors and patients and guarantees that donors can see how their donations are being used. The proposed system also includes real-time tracking of donations, making it easier for patients to monitor their funds and ensure they receive the necessary financial assistance. Additionally, the system includes a dashboard for patients to manage their funds and expenses, streamlining the process and ensuring that they Identify applicable funding agency here. If none, delete this.

can track their treatment costs. Benefits of the suggested method include the capacity to foster confidence between donors and patients, accountability and transparency in the fundraising process, and prompt financial support for cancer patients. Other medical ailments can use the system to help expedite fundraising efforts and guarantee that patients get the necessary financial support.

II. LITERATURE REVIEW

The use of blockchain technology in healthcare has gained attention in recent years, with many studies exploring its potential benefits in areas such as patient data management, drug supply chain management, and clinical trials. However, few studies have explored the use of blockchain in fundraising for healthcare, particularly in the context of cancer treatment. Blockchain technology may improve transparency and security in the fundraising process, lowering the chance of fraud and boosting donor trust, according to a study that looked at its usage in medical crowdfunding platforms. The survey also emphasised how crucial it is to make sure the platform is user- friendly and open to everyone. According to a survey on the situation of cancer patient fundraising, cancer patients make up the largest segment of users on medical crowdfunding sites, which have grown in popularity in recent years. However, the report also emphasised the drawbacks of the present fundraising procedure, such as a lack of accountability and transparency, as well as the dangers of fraud and money- laundering.

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III. SYSTEM DEVELOPMENT

1. *Blockchain:* Blockchain is decentralized ledger designed to be a secure way of handling data based on a peer-to-peer architecture[1]. The two features of blockchain technology are transparency and distributed data architecture. Blockchain technology acquires transparency by removing the centralized node or any third party need for processing. It is a sequence of blocks of data linked to each other with different connected nodes which forms the chain-network of blockchain. Once a new transaction is approved by consensus, it is encrypted and linked to the previous transaction. Once a piece of data is added to the chain, it cannot be deleted. If there are any modifications to be done in any created block, a new block is created stating the modifications, if this block is approved by consensus of the network, it is appended to the chain. In this way, if an impostor tries to tamper with the recorded data, he/she can never mend already created data without the consent of the network. The approximate time taken for a blockchain network to create a single block in the blockchain is called block time.The block time for Ethereum blockchain is from 14 to 15 seconds. The included data becomes verifiable by the time of block completion. A Distributed blockchain networks are safe against any vulnerability that crackers can exploit in centralised computer system. Security methods used are based on public-key cryptography. A public key for a node (a long, randomly generated string of numbers or characters) used to address a node on the blockchain. Tokens transferred over the blockchain are logged as association to that address.
2.

2. *Hardhat Network:* Hardhat Network, a local Ethereum network node optimised for development, is already included with Hardhat. It enables you to execute tests, deploy contracts, and debug code all locally on a single workstation.

The Solidity support at Hardhat Network is exceptional. It is always aware of the smart contracts that are being executed, what they do specifically, and why they fail.

Hardhat Network will issue an exception in the event that a transaction or call fails. This exception will include both a JavaScript stack trace and a Solidity stack trace, with the stack traces starting in JavaScript/TypeScript up until the point at which you called the contract and continuing with the entire Solidity call stack.

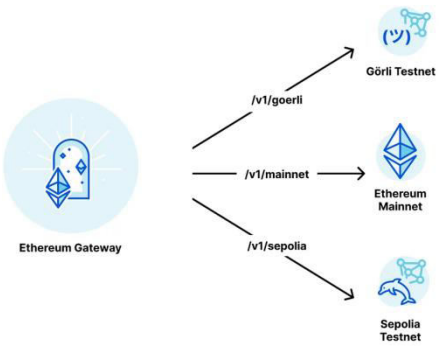

Fig. 1. Goerli Faucet

3. *Testnets:* A testnet is a blockchain network developed specifically for testing different functions by developer groups. This makes it possible for developers to try out upgrades be- fore releasing them to the mainnet. Additionally, it means that developers can use testnets to first test their smart contracts and dapps. Projects can also test public engagement because anyone can use public testnets. It resembles a ”sandbox” setting in many ways.

