

GIV3R

Decentralized Charity Portal: *Empowering Transparent Philanthropy through Blockchain Technology*

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Traditional System

- In a world where charitable contributions play a pivotal role in addressing societal needs, there is a pressing need for a transparent and efficient system that connects donors with a diverse range of charity organizations.
- Traditional methods of donation often lack transparency, leaving donors uncertain about the impact of their contributions.

Problem Statement

- Traditional methods of supporting charitable causes, like donating money through banks or financial institutions, can be slow, inefficient, and opaque. This lack of transparency and effectiveness creates a trust deficit among donors and discourages support for charitable causes. Moreover, charitable organizations struggle to find and manage volunteers, as well as access necessary resources for their vital work.

Objectives

- **Transparency Enhancement** : Enable donors to have full transparency into the utilization of their contributions by implementing a blockchain-based system that records and displays real-time transactions related to specific fundraising campaigns.
- **Efficient Fundraising** : Facilitate charity organizations, including NGOs and other entities, in hosting decentralized fundraising campaigns. Utilize blockchain technology to streamline the fundraising process, making it secure, transparent, and efficient.
- **Unified Volunteer Engagement** : Create a centralized platform for NGOs and various charity organizations to post volunteer opportunities. Provide volunteers with a user-friendly interface to easily discover and engage with causes aligned with their interests.

Objectives

- **Real Time Transaction Tracking** : Develop a feature that allows donors to track transactions in real-time, offering a clear view of how their contributions are being utilized by charity organizations. Enhance accountability and build trust between donors and charities.
- **User Friendly Interface** : Design an intuitive and accessible user interface for donors, charity organizations, and volunteers. Prioritize a seamless user experience to encourage engagement and participation.
- **Decentralized Smart Contracts** : Develop and deploy smart contracts on the blockchain to manage fundraising campaigns, volunteer incentives, and other critical processes. Ensure the security and efficiency of smart contracts to maintain the integrity of the platform.

Litureture Review

Paper	SmartCon: A Blockchain-Based Framework for Smart Contracts and Transaction Management
Author	Muhammad Muneeb, Zeeshan Raza, Irfan Ul Haq, Omair Shafiq
Published	2021
Study	<ul style="list-style-type: none">Transactions have immutable cryptographic signaturesSmart contracts self-execute with agreement termsUsing separate blockchains for storing smart contracts and transactions
Conclusion	Secure and transparent blockchain architecture ensuring integrity and accessibility in executing and tracking contracts.
Drawback	Scalability challenge due to separate blockchains for smart contracts and transactions.

Figure: Dual Blockchain for Smarter Contract Security and Transparency

Litureture Review

Paper	Recent Advances in Smart Contracts: A Technical Overview and State of the Art
Author	Kemmoe V Y, Stone W, Kim J, Kim D, Son J
Published	2020
Study	<ul style="list-style-type: none">• Development and compilation of smart contracts• Deployment and storage on blockchain• Execution and validation by nodes
Conclusion	Smart contracts operate by being developed, deployed, and executed on a blockchain, providing a secure and automated way to enforce and execute contractual agreements.
Drawback	Challenging to update or correct errors in the code, potentially leading to unintended consequences or vulnerabilities.

