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<u>**DEPARTMENT OF INFORMATION TECHNOLOGY**</u>

Report On

Charity Platform Using BlockChain

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CERTIFICATE

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Abstract

The content of this abstract is a proposal for a charity platform that utilizes blockchain technology to increase transparency and accountability in charitable donations. The proposed platform would utilize a smart contract-based system to ensure that funds are distributed fairly and transparently, with clear records of all transactions available to the public.The platform would use a combination of Solidity, Web3, and Ganache to create a decentralized application (DApp) that can be accessed by anyone with an internet connection. Solidity would be used to create the smart contracts that govern the distribution of funds, while Web3 would be used to communicate with the Ethereum blockchain. Ganache would be used as a local blockchain development environment to test and deploy the contracts.The platform would allow donors to contribute to specific charities or causes, with funds being held in escrow until the charity meets certain criteria, such as demonstrating a clear plan for how the funds will be used. Once the criteria are met, the funds would be released to the charity, with records of the transaction stored on the blockchain for transparency. The platform would also allow donors to track the progress of their donations in real-time, with updates on how the funds are being used and the impact they are having. Donors would also be able to provide feedback on the charities they support, helping to build a community of trust and accountability.

Chapter 1: Introduction

The concept of blockchain technology has been a game-changer in various sectors, and the charity sector is no exception. With concerns over transparency and accountability in charitable donations, there has been an increasing interest in utilizing blockchain technology to create a more secure and transparent charity platform.The proposed charity platform would utilize blockchain technology to create a decentralized, secure, and transparent system for charitable donations. Blockchain technology provides an immutable, tamper-proof ledger that allows for transparent and secure record-keeping, making it an ideal solution for the charity sector.

The proposed platform would use smart contracts to govern the distribution of funds, with clear criteria for when funds can be released to charities. This would help to ensure that funds are distributed fairly and transparently, with clear records of all transactions available to the public. The platform would also provide donors with real-time updates on the progress of their donations, including information on how the funds are being used and the impact they are having. This would help to build a community of trust and accountability around charitable giving, allowing donors to see the impact of their donations in real-time.

In addition to increasing transparency and accountability, the proposed platform would also address some of the challenges faced by charities in accessing funding. Blockchain technology would allow for low-cost, fast transactions, with no need for intermediaries such as banks or payment processors.

1.1 Motivation

The motivation behind developing a charity platform using blockchain technology is to address the challenges faced by the charity sector in terms of transparency, accountability, and accessibility to funding. The traditional charity model often lacks transparency, with concerns over how donated funds are being used and the impact they are having. This lack of transparency can lead to a lack of trust in the charity sector, which can discourage potential donors from contributing to charitable causes.

By utilizing blockchain technology, the proposed charity platform would provide a decentralized and transparent system for charitable donations, allowing donors to track the progress of their donations in real-time and building a community of trust and accountability. The use of smart contracts would help to ensure that funds are distributed fairly and transparently, with clear records of all transactions available to the public.

1.2   Problem Analysis

Following are the major problems in traditional wallets:

- The traditional charity model often lacks transparency, with concerns over how donated funds are being used and the impact they are having.
- Charities often face challenges in accessing funding, with high transaction fees and difficulty in accessing traditional banking services.
- Unsecured contracts and transactions in typical wallets due to access gained by third-party

By addressing these problems through the use of blockchain technology, a charity platform can help to create a more transparent, accessible, and accountable system for charitable donations. In the final part of this series, we will go over some of the potential uses of charity platform using blockchain outside the realm of cryptocurrencies.

1.3   Objectives

- One of the key objectives of a blockchain-based charity platform is to enhance transparency in the charity sector by providing a decentralized and transparent system for charitable donations.
- To leverage the security and immutability of the blockchain to ensure that the money entrusted in the wallets is safe from attacks.

1.4 Scope

The scope of a blockchain-based charity platform would involve creating a decentralized and transparent system for charitable donations, using blockchain technology to address the challenges faced by the charity sector. Overall, the scope of a blockchain-based charity platform would be to create a more efficient, transparent, and accountable system for charitable donations, using blockchain technology to address the challenges faced by the charity sector and build a community of trust and accountability around charitable giving.

Chapter 2: Literature Review

In "Blockchain Technology in Charitable Organizations: Opportunities and Challenges," the authors discuss how blockchain technology can help charitable organizations address challenges related to transparency, accountability, and cost-efficiency in donation management. The authors explain that traditional payment systems used by charitable organizations can be costly due to high transaction fees and slow processing times. By using blockchain technology, charitable organizations can reduce transaction costs and increase the speed of payment processing. Blockchain technology can enhance transparency and accountability in donation management by providing a tamper-proof and decentralized system for tracking donations. This can help to increase trust in charitable organizations and reduce the risk of fraud or mismanagement of funds. Donors can track the use of their donations and ensure that they are being used for the intended purposes.

