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Blockchain Based Donation Tracking System

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Abstract: ***Secure Lack of transparency and accountability in traditional charitable donation systems often results in donor mistrust and inefficient fund utilization. This paper proposes a blockchain-based donation tracking system that ensures secure, transparent, and immutable handling of charitable contributions.***
The system enables administrators to create verified fundraising events, upload authentication certificates, and define donation goals. Donations are processed through smart contracts and permanently recorded on a decentralized blockchain ledger. This eliminates data tampering, improves donor confidence, and enables real-time tracking of funds.
Experimental evaluation confirms secure transaction handling, transparency, and acceptable performance for real-world deployment.. [1]–[3], [5]
Keywords: Blockchain, Smart Contracts, Donation Tracking, Transparency, Decentralized Applications.

I. INTRODUCTION

Charitable organizations play a significant role in addressing humanitarian and social challenges. However, traditional donation systems suffer from limited transparency, delayed fund tracking, and dependency on centralized authorities. Donors often lack visibility into fund utilization, leading to trust and accountability concerns. [1], [11]
Blockchain technology provides a decentralized, immutable, and transparent framework capable of addressing these issues. Transactions stored on a blockchain cannot be altered, ensuring integrity and traceability. Smart contracts further automate donation processing by executing predefined rules without intermediaries. [2], [4], [9]
This paper presents a blockchain-based donation tracking system that ensures secure donation handling, prevents fund mismanagement, and provides real-time monitoring through verifiable blockchain records. [3], [5], [6]

II. RELATED WORKS

Previous research has explored blockchain applications in financial systems and charitable donations. Existing platforms primarily focus on secure payment processing and transparent transaction records, with some incorporating smart contracts and public dashboards[1], [2], [3], [5], [7]
However, many systems lack event verification mechanisms, comprehensive donor visibility, and real-time fund utilization tracking. Additionally, certificate authentication and role-based access control are often missing. [6], [8], [11], [12]
The proposed system addresses these gaps by integrating verified event certification, transparent fund tracking, and controlled administrative access within a unified blockchain architecture. [4], [9], [13].

III. PROPOSED METHODOLOGY (BLOCKCHAIN)

A. System Architecture

The system follows a decentralized architecture comprising a user interface, a Web3-based API, and a blockchain network. The user interface enables administrators and donors to perform event creation, verification, and donation activities. The Web3 API acts as an interface between the frontend and blockchain, allowing secure interaction with smart contracts. The blockchain network maintains an immutable ledger of all donation transactions, ensuring transparency and tamper resistance:

B. Smart Contract Design

Smart contracts deployed on the blockchain manage the core functionalities of the donation tracking system. These contracts define rules for fundraising event creation, donation acceptance, and transaction recording. Administrators are authorized to register verified events by submitting relevant details and certificates. Once deployed, smart contracts execute autonomously and cannot be altered, ensuring trustless and intermediary-free operation. [4], [6], [10]

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C. Donation Tracking Mechanism

Each donation transaction is processed through smart contracts and recorded on the blockchain with details such as donor wallet address, event identifier, donation amount, and timestamp. Due to the immutable nature of blockchain technology, records cannot be modified, enabling real-time verification and public transparency for all stakeholders. [1], [5], [12]