Figure: Ensuring Secure Automation with Blockchain Technology

Application Flow

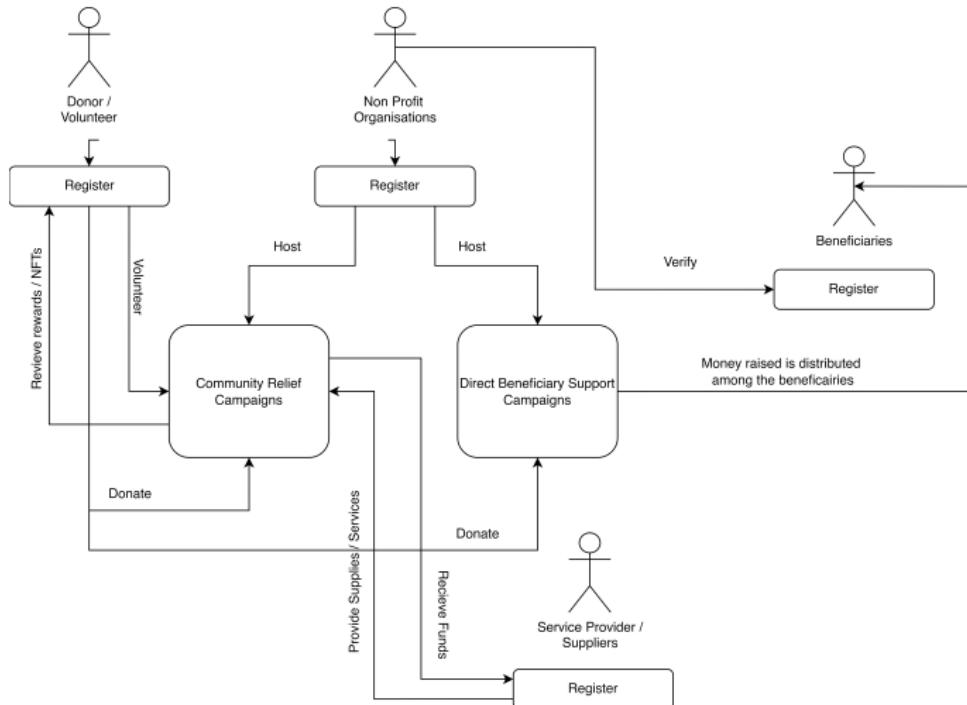


Figure: Application Flow of the System

Application Flow

- The application flow of the decentralized charity platform involves a series of steps that guide users, donors, charity organizations, and volunteers through the process of registration, donation, campaign hosting, and volunteer engagement. Here's a detailed description of the typical application flow:

Application Flow

Registrations

User Registration

All users, including donors, volunteers, beneficiaries, NGOs, and service providers, must register on the website. Needy individuals' registrations are verified by sponsoring NGOs.

Charity Organization Registration

Charity organizations register on the platform, providing details about their mission, goals, and verification information. The platform may include a verification process to ensure the legitimacy of charity organizations.

Campaign Hosting

Campaign Creation

NGOs can create two types of campaigns:

- *Direct Beneficiary Support Campaigns*: Funds are directly donated to the web3 wallets of verified needy individuals.
- *Community Relief Campaigns*: Funds are used to provide services for the needy through service providers.

Application Flow

Donation Process

Direct Beneficiary Campaigns

Donors can contribute funds and track their contributions' progress and verify if funds reached the target individuals.

Community Relief Campaigns

Donors can track if their payments reached the service providers.

Application Flow

Volunteering

Volunteering for Community Relief Campaigns

Users can volunteer for Community Relief Campaigns, indicating their willingness to participate in events or activities. NGOs approve volunteer applications and post volunteer opportunities on the platform.

Transparency Measures

Transparency in Campaigns

Donors can view the funds raised and spent at any time during a campaign, ensuring transparency and building user trust. Needy individuals can see the number of contributions and the donors who contributed to their well-being, enhancing transparency and accountability.

Application Flow

Real-time Communication

Platform Notifications

The platform sends real-time notifications to users, including updates on campaign progress, volunteer opportunities, and transaction confirmations.

Additional Feature for Direct Beneficiary Support Campaigns

Beneficiary Payout Conversion

For Direct Beneficiary Support Campaigns, beneficiaries have the option to convert the raised cryptocurrency into their native local currency. This conversion process facilitates seamless access to funds for beneficiaries who may not have the means to manage cryptocurrencies. Upon conversion, the funds are directly deposited into the beneficiaries' bank accounts, ensuring ease of use and financial accessibility.