In "Towards a Blockchain-Based Charitable Platform," the authors explore the potential of blockchain technology to develop a decentralized and transparent system for charitable donations that enables efficient and secure record-keeping and transaction processing. The authors point out that the traditional charity sector is plagued with issues such as inefficient donation processing, high transaction fees, and a lack of transparency, which often lead to a lack of trust in charitable organizations.

In "Decentralized Charitable Giving: A Case for a Blockchain-Based Platform," the authors argue that the traditional charitable donation system is plagued with inefficiencies, high transaction costs, and a lack of transparency, which often result in a lack of trust in charitable organizations. The authors propose a blockchain-based platform that can address these issues by providing a decentralized and transparent system for charitable donations.

In "Charitycoin: A Blockchain-Based Platform for Charitable Giving," the authors present a platform that aims to address the lack of transparency and accountability in the charity sector by leveraging the benefits of blockchain technology. The platform, called Charitycoin, is built on a decentralized ledger that enables real-time tracking of donations and ensures that funds are being used effectively. The authors argue that the current charity system suffers from a lack of

transparency, where donors are often unable to track the use of their donations and ensure that they are being used for their intended purposes.

In "Blockchain-based charity crowdfunding platform for sustainable development goals," the authors present a platform that aims to address the challenges in traditional charity crowdfunding by leveraging the benefits of blockchain technology. The platform is built on a decentralized ledger that enables transparent and secure record-keeping and transaction processing.

In "A blockchain-based model for charitable donations," the authors present a model that aims to leverage the benefits of blockchain technology to create a more efficient and transparent system for charitable donations. The model is based on a decentralized ledger that can enable secure and transparent record-keeping and transaction processing. The authors argue that the current system for charitable donations suffers from a lack of transparency and accountability, where donors are often unable to track the use of their donations and ensure that they are being used for their intended purposes.

The proposed model solves this problem by using smart contracts to automate the donation process and track the use of funds on a tamper-proof ledger. Donors can track the progress of the charitable project in real-time, see how their funds are being used, and ensure that the project is aligned with the charitable objectives. The authors also discuss the potential of the model to increase the efficiency of the charitable donation process by reducing transaction costs and increasing the speed of donation processing. By eliminating intermediaries and automating the donation process, the model can reduce transaction fees and increase the efficiency of donation processing.

In recent years, blockchain technology has emerged as a potential solution to some of the challenges faced by the charity sector, particularly around transparency and accountability. In the paper "Blockchain Technology for Charitable Organizations," the authors explore how blockchain technology can enable charitable organizations to increase transparency, reduce fraud, and improve donation management.

One key benefit of blockchain technology is its ability to provide a transparent and immutable record of transactions. By using blockchain technology, charitable organizations can create a public ledger that shows how donations are being used, increasing transparency and accountability. This also helps to build trust between donors and charitable organizations, as donors can see exactly where their donations are going.

Blockchain technology can also help to reduce fraud in the charity sector. By creating a secure and decentralized system for donation management, blockchain technology can ensure that donations are being used for their intended purpose and that funds are not being diverted for other purposes. This can help to build trust between donors and charitable organizations, which is crucial for the long-term sustainability of the sector.In addition, blockchain technology can enable more efficient donation management. By using smart contracts, charitable organizations can automate many of the processes involved in donation management, such as tracking donations and distributing funds. This can reduce administrative costs and enable charitable organizations to focus more resources on their core mission.

Overall, the paper "Blockchain Technology for Charitable Organizations" highlights the potential of blockchain technology to transform the charity sector by increasing transparency, reducing fraud, and improving donation management. As the technology continues to evolve, it is likely that we will see more charitable organizations adopting blockchain-based solutions to address the challenges they face.

Chapter 3: Proposed System

The proposed system is a blockchain-based charity platform that aims to increase transparency, accountability, and trust in the charity sector. It provides a decentralized platform for charitable donations, where donors can track their donations in real-time and ensure that funds are being used effectively.

Here are some features of a charity platform using blockchain :

1. Smart Contract: The wallet should use a smart contract to ensure that the funds are locked securely and released only when the predetermined conditions are met.

2. Decentralization: The wallet should be decentralized, meaning that it should be based on a blockchain network such as Ethereum, Bitcoin, or another blockchain platform.

3. Security: The wallet should be designed with security in mind, and it should include features such as two-factor authentication, multi-signature, and encryption.