4. *Meta Mask:* With the help of MetaMask, users may access decentralised applications on the distributed web and run Ethereum dApps right in a web browser without having to install a full Ethereum node. Its main goal is to make Ethereum services simpler and remove the difficulties brought on by Blockchain technology. With the help of a secure identity wallet provided by MetaMask, users can send or request cryptocurrency using the recipient’s address by providing a one-of-a-kind username and password. The user gets informed when the transaction is finished. Charity-Chain makes use of metamask’s features to transfer ether between accounts.

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IV. DEVELOPMENT

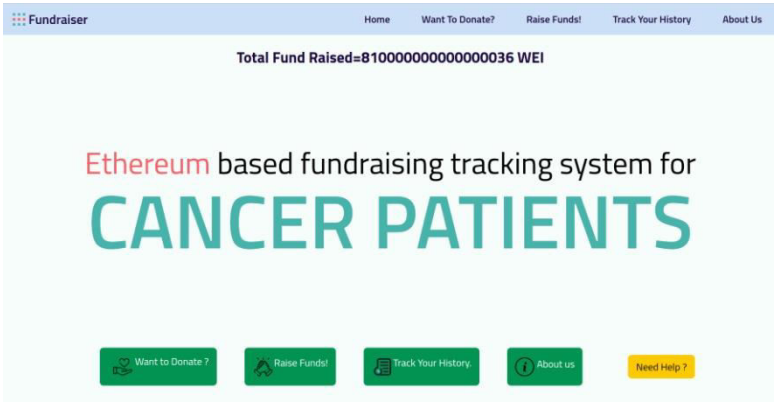

Fig. 2. System design

Following are the essential steps for development purposes and also for the running project on its own system.

Step1: Install all the necessary software tools which are listed as follows:

1. Visual studio code
2. Solidity smart contracts compiler (Remix IDE)
3. Ganache-CLI (Ethereum and js test environment)
4. Node.Js and NPM
5. Metamask

Step2: Create Distributed Application Frontend

To create the front end of an application, one needs to use web technologies such as HTML/CSS and ReactJS. Us- ing these technologies, the application's homepage, Browse Request, Donor Dashboard, and Track Donation pages are designed by creating HTML pages and linking them to each other

Step3: Link to meta mask wallet

When a user conducts a transaction using ethers, a small amount of the currency is used to process the transaction through a process called mining. To use the Metamask plat- form, users need to register and receive a public key, which they can use to send or receive ethers. In the case of donating to a charity, the donor would send the ethers to the charity's public key, which is listed on the charity's page. Metamask provides a user-friendly interface for completing transactions.

Step4: Keep track of the transactions

When Fundraiser creates a fund request using create option as shown in Fig 5. Then Etherscan API allows for transactions to be tracked and reviewed. If a user knows the public key associated with another user, they can view all of that user's transactions. This capability is available to any user in the network.

V. SYSTEM DESIGN AND DEVELOPMENT

A. Home Page

This is the landing page that the user will see after opening the platform's website.
The landing page has a navbar from which the user can navigate through the platform to perform the necessary actions.

Create Donation's Requests

On this page, the user needs to request funding for the Ethereum network. The user needs to fill in the details to proceed.
On the following page, the user needs to fill in details such as the host's address, the title of request, and due date.

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Donate Fund

In this section, the user can donate the fund to the opening requests.In these, the user has two options where he can due transactions in web also as well as by scanning QR code.

VI. CONCLUSION

The proposed Ethereum based fundraising tracking system for cancer patients has the potential to address the challenges of the current fundraising process and provide timely financial assistance for cancer patients. The use of blockchain technol- ogy ensures transparency and accountability, reducing the risk of fraud and increasing trust among donors and patients. The system's dashboard features and real-time donation tracking make it simpler for patients to keep track of their finances and outgoings, which lessens the pressure of fundraising and frees them up to concentrate on their care. The approach can also promote trust among donors by demonstrating to them that the lives of patients are truly improved by their donations.

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