System Architecture

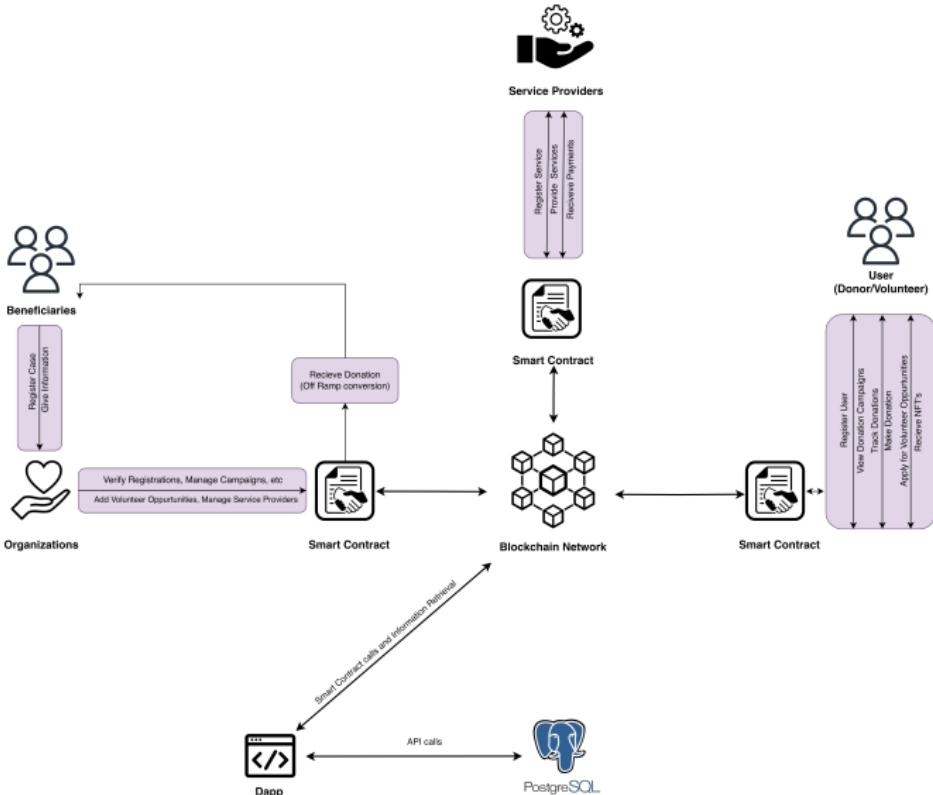


Figure: Overview of System Architecture

System Architecture

Frontend

- The frontend is built using Next.js, which serves as the user interface for donors, charity organizations, and volunteers.
- It includes pages for user registration, campaign creation, volunteer opportunities, and transaction tracking.
- Implements user authentication and interacts with the backend through API routes.

Backend

- Next.js is used for the backend as well, handling API routes for various functionalities.
- API routes manage user authentication, campaign creation, volunteer opportunities, and interactions with the blockchain.

System Architecture

Database

- Connects to a database (MongoDB or PostgreSQL) to store non-blockchain data, including user information, campaign details, and volunteer registrations.

Blockchain Layer

- Integrates with a blockchain network (Ethereum) for transparent and secure management of smart contracts.
- Smart contracts handle fundraising campaigns, donation tracking, volunteer incentives, and record transactions on the blockchain.

Ethers.js

- Interacts with the blockchain node using Web3.js or Ethers.js to handle transactions, queries, and events on the blockchain.

Metamask Wallet

- MetaMask serves as a digital wallet that enables users to securely store, send, and receive Ethereum (ETH) and other ERC-20 tokens.
- Once installed, it seamlessly integrates into the browser's interface, providing easy access to Ethereum-based decentralized applications (dApps) and blockchain functionalities.

NFT

- It is a type of digital asset that represents ownership or proof of authenticity of a unique item or piece of content using blockchain technology.
- Volunteers on our platform are offered certificates in the form of NFTs.

Tools and Technologies



Figure: Tools and Technologies used

Results



Figure: This is the home page of the Decentralized Charity Portal.

Result

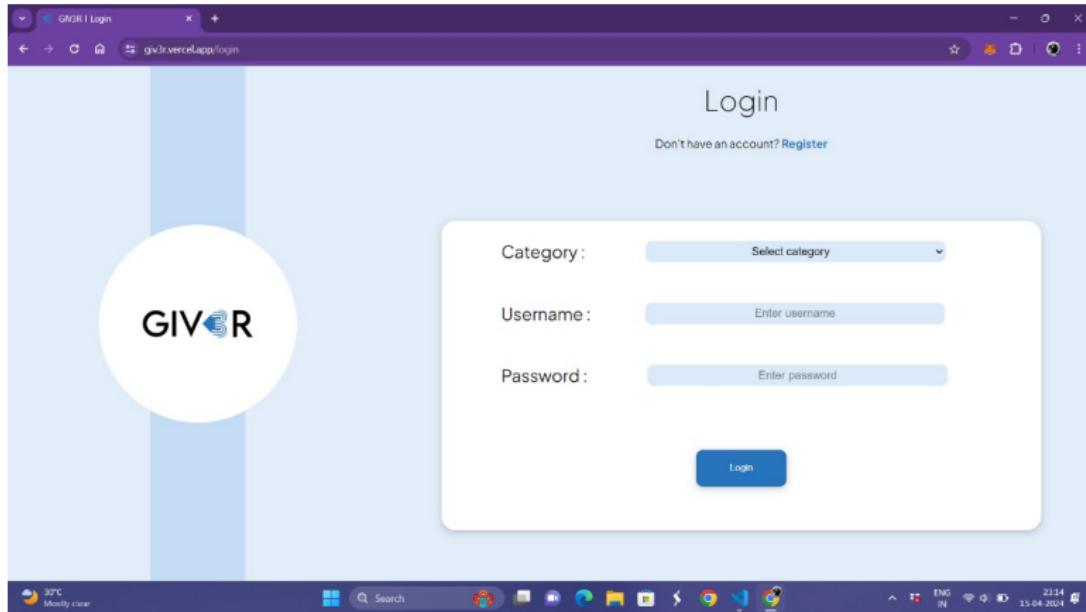


Figure: This is the login page.