4. User Interface: The wallet should have a user-friendly interface that allows users to easily lock and unlock their funds and monitor their assets.

5. Transparency: The blockchain-powered time-lock wallet should be transparent, with all transactions and activities recorded on the blockchain network.

6. Compatibility: The wallet should be compatible with various devices, including desktop computers, smartphones, and tablets.

7. Interoperability: The wallet should be interoperable with other wallets and blockchain-based applications, allowing users to transfer their locked assets to other wallets or use them in other applications.
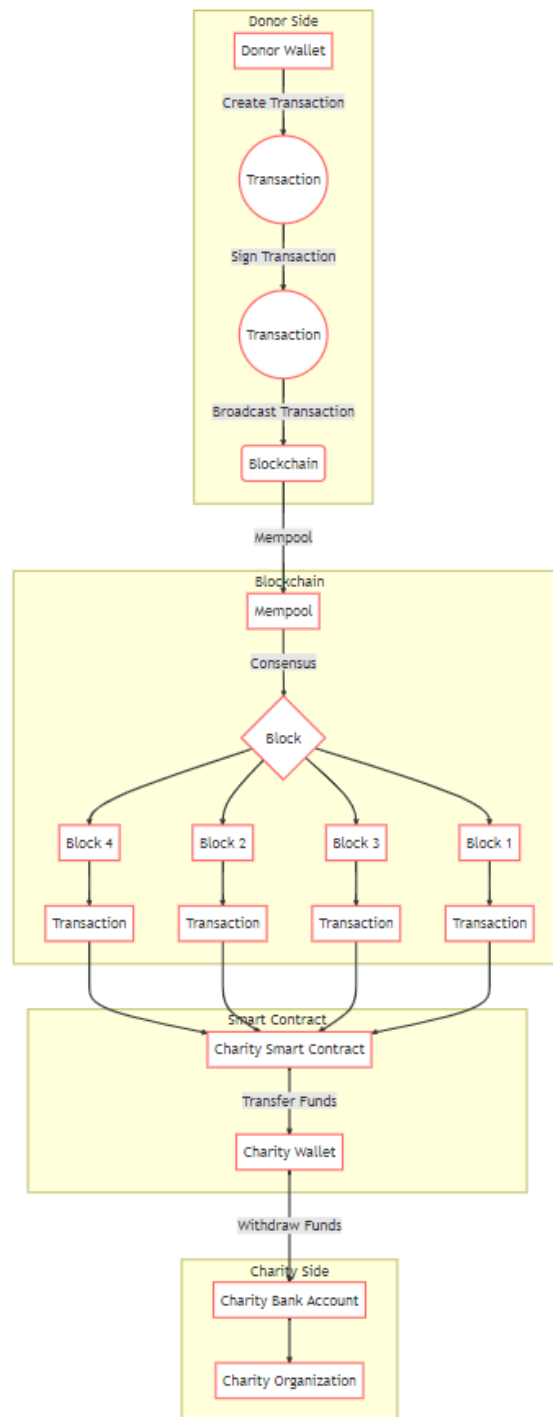
3.1 Proposed Approach and Details

Fig.3.1 : Charity Platform Architecture

The architecture consists of three main components: the Donor Side, the Blockchain, and the Charity Side. Each component contains various blocks that represent different parts of the system.

The Donor Side includes the Donor Wallet block, which is used by the donor to initiate a donation. The donor creates a transaction using their wallet and signs it to verify that it came from them. The signed transaction is then broadcast to the network.

The Blockchain component contains several blocks, which collects transactions from the network and waits for consensus to be reached on which transactions should be included in the next block. Once consensus is reached, a new block is added to the blockchain, and the transactions in the block are considered final and cannot be altered.

The Charity Smart Contract block is responsible for monitoring the blockchain for incoming donations. When a new transaction is included in a block, the smart contract automatically verifies the transaction and transfers the funds to the Charity Wallet block, which is a block in the blockchain that contains the charity's funds.

The Charity Side includes the Charity Bank Account block, which is the charity's bank account where they can withdraw funds from the Charity Wallet block in the blockchain. The charity can use these funds for their organization's purposes.

This architecture allows donors to make donations using a blockchain-based system, which provides increased security and transparency. The charity smart contract automatically verifies and transfers the funds to the charity, reducing the need for manual processing and potential errors. The use of a blockchain also ensures that all transactions are recorded and cannot be altered, providing a transparent and auditable system.

