Blockchain Application For Transparency And Accuracy Charitable Activities In Vietnam

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Abstract

The blockchain technology in the charity sector is a promising initiative, which is a new boom, bringing transparency and safety to all publicly recorded and non-modifiable transactions in the controller's ledger. Although this technology has been applied, it is not yet popular in Vietnam because of more difficulty to control transactions and the mechanism of operation is difficult. The legal basis of blockchain in Vietnam has not yet been widely disseminated. Blockchain technology can help improve the traceability and transparency of donations through distributed ledger. This system is built on Node.js written in JavaScript; the algorithms required for the system. This article will build a complete system of blockchain technology for charities and donors to bring high efficiency. We propose three main functions in the charity of funding transaction process including: transparency, decentralization, safety and security. Using blockchain can help increase contributor trust and ensure that their funds are used for the right purpose. With the development of blockchain technology, we can enter a future where philanthropy is more transparent and efficient.

Research Purpose:

The primary purpose of this research is to propose a blockchain-based system aimed at enhancing traceability, transparency, and security in the charity sector. This system seeks to address current inefficiencies in managing and verifying charitable donations by leveraging the benefits of blockchain technology to ensure that all transactions are immutable, publicly recorded, and efficiently managed.

Research Motivation:

The motivation behind this study stems from the limitations of traditional information management systems in charitable organizations, which often face challenges in providing transparent and efficient tracking of funds. Blockchain technology offers a promising solution to these issues, yet its adoption remains limited in Vietnam due to regulatory hurdles and complexities in implementation. This research aims to explore the potential of blockchain to overcome these challenges, particularly in the context of the charity sector.

Research Design, Approach, and Method:

The study employs a design and development approach, utilizing Node.js and JavaScript to build a blockchain system that ensures transparency, decentralization, and security in charitable transactions. The

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system is designed to manage the flow of donations through a distributed ledger, implementing key blockchain algorithms to safeguard transactions and improve accountability. This research follows a system-oriented method, focusing on practical implementation and performance evaluation of the blockchain system in a charity context.

Main Findings:

The research reveals that the application of blockchain technology in the charity sector significantly enhances transparency and trust among donors. The decentralized and secure nature of blockchain ensures that donations are traceable, reducing the risk of misallocation and increasing overall operational efficiency. The system also contributes to improved trust between donors and charitable organizations by ensuring that funds are used for their intended purposes.

Practical/Managerial Implications:

The findings suggest that charitable organizations can benefit from adopting blockchain technology to streamline donation processes, increase transparency, and strengthen donor relationships. By implementing blockchain systems, organizations can reduce administrative overhead, mitigate risks of fund misuse, and enhance their overall reputation, potentially leading to increased contributions and better operational outcomes.

Keywords:
Blockchain, charitable donations, transparency, decentralization, security, distributed ledger

1. INTRODUCTION

Charitable giving has long been an essential aspect of social support, yet the lack of transparency and traceability in donation management remains a significant issue. Donors often face uncertainty about the use of their donations, leading to a loss of trust and a reluctance to give. This challenge is particularly evident in underdeveloped and developing countries, where weak governance structures exacerbate the risk of fraudulent activities in charities [1]. Blockchain technology, with its decentralized and immutable ledger, offers a transformative solution to these transparency issues. By allowing all transactions to be recorded securely and publicly verifiable, blockchain can restore donor trust and ensure that donations are used for their intended purposes. Despite its potential, the adoption of blockchain in the charity sector, especially in Vietnam, remains limited due to the complexity of implementation and the lack of a supporting legal framework [2].

This paper explores the application of blockchain technology to enhance transparency and accuracy in charitable activities in Vietnam. We propose a blockchain-based system, called ICHARITY, designed to address the critical issues of trust and accountability in the donation process. The system aims to provide a secure, transparent platform for transactions between donors and non-governmental organizations (NGOs), thus ensuring that all funds are used effectively [3].

Existing blockchain applications, such as Binance Charity Foundation (BCF) and the World Food Programme’s Building Blocks project, have demonstrated the potential of blockchain to revolutionize charity fund management [4]. These initiatives allow all transactions to be public and verifiable, enhancing transparency and accountability. However, there is still a gap in academic research on how such technologies can be effectively adapted to meet the unique needs and challenges of the charity sector in Vietnam. The main objective of this study is to develop and evaluate a blockchain-based system that can improve the transparency and accuracy of charitable donations in Vietnam. We hope to address the current problems of donation tracking systems in Vietnam and at the same time apply Blockchain technology to the charity system. The paper also presents the challenges and benefits of implementing the system in Vietnam.