Result

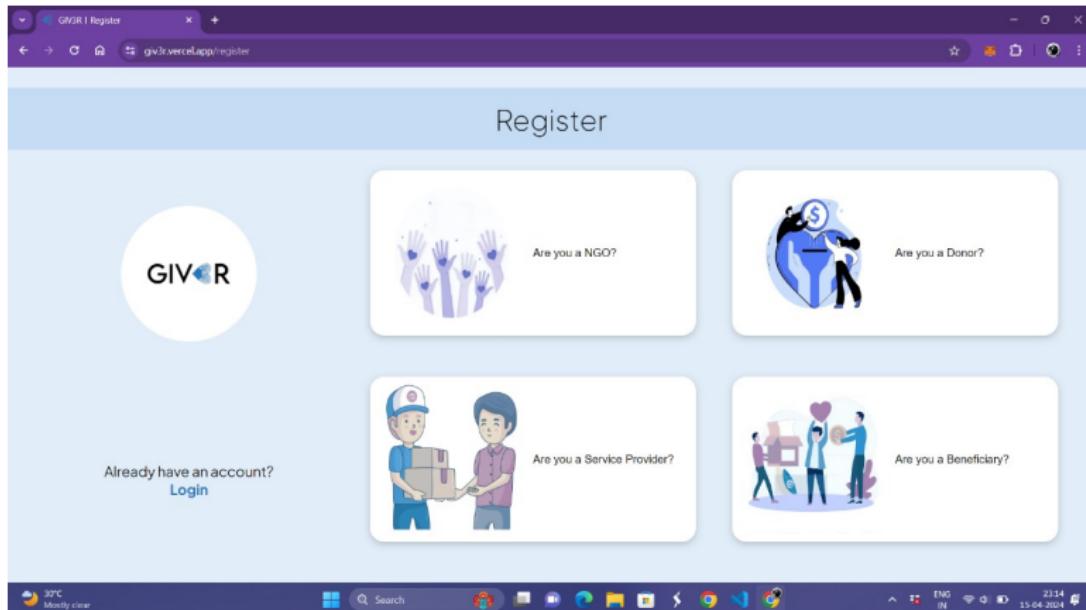


Figure: This is the registration page where users can sign up as an NGO, donor, service provider, or beneficiary.

Result

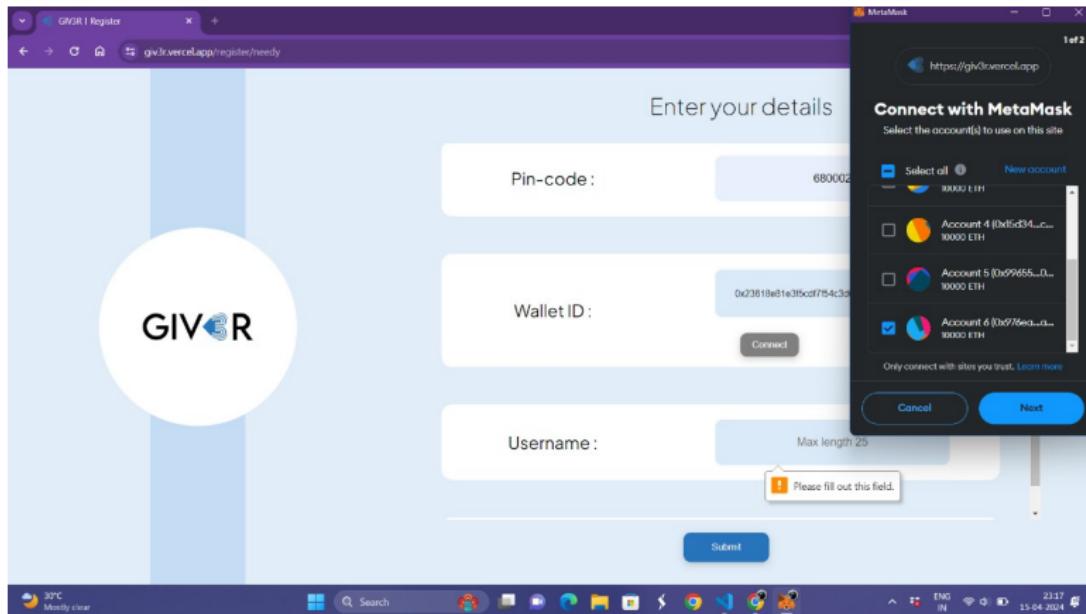


Figure: You can connect your wallet using the wallet ID, and we support the MetaMask wallet.

