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Blockchain UE21CS342BA5

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Blockchain-Based Charity Donation Platform

1. Summary

The Blockchain-Based Charity Donation Platform leverages Ethereum blockchain technology to offer a transparent and secure environment for charitable donations. This decentralized platform ensures that all transactions are traceable and irreversible, fostering trust among donors and ensuring that contributions are used for their intended purposes. By utilizing smart contracts, the platform automates the processes of receiving donations and approving expenditures, which reduces administrative costs and potential human errors.

2. Project Objectives

- **Transparency** : To provide a clear record of all financial transactions, which any network participant can audit.
- **Security** : To ensure that donations are secure and only accessible to authorized parties.
- **Efficiency**: To reduce overheads related to the management of funds and streamline the process of donations.
- **Engagement**: To increase donor engagement by providing real-time visibility into how contributions are being used.

3. Technology Stack

- **Front-End**: React.js
- **Blockchain**: Ethereum
- **Smart Contracts**: Solidity
- **Blockchain Interaction**: ethers.js
- **Development Environment**: VS Code, Ganache
- **User Authentication**: Metamask for Ethereum wallet integration

4. System Architecture

4.1 Smart Contract Design (`charity.sol`)

- ## Variables:

  1. **contributors**: Mapping of Ethereum addresses to their donation amounts.
  2. **requests**: Mapping of unique request IDs to their respective funding requests.
  3. **`noOfContributors`**, **`raisedAmount`**, **`numRequests`**: Variables to keep track of the number of contributors, total raised funds, and total funding requests respectively.

- ## Functions:

  1. - **`sendEth()`**: Allows donors to send ETH to the smart contract. It also updates the contributor count and total raised amount.
  2. - **`createRequests()`**: Enables the manager to create funding requests which include details like the recipient address and funding target.

3. - `**voteRequest()**`: Allows contributors to vote on whether a particular funding request should be granted.
4. - `**makePayment()**`: Facilitates the transfer of funds to the recipient of a funding request upon successful voting.

4.2 Application Workflow

- The platform starts with the deployment of the `charity.sol` smart contract, which sets up the initial parameters and the manager's address.
- Users interact with the system via a web interface built with React. They can become contributors by sending ETH to the contract through the `sendEth` function.
- The manager can create new funding requests, which are then subject to a vote by the contributors.
- Once a request receives the majority of votes, the manager can disburse the funds to the designated recipient through the `makePayment` function.

5. Front-End Application Overview

5.1 Main Components

- **App Component**: Initializes the connection to Ethereum and loads the smart contract.

- **Contributors Component**: Allows users to submit their donations and view transaction receipts.

- **Manager Component**: Used by the manager to create and manage funding requests, and to check the contract's balance.

- **Request Component**: Displays all active requests and allows contributors to vote and see the current number of votes.

5.2 User Interaction

- Users need to have Metamask installed to interact with the platform. The application checks for the presence of Metamask and prompts the user to install it if it's not found.

- Upon successful connection, users can access different functionalities based on their role (donor, manager) directly from the web interface.

6. Challenges and Solutions

- **Security**: Smart contract security is paramount. Regular audits and the use of established libraries help mitigate risks.

- **Scalability**: Handling a large number of transactions and users can be challenging. Solutions include optimizing contract functions and considering layer-2 scaling solutions.