2. LITERATURE REVIEW

Blockchain technology, known for its decentralized, secure, and immutable characteristics, has emerged as a transformative force across industries. In the realm of charitable activities, blockchain promises to address long-standing issues such as transparency, accountability, and the efficient use of donations. This section reviews relevant studies and literature that have explored the intersection of blockchain technology and charitable activities.

Blockchain is a distributed ledger technology (DLT) that enables secure, transparent, and tamper-resistant transactions. According to Nakamoto (2008), blockchain operates on a peer-to-peer network, where transactions are validated by consensus mechanisms such as proof-of-work or proof-of-stake. These features ensure the accuracy and integrity of the data, as every transaction is recorded chronologically and publicly, preventing unauthorized alterations. Many scholars have highlighted the potential of blockchain to enhance trust and reduce fraud across various sectors, including supply chains, healthcare, and financial services (Zheng et al., 2017; Mougayar, 2016).

Blockchain in charitable activities: Charitable organizations often face criticism for lack of transparency and inefficiencies in fund allocation (Breeze, 2013). Blockchain's decentralized ledger can provide a transparent system where donors can track their donations in real-time, ensuring that funds reach their intended beneficiaries without intermediaries manipulating or diverting resources. Several studies have investigated the application of blockchain in the non-profit sector. For instance, Wright and Filippi (2015) examined how blockchain could offer a secure, open record of transactions, increasing trust between donors and charitable organizations. Blockchain's ability to trace donations from the donor to the end recipient is a critical factor in building confidence and reducing fraud, corruption, and misuse of funds. Similarly, Svečnjak et al. (2021) identified blockchain as a solution to the opaque nature of traditional charity systems, suggesting that its transparency can significantly improve the perception of charities, leading to increased donor participation. In Vietnam, there is a growing interest in utilizing blockchain to enhance charitable activities. Nguyen and Pham (2020) explored blockchain's potential to improve the efficiency and credibility of Vietnam's charitable sector, especially considering instances of misuse and lack of clarity in existing charitable activities. However, they noted that while the technology holds promise, the adoption rate remains slow due to technological, regulatory, and cultural challenges.

Challenges and limitations of blockchain in charity: Despite its potential, the adoption of blockchain in charitable activities is not without challenges. First, blockchain technology is still relatively new, and its complexity can hinder widespread adoption, especially among smaller charitable organizations with limited technical capabilities. Second, issues related to privacy and data security, although mitigated by blockchain's design, remain a concern. Third, the regulatory environment around blockchain in Vietnam is still evolving. Although the government is open to blockchain applications, there is a lack of specific legal frameworks that govern its use in the charitable sector (Nguyen, 2020). Lastly, cultural resistance and a lack of digital literacy can further slow down the implementation of blockchain-based solutions for charities in Vietnam.

3. METHODOLOGY

This study uses a mixed-method approach, combining both qualitative and quantitative research methods to examine the application of blockchain for transparency and accuracy in charity activities in Vietnam. This study is exploratory in nature, from which the system is built because blockchain is a relatively new technology in most fields, especially charity in Vietnam, and seeks to provide both theoretical insights and empirical evidence on the potential of this technology.

Qualitative component: The qualitative part of the study will focus on collecting information on projects that have been done in the world, thereby providing development directions for the project in Vietnam. This will provide insights into the challenges and opportunities when implementing blockchain in the charity sector.

Quantitative component: After collecting enough data and development directions of projects in the world, the research team proceeds to build a demo software product system and then evaluate its limitations and benefits.

3.1 Hypothesis Development

Given the reviewed literature, several hypotheses are proposed to guide the study on the application of blockchain for transparency and accuracy in charitable activities in Vietnam:

Hypothesis 1: Blockchain technology improves the transparency of charitable activities in Vietnam.

This hypothesis is based on the argument that blockchain's immutable and decentralized nature can provide real-time and verifiable information about the flow of donations, ensuring that donors and stakeholders can track how and where funds are being utilized (Zheng et al., 2017; Svečnjak et al., 2021).