Result

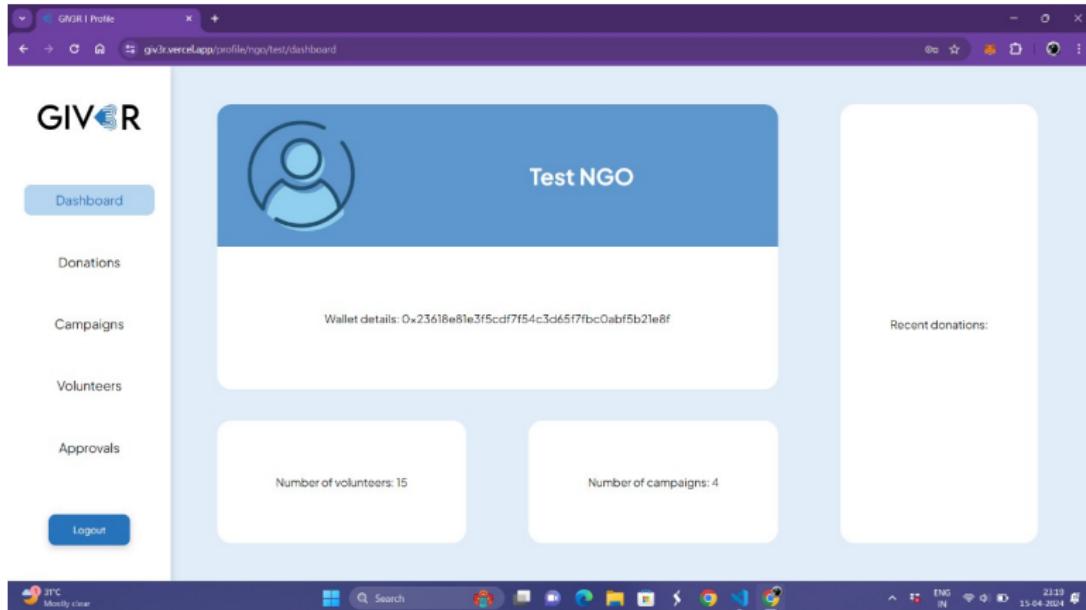


Figure: This is the ngo dashboard.

Result

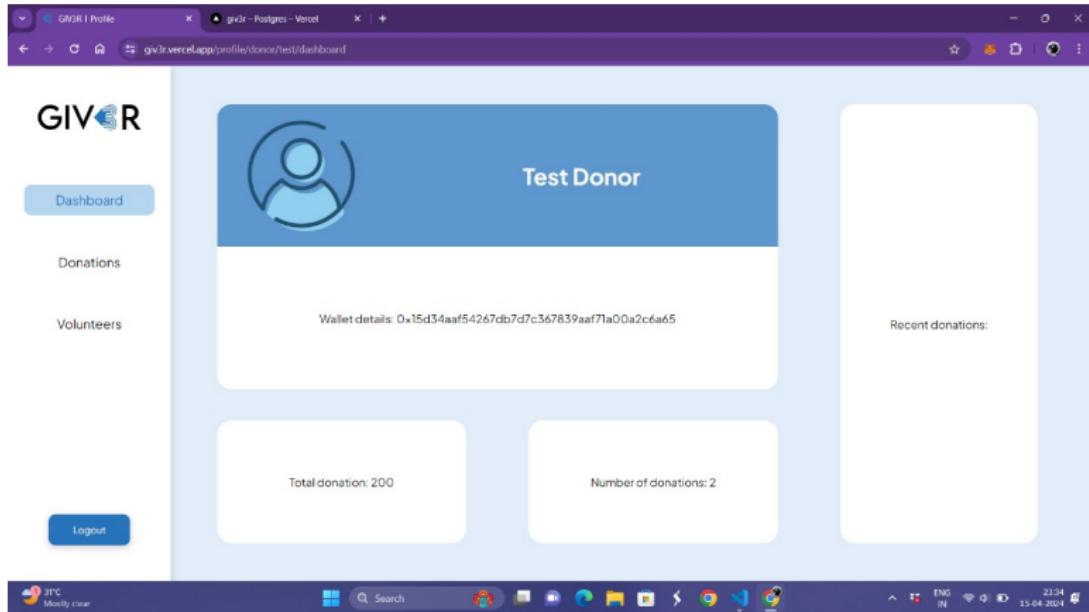


Figure: This is the donor dashboard.