- **User Experience**: Ensuring a seamless interface with quick feedback on transactions can improve user satisfaction.
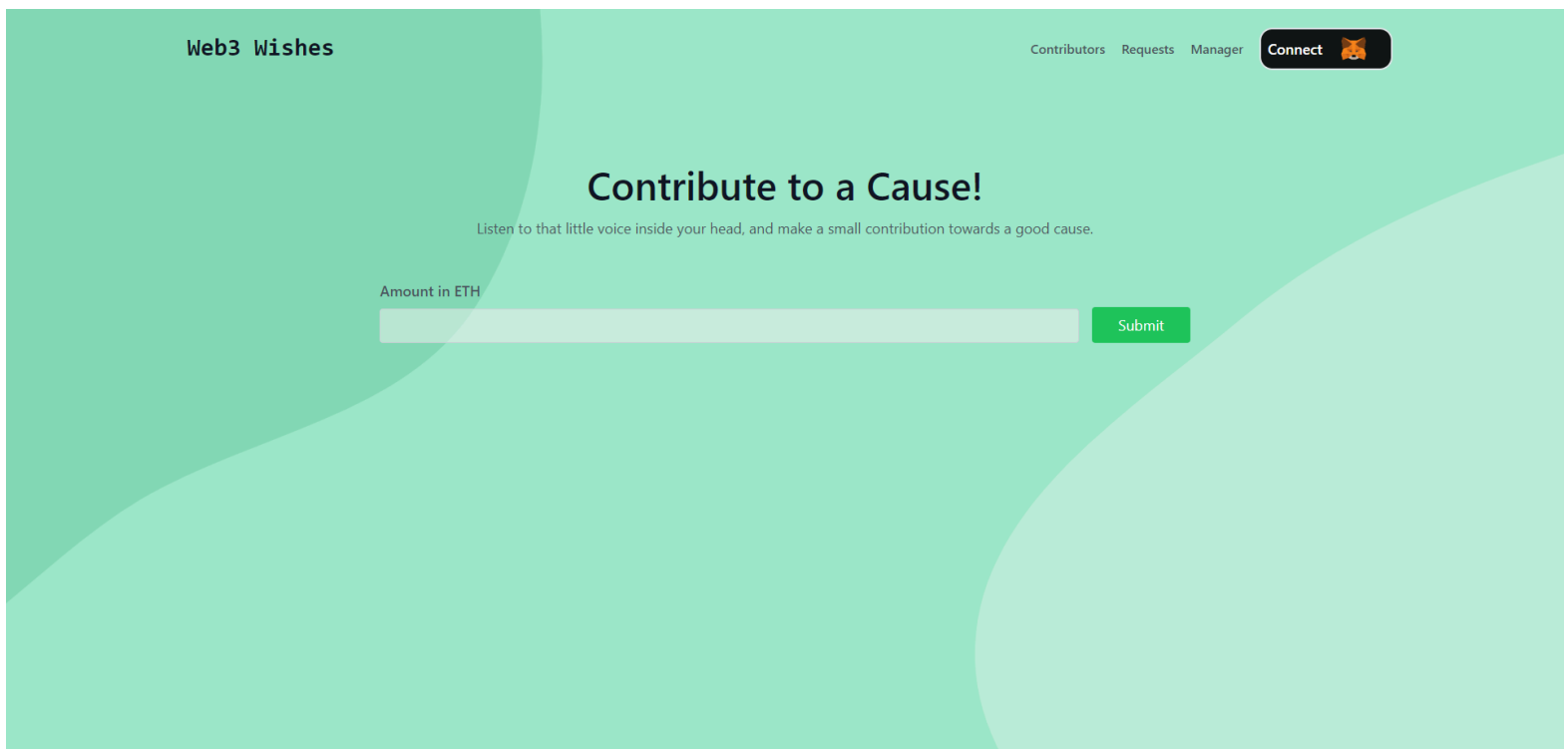
7. Conclusion

The Blockchain-Based Charity Donation Platform represents a significant advancement in how charitable contributions are managed and tracked. By leveraging blockchain technology, the platform provides an unprecedented level of transparency and efficiency, potentially transforming the charity sector.

8. Future Work

- **Implementing AI and ML**: To predict the success of funding requests and analyze donation patterns.

- **Cross-Chain Functionality**: To accept donations in various cryptocurrencies across different blockchains.

- **Enhanced Reporting Tools**: For both donors and managers to generate detailed reports on the impact of their contributions and the overall fund utilization.

9. ScreenShots

Contributors   Requests   Manager   **0x07a...e370** 🗋

Contract Balance -: 0.99042 ETH

Create Request

Here manager of this Charity Contract can create request.

Recipient Address

Target in ETH

Description

Submit

Recipient Address
0x7F45E736009eF4631Dd1f9C5747CeE850556FEe0

This is the second demo for the class :)

Vote   Donate

Votes   2   Funds Need   0.2 ETH

Recipient Address
0x7F45E736009eF4631Dd1f9C5747CeE850556FEe0

Support our cause to provide clean drinking water to communities in need, ensuring healthier futures for countless individuals worldwide. Your donation can make a tangible difference in saving lives and fostering sustainable development.

Vote   Donate

Votes   1   Funds Need   0.3 ETH

Recipient Address
0x7F45E736009eF4631Dd1f9C5747CeE850556FEe0

Join us in empowering underprivileged youth through education, offering them the opportunity to build brighter futures and break the cycle of poverty. Your support can transform lives and pave the way for a more equitable society.

Vote   Donate

Votes   0   Funds Need   0.2 ETH

Recipient Address
0x7F45E736009eF4631Dd1f9C5747CeE850556FEe0

Help us protect endangered wildlife habitats by supporting our conservation efforts, preserving biodiversity for future generations to enjoy. Together, we can make a positive impact on the environment and safeguard precious ecosystems.

Vote   Donate

Votes   0   Funds Need   0.4 ETH

Recipient Address
0x7F45E736009eF4631Dd1f9C5747CeE850556FEe0

this is for blockchain class 1234

Vote   Donate

Votes   0   Funds Need   1 ETH