Hypothesis 2: Blockchain enhances the accuracy of fund allocation in charitable organizations.

Blockchain can reduce human error, fraud, and manipulation by automating processes through smart contracts, ensuring that donations reach the intended beneficiaries without diversion. This hypothesis draws on the findings of Mougayar (2016) and Wright and Filippi (2015) on blockchain's ability to minimize discrepancies in transactions.

Hypothesis 3: The implementation of blockchain will increase donor trust and participation in charitable activities.

Studies (Nguyen & Pham, 2020) have suggested that blockchain's transparency could improve the credibility of charitable organizations. If donors can verify how their funds are being used, it is expected that they will be more likely to continue or increase their contributions.

Hypothesis 4: Technological, regulatory, and cultural barriers hinder the widespread adoption of blockchain in Vietnam's charitable sector.

While blockchain has potential, its implementation is challenged by factors such as technological complexity, lack of clear legal frameworks, and limited digital literacy in Vietnam (Nguyen, 2020)

3.2 Algorithms

The SHA-256 (Secure Hash Algorithm 256-bit) is a cryptographic hash function that produces a fixed-size, nearly unique 256-bit hash value, often referred to as a one-way encryption function. This means it is practically impossible to reverse the process and recover the original data from the hash alone. One of its primary characteristics is the creation of a unique digital fingerprint for any input, such as text or files, ensuring that even the slightest modification to the input will result in a significantly different hash value. This makes SHA-256 highly effective in maintaining data integrity and detecting alterations during transmission or storage. As a one-way function, SHA-256 allows for easy computation of hash values, but due to its design, reversing the process to deduce the original input is infeasible. Furthermore, it is resistant to collisions, making it extremely unlikely that two different inputs will generate the same hash value.

The SHA-256 algorithm uses mathematical functions to perform complex transformations, including the selection function (Ch), the polynomial function (Maj), and the rotation and bit shift functions (RotR and Shr). Specifically, the selection function $Ch(X,Y,Z)=(X\wedge Y)\oplus(\overline{X}\wedge Z)$, and the function $\square(X,Y,Z)=(X\wedge Y)\oplus(X\wedge Z)\oplus(Y\wedge Z)$, is used to decide the values of variables in the calculation steps.

The algorithm uses the functions:

$$Ch(X,Y,Z)=(X\wedge Y)\oplus(\overline{X}\wedge Z),$$

$$\square(X,Y,Z)=(X\wedge Y)\oplus(X\wedge Z)\oplus(Y\wedge Z),$$

$$\sum\nolimits_0(X)=RotR(X,2)\oplus RotR(X,13)\oplus RotR(X,22),$$

$$\sum\nolimits_1(X)=RotR(X,6)\oplus RotR(X,11)\oplus RotR(X,25),$$

$$\sigma_0(X)=RotR(X,7)\oplus RotR(X,18)\oplus ShR(X,3),$$

$$\sigma_1(X)=RotR(X,17)\oplus RotR(X,19)\oplus ShR(X,10),$$

SHA-256 is widely used for various purposes, such as verifying file integrity, hashing passwords, and creating digital signatures. In file verification, it ensures that downloaded files have not been tampered with during transmission. For password storage, instead of saving plain text passwords, systems save their hashed versions, verifying user login by comparing the hash of the entered password with the stored one. Digital signatures created using SHA-256 also help confirm message authenticity and integrity, ensuring that the content remains unchanged.

In Icharity systems, SHA-256 plays a vital role in ensuring the security, transparency, and efficiency of operations. Every transaction on the blockchain is given a unique digital signature through the SHA-256 algorithm, which verifies the transaction's authenticity. Even minor changes to transaction data would result in a different signature, making it easy to identify any tampering. Additionally, the blockchain structure relies on the SHA-256 hash of each block being linked to the previous one, creating a secure chain. Any attempt to alter one block would require modifying all subsequent blocks, a practically impossible task, thereby ensuring the immutability of donation records. SHA-256 also helps protect sensitive information, such as the identity of donors and donation amounts, shielding against theft and tampering of cryptocurrency transactions. The transparency provided by SHA-256 allows anyone to access and verify the transaction history, ensuring that donations are used as intended and building trust among donors.