Result

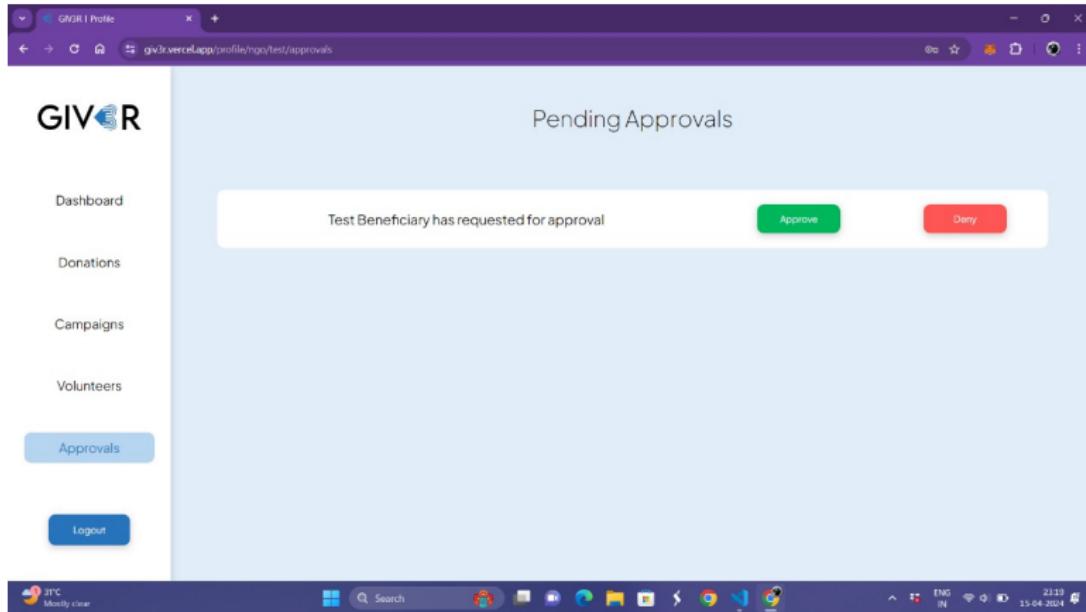


Figure: The pending beneficiary request is approved by the NGOs.

Result

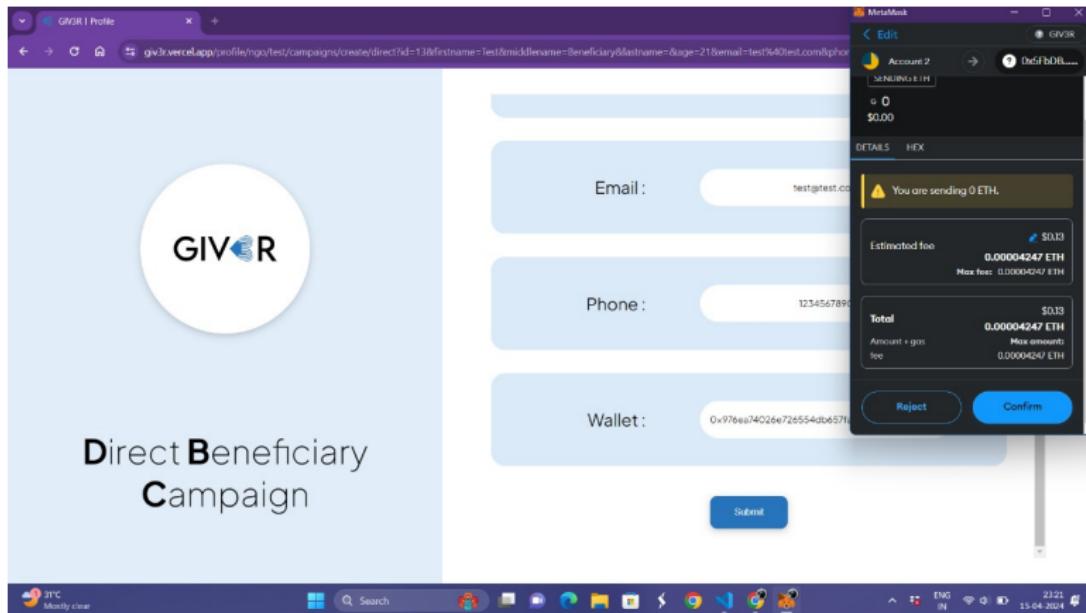


Figure: This is the campaign creation page where you can create a campaign by providing the necessary details.

Result

The screenshot shows a web application interface titled "GIVR Profile". On the left, there is a sidebar with navigation links: "Dashboard", "Donations", "Campaigns" (which is highlighted in blue), "Volunteers", and "Approvals". Below the sidebar is a "Logout" button. The main content area is titled "Active Campaigns" and displays a table of campaign data. The table has columns for ID, Name, Cause, Volunteers, Target, and Raised. The data is as follows:

ID	Name	Cause	Volunteers	Target	Raised
0	Community	flood	10	500	0
1	Food	War	5	100	0
2	Abc	Xyz	0	10	0
3	Test Campaign	Test	0	200	100
4	Test Campaign 2	Testing	0	200	0

A "Create" button is located at the bottom right of the table area. The browser's address bar shows the URL "gvr.vercelapp/profile/ngo/test/campaigns". The system tray at the bottom of the screen includes icons for battery level (31%), network (ENG IN), signal strength, volume, and date/time (15-04-2024 23:22).

