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Blockchain Technology – Fundraising Tracking System Using Blockchain

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Abstract : This abstract introduces a fundraising tracking system leveraging blockchain technology. The proposed system aims to enhance transparency, security, and efficiency in fundraising processes. By utilizing blockchain's decentralized ledger, the system ensures a tamper-resistant and auditable record of transactions. Smart contracts facilitate automated and trustless execution of fundraising agreements. Through the integration of cryptographic techniques, donor privacy is maintained while promoting accountability. The implementation of this system has the potential to revolutionize fundraising practices, fostering a more secure and transparent ecosystem for charitable endeavors.

This abstract outlines a tracking system harnessing the power of blockchain technology. The system is designed to provide a decentralized, transparent, and secure means of tracking various entities or processes. Leveraging blockchain's immutable ledger, the system ensures the integrity of data records. Smart contracts automate and enforce predefined rules, streamlining tracking operations. The decentralized nature of blockchain enhances resistance to tampering, offering a robust solution for industries where accurate and unforgeable tracking is crucial. This proposed system holds promise for revolutionizing tracking applications across diverse domains.

INTRODUCTION

The current charity and donation processes are opaque. Due to inadequate record-keeping practices and the presence of dishonest actors within social organizations, there has been a significant erosion of trust among donors. This distrust stems from a lack of transparency regarding how their contributions are utilized. The proposed system offers a solution by allowing social organizations to efficiently manage their projects for social causes without the need for intermediaries. Through the implementation of a smart contract, the system ensures transparency and accountability, thus confirming the impact of the organization's activities. Moreover, this system is accessible to all stakeholders, fostering greater transparency and trust. Donors can easily monitor the transactions of these organizations, thereby restoring their confidence in supporting such social initiatives.

Supporters can effortlessly monitor an organization's financial transactions, aiding in the restoration of their trust in these social entities. The system assures that the donation reaches the intended recipient while lowering speed and efficiency. It will also assist to foster confidence among donors and recipients involved in the charitable process.

1.1 Transparent: Ethereum, being a decentralized and open-source blockchain equipped with smart contract capabilities, facilitates the involvement of anyone. Every transaction is recorded in a publicly accessible ledger, ensuring that donors of a particular campaign can view them. With all transactions visible to participants, our system guarantees complete transparency, safeguarding against misuse by intermediaries.

1.2 Global: Thanks to the peer-to-peer architecture of the network, funds can be swiftly delivered to any corner of the globe (provided the recipient is a participating node), eliminating the inconvenience associated with conventional international bank transfers.

1.3 Decentralized: Without a central authority overseeing transactions, blockchain transactions occur with remarkable speed. Unlike transactions involving traditional currencies, which often require navigating through various intermediaries and centralized exchanges, blockchain transactions are direct and efficient.

Secure: As funds grow in size, their safety becomes increasingly paramount. Despite the implementation of robust security measures such as symmetric and asymmetric encryption, e-payments remain vulnerable to hackers. This susceptibility is evidenced by numerous instances of crowdfunding fraud that have been uncovered, with many more likely remaining undetected. The lack of transparency regarding the utilization of donations further exacerbates the risk of financial theft. To address this issue, we aim to ensure complete visibility of the entire cash flow at every level, thereby mitigating the potential for fraudulent activity

Fig (I) : System Architecture

NEED OF THE STUDY.

The establishment of large hospitals where hundreds to thousands of patients are treated , it has created a serious problems of biomedical waste management. The seriousness of improper biomedical waste management was brought to the light during summer 1998. In India studies have been carried out at local / regional levels in various hospitals, indicate that roughly about 1-5 kg/bed/day to waste is generated. Among all health care personnel ,ward boys , sweepers, operation theatre & laboratory attendants have come into contact with biomedical waste during the process of segregation , collection, transport, storage & final disposal . The knowledge of medical , paramedical staff & ward boys , sweepers about the biomedical waste management is important to improve the biomedical waste management practices. The biomedical waste requiring special attention includes those that are potentially infectious , sharps ,example needle , scalpels , objects capable of puncturing the skin , also plastic ,pharmaceutical & chemically hazardous substances used in laboratories etc.