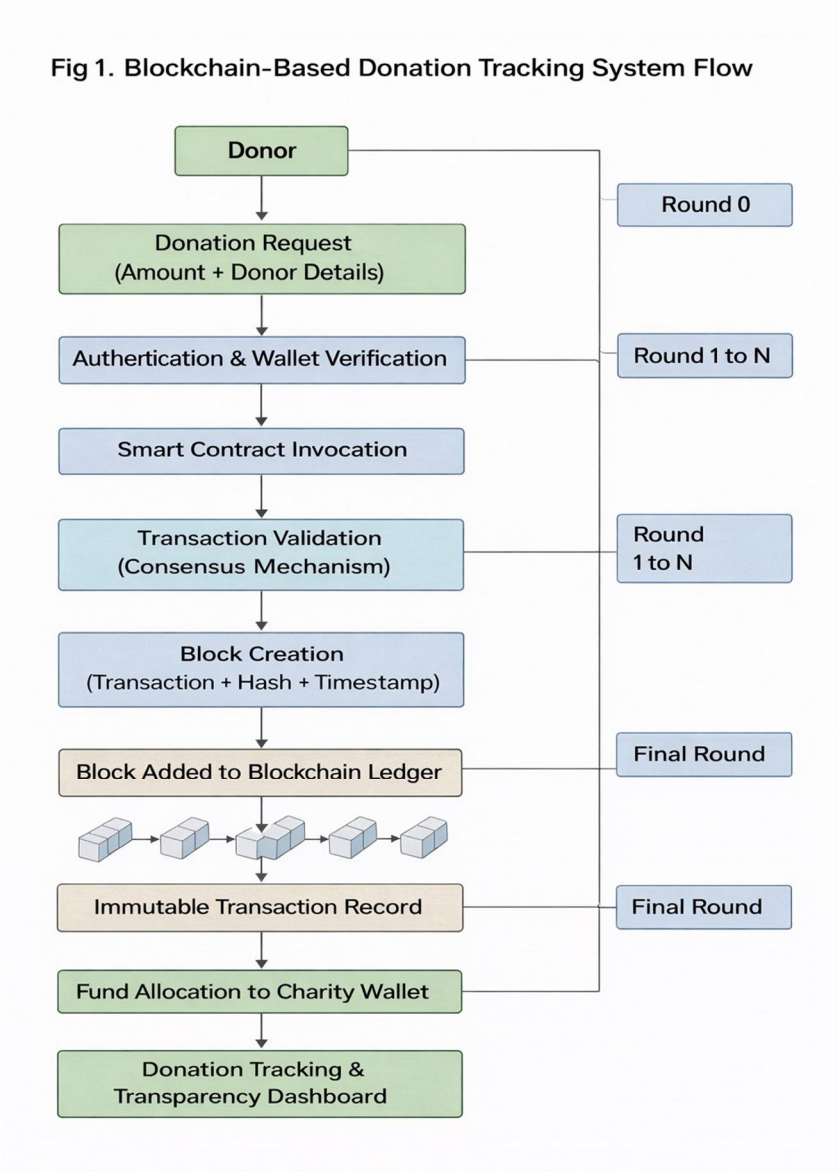


Fig 1. System Flow

The encryption process begins with the selection of a plaintext file by the user, which is then passed to the EE-AES encryption module. The algorithm generates a Dynamic S-Box and applies Bitwise Reverse Transposition to enhance confusion and diffusion before performing the standard AES rounds. These additional steps increase unpredictability and strengthen resistance against cryptographic attacks. The final output is a ciphertext file that maintains confidentiality and can be securely transmitted or stored.

D. Security and Transparency Framework

Security and transparency are achieved using cryptographic mechanisms and decentralized ledger technology. Smart contracts prevent unauthorized access and ensure funds are used strictly for approved purposes. The absence of centralized storage reduces risks of data breaches and manipulation, thereby enhancing donor trust [2], [9], [11]

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IV. SYSTEM WORKFLOW



Fig 2.Workflow

It begins with user input, where administrators create fundraising events and donors access the system to contribute. Once an event or donation request is initiated, the administrator uploads relevant certificates or documents to validate the authenticity of the event. This verification step ensures that only legitimate and approved events proceed further, thereby building trust among donors before any financial transaction occurs.[1][3][5][7]

After verification, the system triggers a smart contract, which defines the rules and conditions for the donation process. The smart contract executes the donation as a blockchain transaction, recording it securely on the network. Each transaction is then stored in an immutable ledger, ensuring transparency, tamper resistance, and auditability. Finally, the system provides real-time donation tracking and display, allowing donors and stakeholders to monitor contributions, fund utilization, and event progress instantly, thereby enhancing accountability and trust in the donation process.. [2][4][12][13]

V. PRELIMINARY RESULT AND ANALYSIS (PHASE 1)

Phase I evaluation confirmed successful event registration, secure donation processing, and immutable transaction storage. Smart contracts enforced predefined rules and prevented unauthorized actions. The decentralized architecture improved reliability and eliminated centralized control. Transaction confirmation times remained acceptable under normal conditions.

VI. ISSUES IDENTIFIED AND RESOLUTION

Issue 1: High Transaction Costs During Network Congestion
Resolution: Optimized smart contract logic to reduce gas consumption and transaction fees.[2][4][12]
Issue 2: Limited User Familiarity with Blockchain Technology
Resolution: Implemented a guided, user-friendly interface to simplify blockchain interactions.[8][9][10]
Issue 3: Event Authenticity and Trust Concerns
Resolution: Enforced mandatory certificate verification before event registration.[1][3][6][11][13]

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VII. RESULT AND ANALYSIS

The proposed blockchain-based donation tracking system was implemented and evaluated to analyze its effectiveness in enhancing transparency, security, and accountability in charitable donation management. The evaluation was conducted using multiple simulated fundraising events and donor interactions to ensure reliability under different operational scenarios. The system was tested for functional correctness, transaction integrity, and transparency of fund flow. Experimental results demonstrate that the proposed approach successfully records donation transactions in an immutable manner, enforces secure access control through smart contracts, and provides real-time visibility of donation activities. The obtained results confirm that the system achieves its intended objectives while maintaining acceptable performance for practical deployment.