Figure: All active campaigns can be viewed by the NGOs.

Result

The screenshot shows a web browser window with two tabs: "GivR Campaigns" and "givR - Postgres - Vercel". The main content area displays a list of campaigns under the heading "Campaigns".

Community (CC)

Name: Test NGO
Address: Thrissur, Kerala, India -680002
Email: test@test.com
Phone: 1234567890
Wallet ID: 0x234567891e3f5c0f7f54c3d6f7fb0abf821e8f
Hosted by Test NGO
[Donate](#)

Food (CC)

Name: Test NGO
Address: Thrissur, Thrissur, Kerala, India -680002
Email: test@test.com
Phone: 1234567890
Wallet ID: 0x234567891e3f5c0f7f54c3d6f7fb0abf821e8f
Hosted by Test NGO
[Donate](#)

Abc (CC)

Name: Test NGO
Address: Thrissur, Thrissur, Kerala, India -680002
Email: test@test.com
Phone: 1234567890
Wallet ID: 0x234567891e3f5c0f7f54c3d6f7fb0abf821e8f
Hosted by Test NGO
[Donate](#)

Test Campaign (DB)

Name: Sagar Alias Jacky
Address: Thrissur, Thrissur, Kerala, India -680002
Email: sa@gmail.com
Phone: 1234567890
Wallet ID: 0x90f796fe6e2c4f8703d5e7815982ef01ef93e0f6
Hosted by Test NGO
[Donate](#)

Test Campaign 2 (DB)

This section is currently empty.

At the bottom, the browser toolbar includes icons for back, forward, search, and various extensions. The status bar shows the date (15-04-2024), time (23:32), and battery level.

Figure: Page where all campaigns can be viewed.

Result

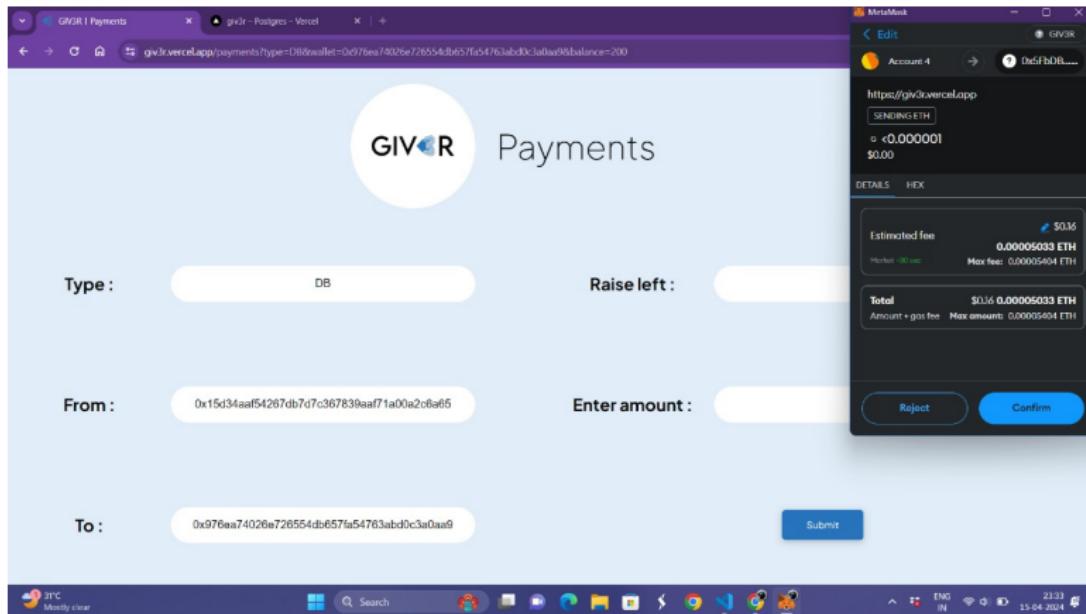


Figure: Payments can be made by entering the corresponding wallet address and the amount to be donated.