II.LITERATURE SURVEY

The emergence of blockchain technology and cryptocurrencies represents a potentially disruptive innovation for financial systems, economics, and governance. A review of scholarly literature reveals increasing attention to foundational concepts, technical underpinnings, and potential applications. However, many aspects of blockchain and cryptocurrencies remain understudied.

A significant portion of current literature focuses on the technical architecture and cryptographic principles enabling trustless, decentralized consensus and distributed ledgers. Research outlines the capabilities of blockchain for verifying transactions, executing smart contracts, and creating transparency. However, few studies delve into the processes and challenges involved in implementing blockchain solutions.

While often portrayed as decentralized, peer-to-peer systems, scholars note blockchain networks and cryptocurrencies frequently rely on concentrated mining pools, exchanges, and developers. Literature examining the economics, incentives, governance, and regulation of blockchain systems is still nascent. Additionally, the environmental sustainability of energy- intensive consensus protocols warrants further examination.

Regarding applications, scholarly interest in cryptocurrency as money and payments continues to grow. But reviews reveal inadequate evidence on benefits and adoption barriers for consumers and merchants. Literature also explores blockchain for cybersecurity, supply chain tracking, identity management, and smart contracts. However, use cases beyond finance and transactions remain conceptual.[1]

Crowdfunding has become a popular alternative funding avenue for entrepreneurs and startups, facilitated by online platforms. However, high failure rates of crowdfunded campaigns suggest a need to examine success factors. The literature differentiates conventional reward, equity, and lending models from blockchain-enabled variations utilizing cryptocurrencies and smart contracts.

A key distinction lies in blockchain's potential to remove intermediaries via transparent accounting on a decentralized ledger. Scholars argue lower intermediation costs could benefit issuers and funders, yet evidence on how disintermediation impacts crowdfunding success remains inconclusive.[2] The complexity of blockchain technology is another differentiator. Adoption barriers like cryptocurrency volatility and user unfamiliarity may hinder issuers. Research stresses the importance of marketing to convey benefits and provide participants with clear instructions. Community engagement also emerges as an important success factor for both models.[2]

Crowdfunding has emerged as an innovative model for early-stage fundraising, facilitated by online platforms. However, high intermediation costs and fraud risks burden both fundraisers and contributors. Recent scholarship explores the potential of blockchain-based smart contracts to mitigate these issues and transform crowdfunding. A predominant focus examines the prospects for disintermediation via decentralized ledger technology. Removing third parties could reduce platform fees and costs through automated governance and transparency. However, the literature notes blockchain introduces complexities around cryptocurrencies, identity management, and contract programming. User adoption challenges persist.

Technical dimensions of smart contract implementation receive significant attention. Papers assess design patterns, audibility, and approaches to encoding crowdfunding logic into immutable programmatic contracts. However few empirical studies examine actual deployment. Open questions remain around security, flexibility, and limitations in real-world contexts.

The governance and sustainability of decentralized crowdfunding networks represent additional areas requiring further inquiry. Scholarship contemplates the risks of fraud and manipulation in the absence of centralized authority. Comparative assessments of governance tradeoffs in traditional vs. blockchain models are lacking. There is also scant evidence on the environmental impact of blockchain-based crowdfunding.[3]

Emerging scholarship explores synergies between blockchain technology and software engineering. Papers emphasize designing appropriate programming abstractions and architectures for blockchain systems. This literature underscores the complexity of blockchain protocols and smart contract programming models. Papers argue blockchain software demands novel design approaches accounting for decentralization, cryptography, consensus rules, and peer-to-peer networks. Iterative, user-centric methods are advised to manage this complexity. Literature also advocates formal verification to ensure correctness and security in blockchain programs.

Regarding implementation, prevailing studies focus on blockchain programming languages, tools, and platforms. Comparisons reveal tradeoffs in expressiveness, safety, and ease of use. Research on reusable components and libraries to simplify development is limited. As blockchain software matures, research that informs both design and structured programming practices will remain important.[5]
Emerging literature explores blockchain's potential to secure and enhance IoT systems in industrial environments. A predominant focus examines using blockchain to enable trusted machine-to-machine communication and automation. Papers propose blockchain architectures and protocols tailored for industrial IoT networks. Research on blockchain-IoT integration cites benefits including decentralized identity management, encrypted data exchange, and integrity verification for sensor readings. However, studies also acknowledge adoption barriers in complex industrial settings. Challenges include scalability, privacy, and interoperability with legacy systems.
While conceptual models abound, empirical evidence on actual blockchain IoT implementations remains limited. Most studies are restricted to simulated proofs-of-concept. Scholars emphasize a need for real-world pilot studies and testing across industrial use cases. The impact on efficiency, safety, and cost- savings compared to traditional IoT also requires further inquiry.[7]