A. Functional Validation

The system successfully registered verified events and processed donation transactions without data loss. Transaction details retrieved from the blockchain matched original inputs, confirming correct smart contract execution

B. Security Analysis

1) Immutability: All donation transactions are permanently recorded on the blockchain, preventing data modification and ensuring tamper-proof and verifiable records..

2) Smart Contract Enforcement:

Smart contracts automatically control event creation and donation processing, allowing only authorized actions and blocking fraudulent or invalid transactions. .

C. Transparency and Trust

Real-time public visibility of donation records enables independent verification by donors, improving transparency, accountability, and overall trust in the system.Despite this overhead, the encryption and decryption times remain within acceptable limits for file-level security applications.

D. Result Summary

The experimental results demonstrate that the proposed blockchain-based donation tracking system successfully ensures transparent and tamper-proof recording of donation transactions. The integration of smart contracts effectively enforces secure access control and prevents unauthorized fund manipulation.

Overall, the system achieves improved transparency, accountability, and reliability while maintaining acceptable performance, making it suitable for real-world charitable donation applications

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VIII. USER INTERFACE LAYER

ThThe system provides a simplified User Interface Layer that enables users to interact with the blockchain-based donation tracking system efficiently. The interface allows administrators to create and manage fundraising events, upload verification certificates, and monitor donation activities, while donors can view verified events and initiate donations securely. Designed with usability in mind, the interface presents clear instructions and real-time status updates for each stage of the donation process, ensuring smooth interaction and operational clarity. All blockchain operations—such as donations and transaction verification—are handled internally via smart contracts and a Web3 layer, keeping sensitive data secure and reducing the risk of unauthorized access or manipulation.

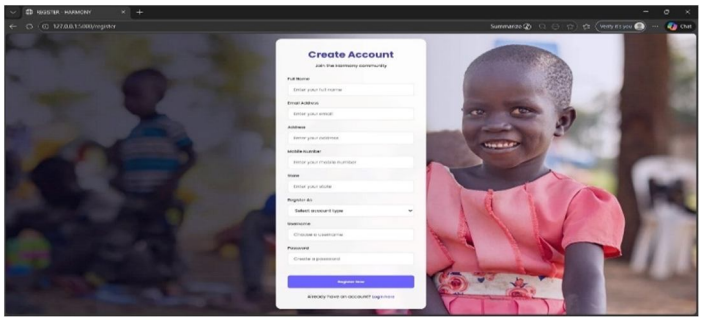


Fig 3.Sign Up

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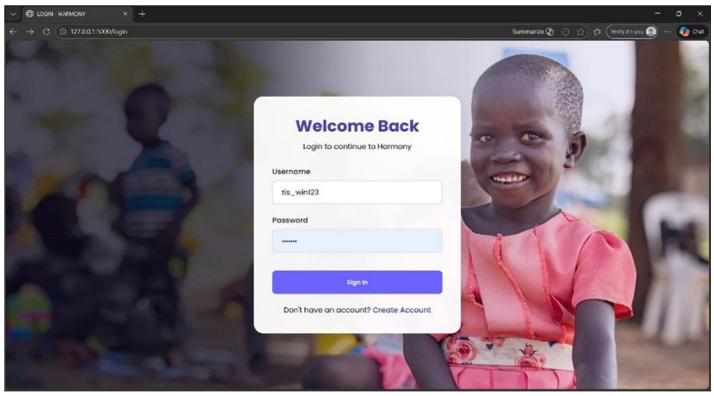