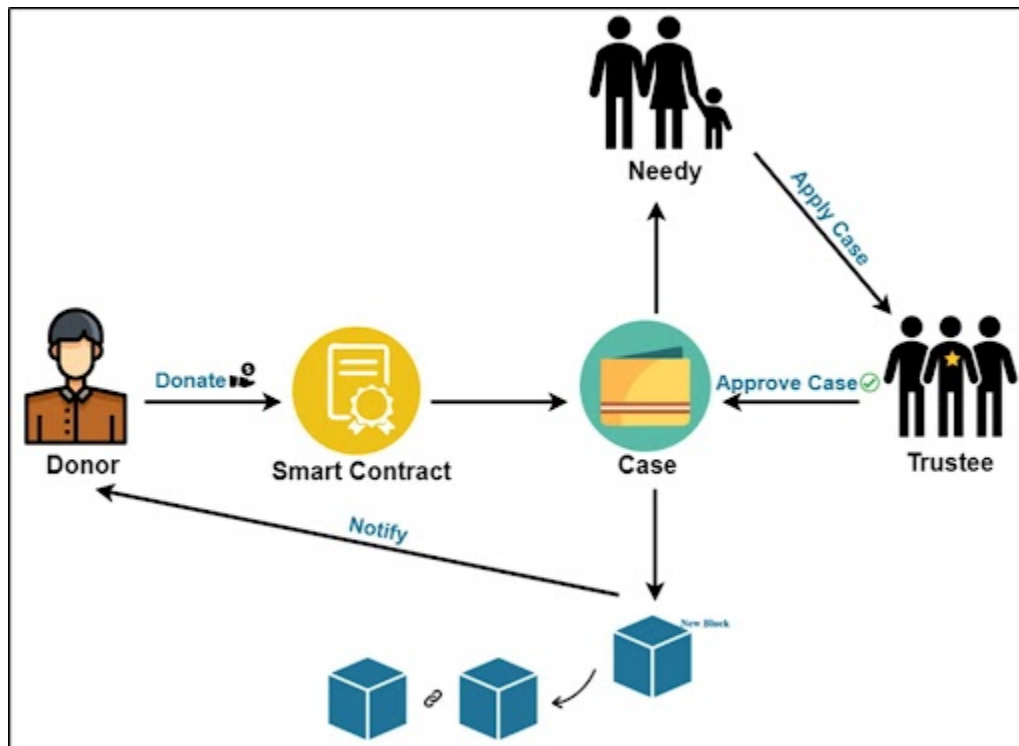The proposed approach is visualized in figure 3.2 below.

Fig.3.2 : Diagrammatic View of Proposed Approach

3.1.1 USER INTERFACE

The system uses Solidity, Web3, Metamask, Node.js, and Ganache to create a secure and user-friendly platform. Solidity provides inheritance properties in contracts, including multiple level inheritance properties, which can be used to develop smart contracts for the platform. Web3 is used to connect the platform to the Ethereum blockchain, while Metamask provides an easy-to-use and secure wallet service for users.

3.1.2 SMART CONTRACT

The smart contract will be the backbone of the charity platform system. The smart contract will be responsible for locking the funds and enforcing the blockchain mechanism. The smart contract will be programmed to release the funds to the wallet owner after the specified time has elapsed.

The smart contract will also be designed to be transparent and auditable. Anyone can view the smart contract code and verify that it is working as intended. This provides users with confidence that their funds are safe and secure.

3.1.3 BACKEND

Node.js acts as a backend for the application, recording transactions and communicating between the applications and integrating the frontend. Ganache provides the GUI-based local Ethereum blockchain development environment to deploy and test contracts.

The platform stores details of charities and organizations, generating a hash value for each one. When a transaction occurs between the donor and the charity, a transaction hash is generated, and a block is created when the user mines all the transactions updates. This ensures that all transactions are recorded on the blockchain, providing a transparent and secure system for charitable donations.

Chapter 4: Implementation Details and Result

The proposed system is a blockchain-based charity platform that aims to increase transparency, accountability, and trust in the charity sector. It provides a decentralized platform for charitable donations, where donors can track their donations in real-time and ensure that funds are being used effectively.

- A metamask connection is required to run the application for any transaction.
- A ganache RPC Server is run with metamask as the wallet, using the node.js interface.
- Charity and organization details are saved in the application, and a hash value is generated
- A transaction is carried out, between organization and charity and transaction hash is generated for each transaction
- A block is created, when the user mines all the transaction updates.

4.1 Technology Stack

- Ethereum Blockchain for decentralized infrastructure.
- VScode IDE for smart contract testing and deployment
- HTML, CSS, JS and React for web application development
- Metamask for wallet integration

The proposed approach has been implemented and the application is explained in this section :

A] SETUP

Smart Contracts: The system uses Solidity programming language to implement smart contracts that govern the transactions between the charity and the organization. These smart contracts include functions to create new charities and organizations, record transactions between them, and generate transaction hashes.