III.MOTIVATION AND DEFINATION

A fundraising tracking system leveraging blockchain technology serves as a transformative solution to address challenges in traditional fundraising methodologies. Motivated by the need for heightened transparency, security, and efficiency in fundraising campaigns, this system employs blockchain's decentralized and tamper-resistant ledger to redefine how financial transactions are recorded and managed.

Motivation:

1. **Enhanced Transparency**:- Strives to build trust among stakeholders by providing a transparent and immutable record of all fundraising transactions. Donors can independently verify the flow of funds, ensuring their contributions are used as intended.

2. **Security and Immutability:-**Aims to eliminate the risk of fraud and unauthorized alterations in financial records. By utilizing blockchain's cryptographic principles, the system ensures that once a transaction is recorded, it cannot be tampered with or altered, enhancing the overall security of the fundraising process.

3. **Decentralization:-**Seeks to reduce reliance on centralized intermediaries, fostering a decentralized ecosystem where transactions are verified by a distributed network of nodes. This decentralization not only enhances security but also minimizes the risk of a single point of failure.

4.**Efficiency through Smart Contracts**:- Introduces smart contracts to automate and enforce predefined rules for fundraising activities. This automation reduces administrative overhead, accelerates fund disbursement, and ensures that funds are released based on transparent and predetermined conditions.

IV.DATABASE AND REQUIREMENTS

A fundraising tracking system leveraging blockchain technology requires a robust database structure and specific functional requirements to ensure its effectiveness.

Database Structure:

1. User Profiles:
   - Capture and store information about donors, beneficiaries, and other stakeholders.
- Include details such as name, contact information, and wallet addresses.
2. Transaction History:
- Record all financial transactions related to fundraising activities.
   - Include details like transaction ID, timestamp, amount, and involved parties.
3. Smart Contracts:
- Store smart contracts governing fundraising rules and conditions.
   - Include parameters defining when and how funds are released based on predefined criteria.
4. Blockchain Integration:
   - Integrate with a blockchain network for decentralized and secure storage of data.
- Utilize blocks to timestamp and link transactions, ensuring immutability.

5. Event Logging:
   - Maintain logs of significant events, such as campaign launches or fund disbursements.
- Include timestamps and details about the nature of each event.

Functional Requirements:

1. User Authentication:
   - Implement secure authentication mechanisms for users to access and interact with the system.

2. Donation Processing:
   - Facilitate the acceptance of various forms of donations, including cryptocurrencies and traditional fiat currencies.

3. Fund Disbursement Logic:
   - Define clear rules through smart contracts on when and how funds are released to beneficiaries.

4. Real-time Tracking:
   - Provide real-time updates on fundraising progress, displaying the current amount raised and the remaining goal.

5. Transparency and Auditability:
   - Ensure transparency by allowing stakeholders to trace every transaction and verify the legitimacy of the fundraising process.

6. Security Measures:
   - Implement encryption protocols to safeguard sensitive user information and financial data.

7. Integration with Payment Gateways:
   - Enable integration with external payment gateways to facilitate seamless transactions.

8. Reporting and Analytics:
   - Generate reports on fundraising performance, donor engagement, and other relevant metrics.

9. Notifications:
   - Implement a notification system to update stakeholders on important events, such as successful donations or campaign milestones.

10. User Feedback and Reviews:
    Allow donors to provide feedback and reviews, fostering transparency and accountability.

By integrating these elements into the fundraising tracking system, the database can efficiently manage the flow of funds while the blockchain ensures security, transparency, and immutability of the transactional data.