Proof-of-work (POW) is a consensus algorithm based on proof of work of blocks. This algorithmic principle is based on determining which node will have the right to add a new block to the current chain by providing proof of its work. This consensus mechanism is used in the system network. Confusion in the system occurs when every node broadcast blocks containing the same verified transactions. For example, if a transaction is verified by multiple nodes, the system's storage ledger will have duplicate blocks of different blocks, which unintentionally makes the ledger meaningless because in the blockchain system the blocks refer to each other. with the hash codes of the previous block, so it is impossible for transaction contents to be duplicated in different blocks [Wang et al., "A Survey on Consensus Mechanisms and Mining Strategy Management in Blockchain Networks."]. Because of this, having a mechanism to reach all consensus in the network about the newly created Block is important. PoW will create a puzzle with an adjusted difficulty for nodes in the blockchain network to solve for a chance to add a new block to the current chain. The nodes participating in this puzzle solving process are called miners, and this puzzle solving process is called mining. The miner has the right to select the transactions that are verified to form a block along with information such as the previous hash of the previous block and timestamp. Data and information in the block header will be encrypted by SHA-256 Hash to form the Hash of the block

Proof-of-Work (PoW) offers significant benefits to ICharity systems by enhancing security, transparency, and trust. PoW ensures that each donation is verified by decentralized miners, preventing fraud and ensuring that once recorded, transactions cannot be altered. This creates an immutable, auditable ledger, allowing donors to track their contributions with confidence. PoW also prevents double-spending, ensuring that funds are properly allocated to recipients. By safeguarding the integrity of the system, PoW builds donor confidence and encourages greater participation in charitable activities across the globe.

3.3 Proposed system: Blockchain-based Donation tracking system

Our platform ICHARITY system is used to record charity transactions in a secure, transparent and efficient manner. The system operates on a peer-to-peer basis and uses advanced cryptographic techniques and consensus mechanisms to ensure data integrity.

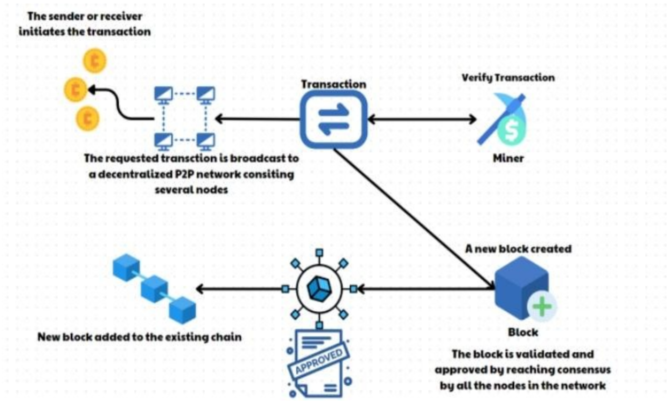

Fig. 1. ICHARITY process

As shown in figure 1, transaction process with a node initiates a transaction in a decentralized blockchain network using a cryptographic digital signature that privatizes the transaction including sender, recipient, transaction amount information. Digital signatures are created using the sender's private key and help verify the validity of the transaction. All the transactions are stored in an unconfirmed transaction pool and propagated in the network by using a flooding protocol known as Gossip protocol, followed by transaction verification and authentication. Nodes in the blockchain network verify the validity of the transaction. The verification process will check the sender's digital signature and the sender's account balance to ensure that they have enough money to make the transaction. The transaction does not end up being double spent, meaning the sender does not use the same amount of money for two different transactions. Double spending refers to using the same input amount for two or more different transactions. Once the transaction is verified and validated by the system, it is included in a block. Nodes in the blockchain network compete to mine a new block. The mining process involves solving a complex problem called Proof of work, the first node to solve the problem creates a new block. This block consists of a group of verified and validated transactions. After mining and block generation the blocks are verified and adding the block to the new blockchain is sent to all nodes in the blockchain network. The nodes verify the block's validity by checking. Once the new block is verified and added to the blockchain, the transactions in the block are considered confirmed. The transaction is confined to have been recorded in the blockchain ledger and cannot be altered or reversed.