Web3: Web3 is used to interact with the Ethereum blockchain network. It allows the system to communicate with the smart contracts and send transactions to the blockchain.

Metamask: Metamask is used as a wallet service to store the user's private keys and sign transactions. The system connects to Metamask automatically to provide an easy-to-use and secure wallet service.

Node.js: Node.js is used as the backend for the application. It records transactions and communicates between the applications and integrates the frontend. It also serves as a bridge between the frontend and the Ethereum blockchain network.

Ganache: Ganache provides a GUI-based local Ethereum blockchain development environment to deploy and test smart contracts. It is used to test the smart contracts before deploying them to the main Ethereum network.

B] CONTRACT CREATION

In the proposed blockchain-based charity platform, a smart contract is created to manage the transactions between donors and charities. The contract is created using Solidity, a programming language specifically designed for writing smart contracts on the Ethereum blockchain. The smart contract is deployed on the blockchain using a development environment like Remix IDE or Truffle. The contract is then tested and verified using tools like Ganache or Rinkeby test network before being deployed on the main Ethereum network. The contract includes functions for managing the donations, such as accepting donations from donors and transferring funds to the charities. The contract also includes functions for storing and retrieving information about the charities and their activities.
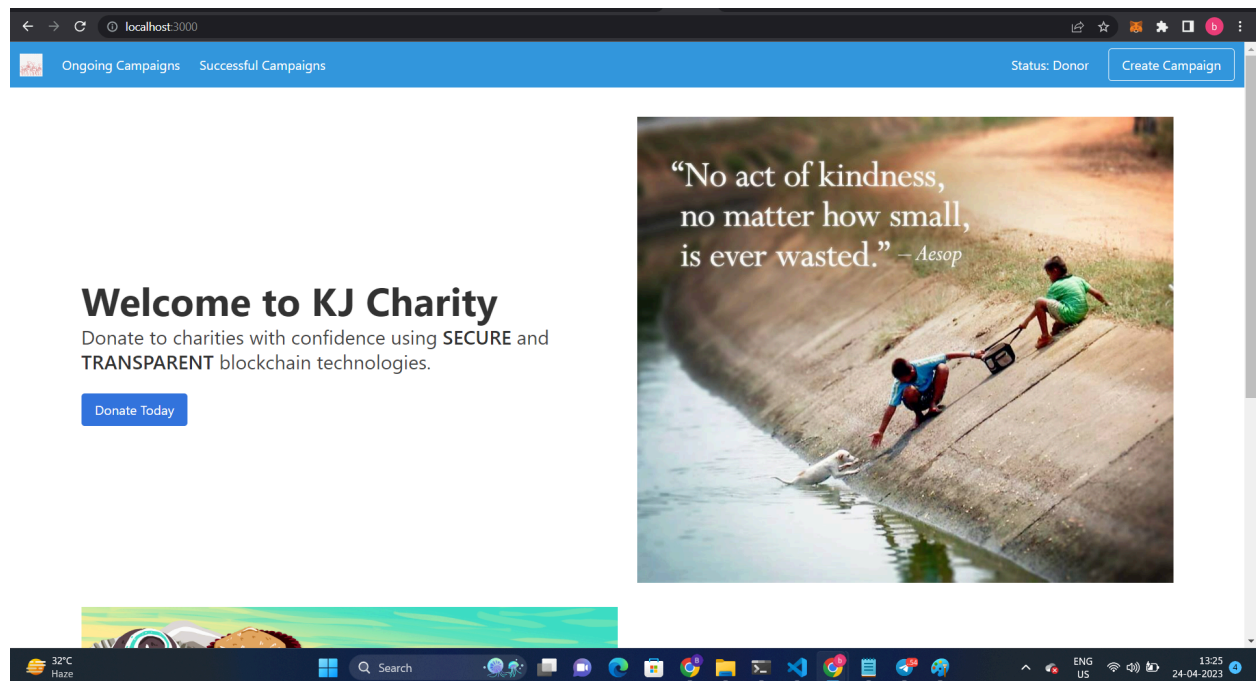
C] DEPLOYMENT

To ensure security and transparency, the contract is programmed with certain conditions that must be met before a transaction can be executed. For example, the contract may require that a certain percentage of the donated funds be used for the stated charitable purpose, and that any unused funds be returned to the donor. Once the contract is deployed on the blockchain, it becomes immutable and cannot be altered, providing a high level of security and transparency for the

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charity platform. a contract is created to manage the transactions between donors and charities. The contract is created using Solidity, a programming language specifically designed for writing smart contracts on the Ethereum blockchain. The smart contract is deployed on the blockchain using a development environment like Remix IDE or Truffle. The contract is then tested and verified using tools like Ganache or Rinkeby test network before being deployed on the main Ethereum network. The contract includes functions for managing the donations, such as accepting donations from donors and transferring funds to the charities. The contract also includes functions for storing and retrieving information about the charities and their activities.