V. METHODOLOGY

The methodology for fundraising tracking system using blockchain can be divided into several key steps:

1. Define Objectives and requirements : Clearly outline the goals of the fundraising tracking system. Identify the specific requirements, such as transparency, security, and real-time tracking.
2. Design Architecture : Plan the system's architecture, including the blockchain network structure .Choose the appropriate blockchain platform (e.g., Ethereum, Hyperledger, or a custom solution).
3. Smart Contract Development : Create smart contracts for fundraising campaigns, donations, and disbursements.Ensure that the smart contracts execute automatically based on predefined conditions.
4. User Registration and Verification : Implement a user registration process with identity verification.link user identities to blockchainwallet addresses for transparency.
5. Tokenization : Create tokens (e.g., ERC-20 tokens) to represent contributions. Distribute tokens to donors when they make contributions.
6. Donor Interaction : Develop a user friendly interface for donors to make contributions using cryptocurrencies or fiat.Update the blockchain ledger in real-time with donor information and contributions.
7. Track and Verify Transactions : Implement real-time tracking of contributions and disbursements.Allow donors and campaign creators to verify transactions on the blockchain.

8. Compliance and Legal Considerations : Ensure compliance with relevant regulations and laws, especially if the project involves fundraising for nonprofits or charitable causes.
9. Testing and Quality Assurance : Thoroughly test the system for func tionality, security, and performance. Conduct user acceptance testing to gather feedback.
10. Deployment : Deploy the system to the blockchain network of choice. Make it accessible to campaign creators and donors.

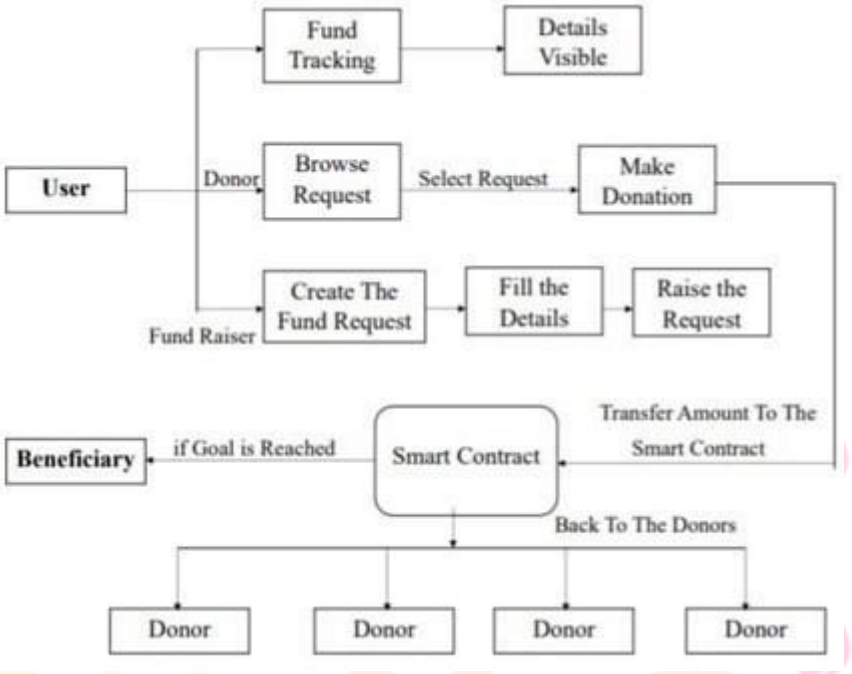

Fig (II) : Data Flow Diagram

CONCLUSION

The Donation Tracking System, developed on the Ethereum blockchain, facilitates monitoring transactions made by donors and accessing details regarding the allocation of those funds.Smart contracts with blockchain implementation assist in directing the movement of ethers between the end parties engaged in the transaction directly without the intervention of a third party. The system accepts donations in the form of ETH. Because each transaction is distinct, it is simple to monitor it along the blockchain. A high degree of transparency and integrity in such systems may offer people trust and cooperation, encouraging them to donate and enhance the reputation of generous giving.

Future work:- The field of Fundraising Tracking System Using Blockchain Project holds immense potential for future development and improvement. Here are some areas of future work and opportunities to enhance the systems.

IV. RESULT AND ANALYSIS

Utilizing blockchain technology, donation tracking systems can establish an unchangeable record of all contributed donations, guaranteeing their intended recipients receive them. Such transparency fosters greater confidence in the charitable domain, potentially inspiring increased contributions to deserving endeavors.

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