Result

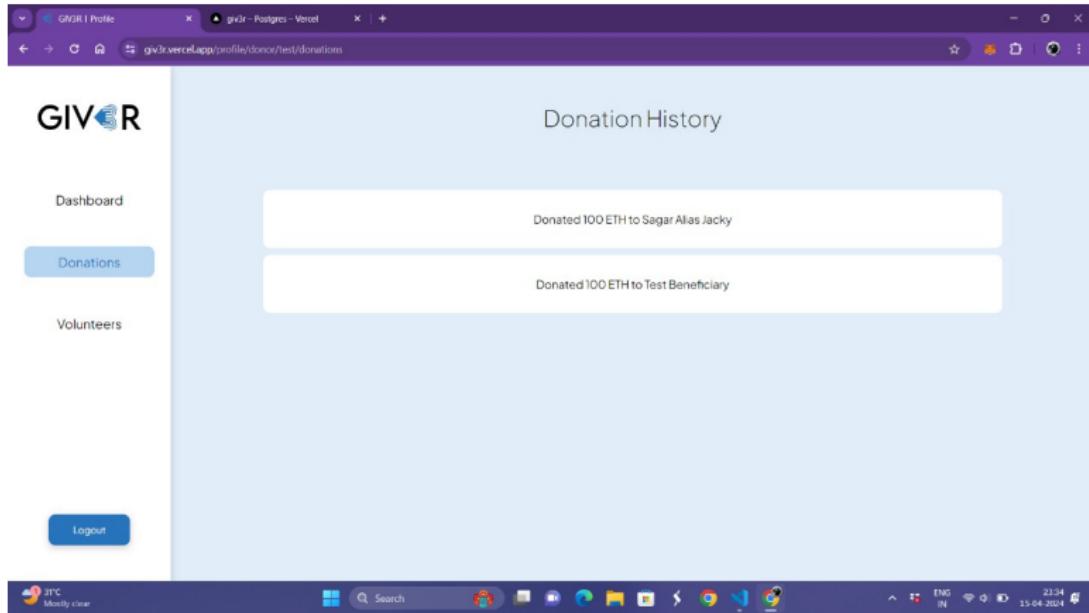


Figure: Each payment made can be tracked using blockchain technology.

Result

The screenshot shows the Etherscan interface for a smart contract at address 0x0CaceAC31Cb6C59Fabee0345782d41b088FDe407. The page is divided into three main sections: Overview, More Info, and Multichain Info. The Overview section shows an ETH BALANCE of 0 ETH. The More Info section shows the CONTRACT CREATOR as 0x6d9e39b0...52Ea7C165, with the creation transaction hash being 0xb11fc9010fe... The Multichain Info section indicates N/A. Below these, there are tabs for Transactions, Internal Transactions (which is selected), Token Transfers (ERC-20), Contract, and Events. The Internal Transactions table lists two recent transactions:

Parent Transaction Hash	Block	Age	From	To	Value
0x5fa1148e869...	5793393	2 mins ago	0x0CaceAC3...088FDe407	0xEb609c37...dd2e1BA0b	0.075 ETH
0xc48ccdb4e5...	5793361	8 mins ago	0x0CaceAC3...088FDe407	0xEb609c37...dd2e1BA0b	0.03 ETH

A note at the bottom explains what a contract address is: "A contract address hosts a smart contract, which is a set of code stored on the blockchain that runs when predetermined conditions are met. Learn more about addresses in our Knowledge Base." There are also links to download the page data as CSV or in ADVANCED MODE.

Figure: Transactions recorded on the Sepolia Test Network

Conclusion

- The decentralized charity platform, driven by Next.js, aims to redefine charitable contributions with **transparency**, **efficiency**, and **community engagement**.
- **Ongoing monitoring**, **user feedback**, and **legal compliance** are pivotal for sustained success and positive impact on philanthropy.

Future Scope

- Enhanced features and functionalities, such as advanced analytics and reporting capabilities.
- Development of a dedicated mobile application for improved accessibility.
- Integration with social media platforms to amplify reach and engagement.
- Partnerships with charitable organizations, NGOs, and corporate entities for greater impact.
- Advanced impact measurement and reporting using AI and ML.

References

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- ② Alexopoulos, N., Daubert, J., Mühlhäuser, M., & Habib, S. M. (2017, August). Beyond the hype: On using blockchains in trust management for authentication. In *2017 IEEE Trustcom/BigDataSE/ICESS* (pp. 546-553). IEEE.
- ③ Mukhopadhyay, U., Skjellum, A., Hambolu, O., Oakley, J., Yu, L., & Brooks, R. (2016, December). A brief survey of cryptocurrency systems. In *2016 14th Annual Conference on Privacy, Security and Trust (PST)* (pp. 745-752). IEEE.
- ④ Lu, Q., & Xu, X. (2017). Adaptable blockchain-based systems: A case study for product traceability. *IEEE Software*, 34(6), 21-27.

THANK YOU