Fig. 4.1 Home Page

The home page of a charity system project that offers options for creating campaigns, donating, and viewing ongoing campaigns can be an effective way to engage users and encourage them to support the organization's cause. Here's a more detailed elaboration of each option:
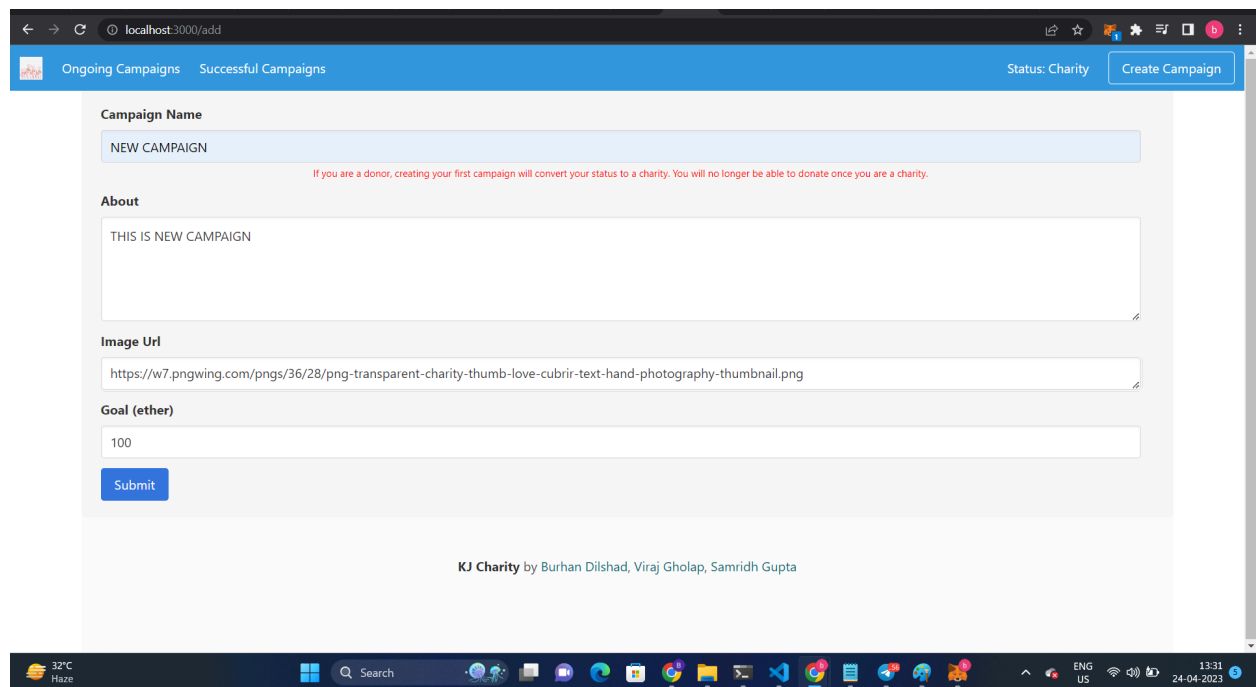
Create Campaign: This option allows users to start their own fundraising campaigns to support the charity's mission. Users can create a campaign page that explains their goal, provides details about the cause they are supporting, and encourages others to donate. The campaign page can also

feature images, videos, and other multimedia content to help tell the story and inspire donors. The user should be able to set a goal for their campaign and track progress towards that goal.

Donate: This option allows users to make a direct donation to the charity. The donation process should be simple and secure, with clear instructions and options for different donation amounts. Users should also have the option to make recurring donations or donate in honor of someone else.

View Ongoing Campaign: This option allows users to see current and past campaigns that have been created to support the charity's mission. Users can see how much money has been raised, who has donated, and what impact the campaign has had. This information can help users make informed decisions about how they want to support the charity and inspire them to get involved.

Overall, these options provide users with different ways to engage with the charity and support its mission. By providing clear, user-friendly interfaces for each option, the charity can create a positive user experience and encourage more people to get involved.