Fig 4. Login

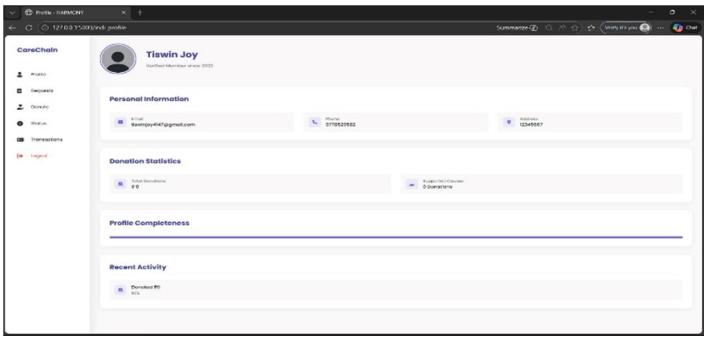


Fig 5.Dashboard

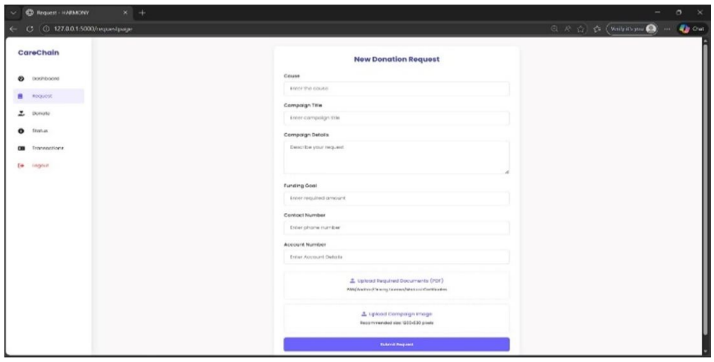


Fig 6. Donation Request Page

IX. CONCLUSION

This paper presented a blockchain-based donation tracking system designed to enhance transparency, accountability, and security in charitable fundraising. By leveraging blockchain immutability and smart contracts, the system ensures tamper-proof donation management and real-time fund tracking. Experimental results confirm that the proposed solution is secure, reliable, and suitable for real-world charitable applications.[1][6][9][13]

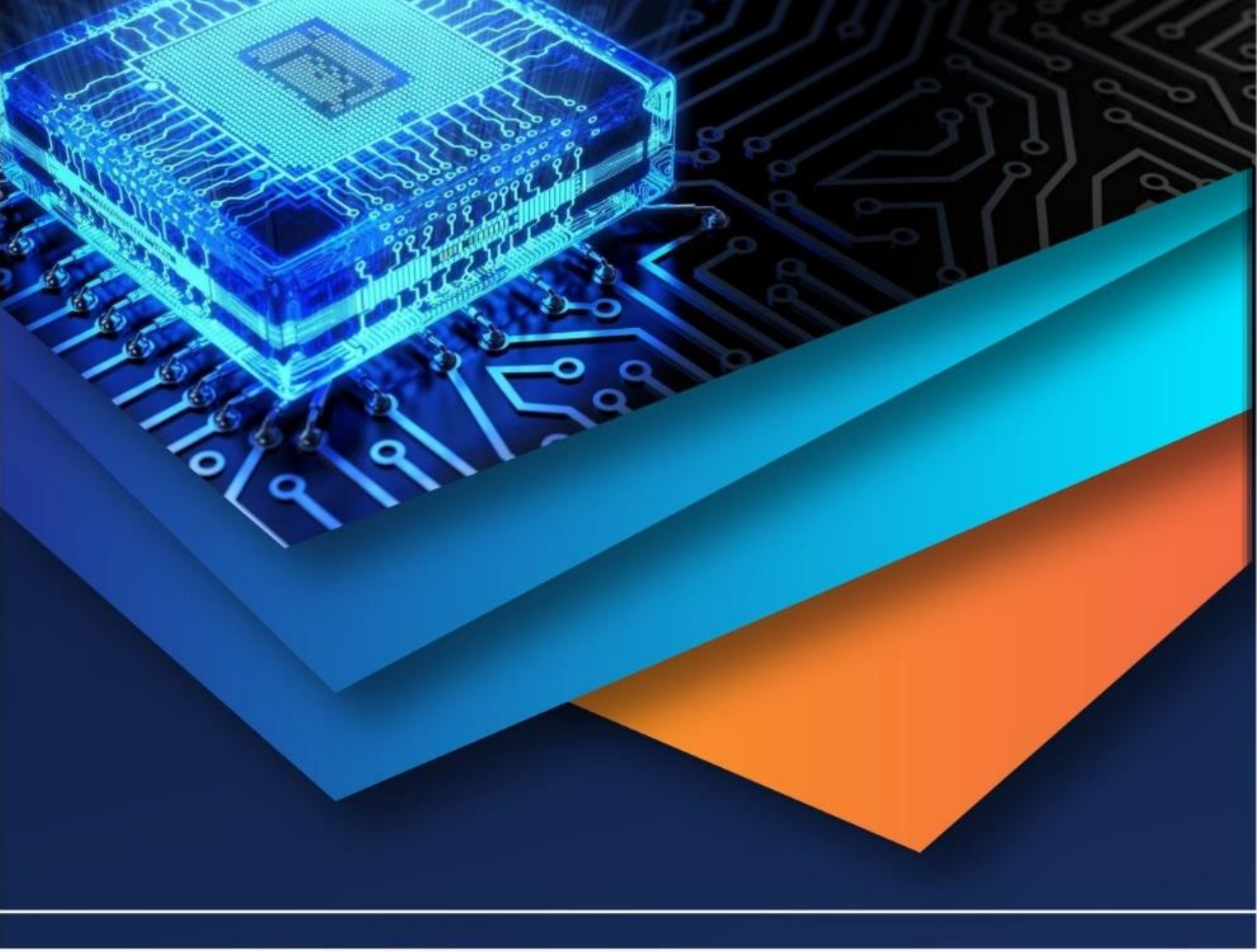
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REFERENCES