Fig. 4.2 Create Campaign

After clicking on the Create campaign button on the homepage of our website it will redirect to the new page which will consist of the form in which the user who is creating the campaign has to fill the campaign information like campaign name,about in which we have to provide description

of the campaign and after that the user have to upload url of an image which consists campaign information, and in the end how much amount of ether the cause creator wants. After giving all the information it will click on the submit button and the cause campaign will be created.
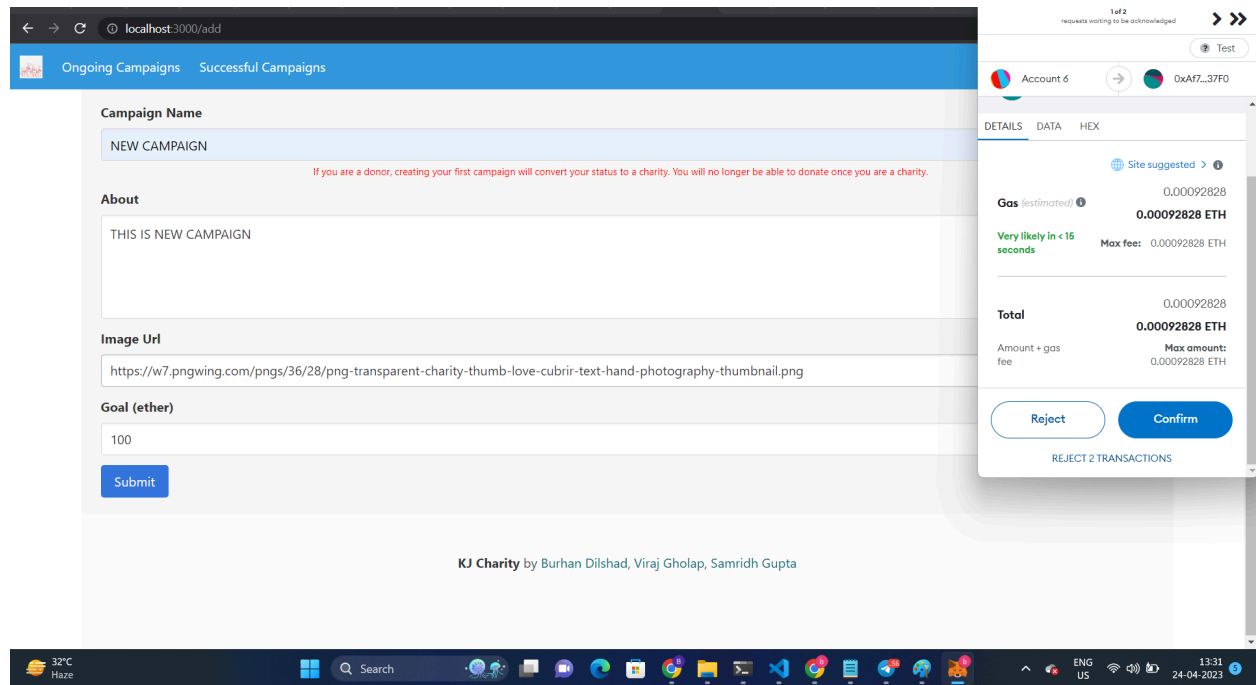

Fig. 4.3 Charity Details

After filling all the information in the campaign form it will redirect to the metamask wallet in which is needed by the creator of the cause respectively.
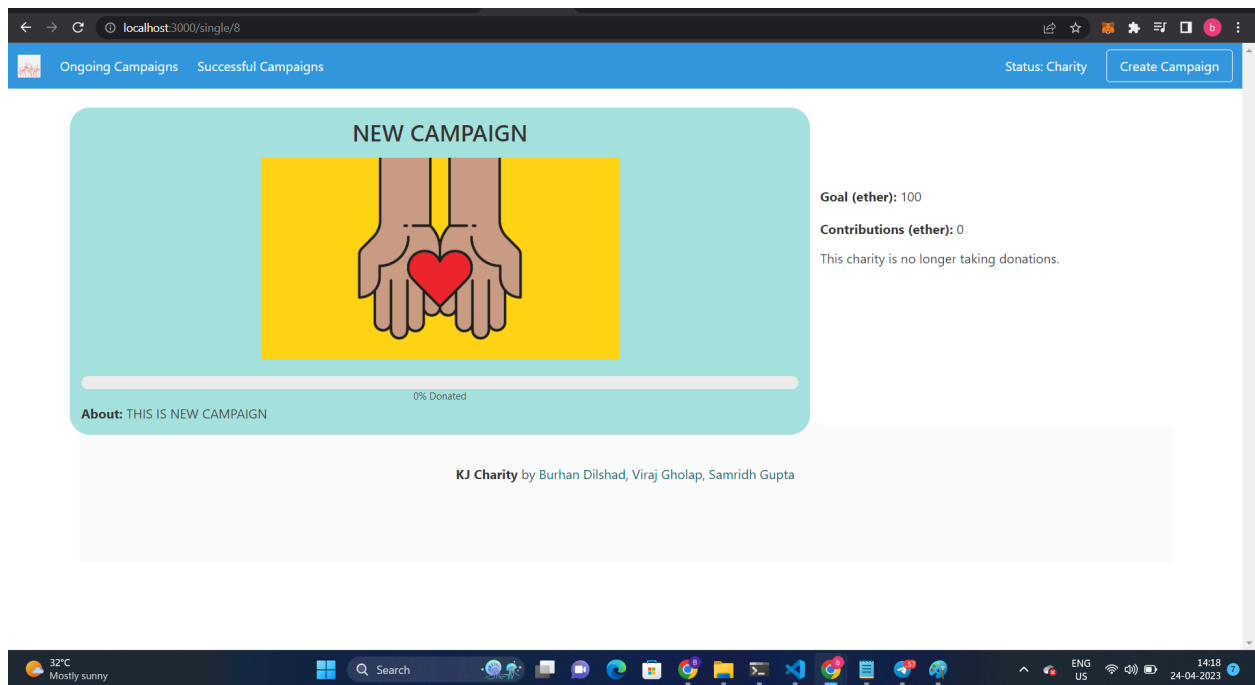
Fig. 4.4 Campaign Details