[1] P. Pawar, G. Rajukar, N. Gaikwad, A. Bute, and S. Kirve, "Tracking donations of charitable foundations using blockchain technology," International Journal of Advanced Research in Computer and Communication Engineering, vol. 10, no. 5, pp. 95–100, May 2021..
[2] W. Liu, Y. Li, X. Wang, Y. Peng, W. She, and Z. Tian, "A donation tracing blockchain model using improved DPoS consensus algorithm," Peer-to-Peer Networking and Applications, vol. 14, no. 5, pp. 2789–2800, 2021.A. Almaghrabi and A. Alhogail, "Blockchain-based donations traceability framework," Journal of King Saud University
[3] A. Almaghrabi and A. Alhogail, "Blockchain-based donations traceability framework," Journal of King Saud University – Computer and Information Sciences, vol. 34, no. 10, pp. 9442–9454, 2022.J. Karthika, S. Keerthana, and A. Shali, "Blockchain based transparent donating system," Journal of Information Technology and Digital World, vol. 5, no. 2, pp. 115–124, Jun. 2023..
[4] R. R. Ullah Mir, Y. A. A. Kalaji, R. W. Ahmad, and A. R. Khan, "Blockchain-based system for end-to-end donations monitoring," in Proceedings of the 24th International Arab Conference on Information Technology (ACIT), IEEE, 2023, pp. 1–6.S. Chougule, A. Avasarikar, A. Kapile, and Y. Bhavsar, "Blockchain based distributed fundraising platform," International Journal for Research in Applied Science and Engineering Technology, vol. 12, no. 4, pp. 321–326, 2024.
[5] J. Karthika, S. Keerthana, and A. Shali, "Blockchain based transparent donating system," Journal of Information Technology and Digital World, vol. 5, no. 2, pp. 115–124, Jun. 2023..
[6] S. Mariyam, S. Singh, F. A. Khan, and K. Anis, "A blockchain-based framework for enhancing transparency and traceability in charity donations," International Journal of Advanced Research in Computer Science, vol. 16, no. 2, pp. 1–6, 2025.
[7] S. Chougule, A. Avasarikar, A. Kapile, and Y. Bhavsar, "Blockchain based distributed fundraising platform," International Journal for Research in Applied Science and Engineering Technology, vol. 12, no. 4, pp. 321–326, 2024..
[8] Y. Wang and J. Dabboussi-Gürman, "Problem definition and identification in donation blockchain systems," in Proceedings of the ACM International Conference, 2024, pp. 1–5. .
[9] S. Kaur, P. D. Kaur, and S. K. Sood, "Blockchain-oriented effective charity process during pandemics and emergencies," IEEE Transactions on Computational Social Systems, vol. 11, no. 1, pp. 55–66, 2024
[10] S. K. R., "Transparent giving: Revolutionizing donation management with blockchain," International Journal for Research in Applied Science and Engineering Technology, vol. 12, no. 12, pp. 210–215, Dec. 2024.
[11] "Effect of blockchain-based donation systems on trustworthiness of non-profit organizations," Information & Management, vol. 60, no. 5, pp. 1–12, 2023.
[12] Smart blockchain networks: Revolutionizing donation tracking in Web 3.0," Computer Communications, vol. 228, pp. 1–10, Dec. 2024.
[13] M. Sahithi, R. Varsha, L. Dhanya, and M. Nambiar P. V., "A blockchain-based solution for transparent charity donations," International Journal of Engineering Research & Technology, vol. 14, no. 5, pp. 98–103, May 2025.
[14] Amal Jyothi College of Engineering, "Blockchain-based volunteer and donation management system with enhanced transparency and security," in Proceedings of the National Conference on Emerging Computing Applications (NCECA), 2025.

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