After creating the campaign by the user it will show the above image in which it will show the information about the cause, goal of the total donation, the contributed ether, and the charity is ongoing or not accepting donation status.

Chapter 6: Observation

Indeed, blockchain technology has the potential to revolutionize the way charitable organizations operate. By using a decentralized and transparent system for charitable donations, donors can be assured that their contributions are being used effectively and for the intended purpose. Moreover, the use of blockchain technology can increase transparency and accountability by allowing donors and other stakeholders to track the flow of funds in real-time and verify that they are being used appropriately.

Furthermore, the immutable nature of blockchain technology ensures that all transactions are recorded in a tamper-proof manner, making it easier to detect fraud and prevent misuse of funds. This increased transparency and accountability can also lead to increased trust in the charity sector, which can in turn lead to increased donations and support for charitable causes.

In addition, blockchain technology can reduce the transaction costs associated with traditional payment systems, such as banks and credit card companies, making it easier and cheaper for charitable organizations to receive and process donations. This can ultimately result in more resources being directed towards charitable causes and less being spent on administrative costs.

Overall, the use of blockchain technology in the charity sector has the potential to revolutionize the way charitable organizations operate, increasing transparency, accountability, and efficiency, and ultimately leading to greater impact and support for charitable causes.

Chapter 7: Conclusion

In conclusion, blockchain technology has the potential to transform the charity sector by increasing transparency, accountability, and efficiency in donation management. By providing a decentralized and immutable ledger for recording transactions, blockchain can enable donors to track their donations in real-time and ensure that funds are being used effectively by charities. Moreover, the use of smart contracts can automate the process of donation management, reducing the need for intermediaries and lowering transaction costs. However, the implementation of blockchain-based charity platforms still faces some challenges, such as regulatory compliance, scalability, and user adoption. Regulatory compliance is critical for charities to ensure that they are following legal and ethical standards while using blockchain technology. Scalability is another challenge, as blockchain platforms may struggle to handle a large volume of transactions, especially during peak times. Lastly, user adoption is essential to the success of blockchain-based charity platforms, and charities need to ensure that their donors are comfortable using this new technology.

Despite these challenges, the potential benefits of blockchain technology in the charity sector are significant, and further research and development are necessary to overcome these challenges and unlock the full potential of this technology. Overall, the use of blockchain technology in the charity sector is a promising development that can help create a more transparent, efficient, and accountable system for charitable giving.

Chapter 8: Future Work

In the future, there is potential for the charity sector to fully embrace blockchain technology and its benefits. One area for future work is the development of more user-friendly and accessible blockchain-based charity platforms that can be used by smaller organizations with limited resources. Additionally, there is room for improvement in the scalability and efficiency of blockchain technology to handle the high volume of transactions that occur in the charity sector. Another area for future work is the integration of smart contracts, which can automate the distribution of funds based on predetermined conditions, reducing the need for intermediaries and increasing transparency.

Furthermore, there is potential for the use of blockchain technology to improve the tracking and monitoring of the impact of charitable donations, providing donors with more detailed information about how their funds are being used and the outcomes of charitable projects. This can increase trust and confidence in the charity sector and encourage more people to donate. Additionally, the use of blockchain technology can enable more cross-border donations and the elimination of high transaction fees associated with traditional payment systems.

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