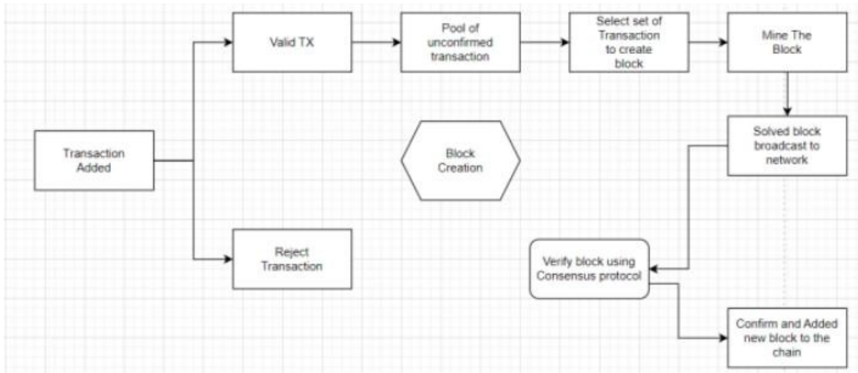

Fig. 2. Block creation process in PoW procedure

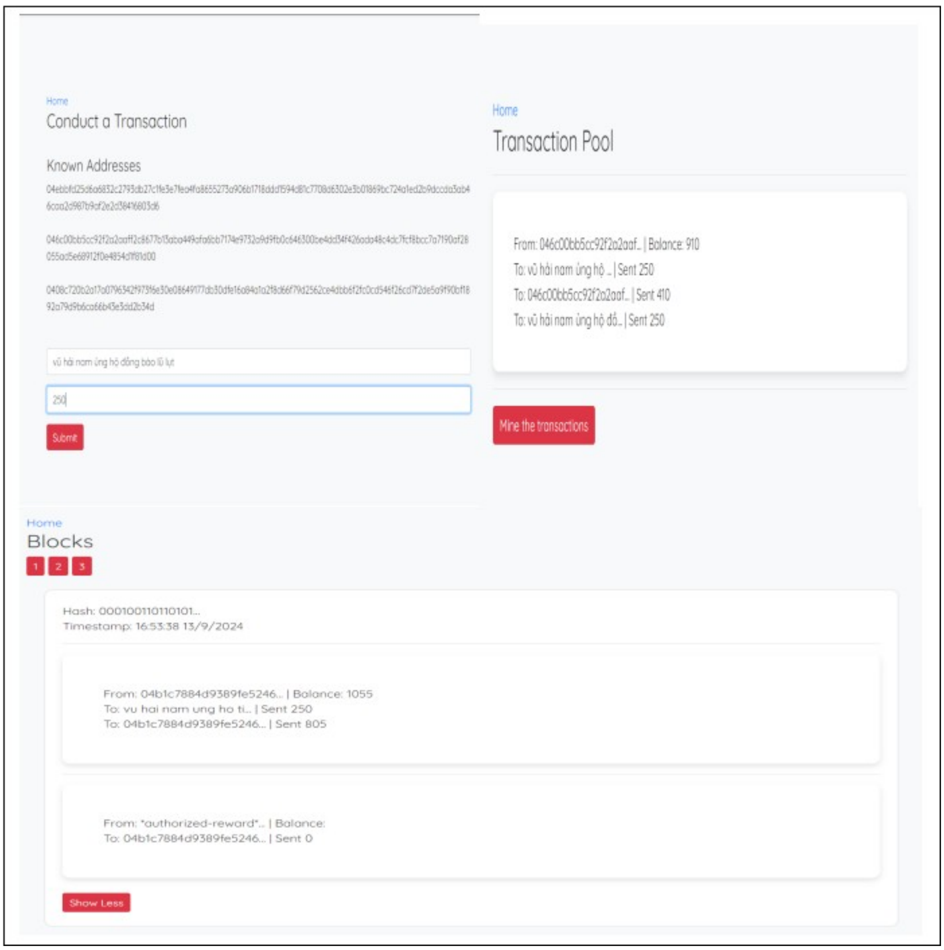

Fig. 3. ICHARITY's charity transaction implementation process

The innovative blockchain-based charity fund system offers a secure and transparent way for donors and beneficiaries to interact. Upon accessing the project website, users are greeted with an intuitive interface displaying encrypted fund names and real-time balances, ensuring both accessibility and privacy. The system's core functionality revolves around its "Blocks" section, where transaction history is meticulously recorded using advanced SHA-256 encryption. Each block contains a unique hash, timestamp, and detailed transaction data, allowing for complete traceability while maintaining the highest standards of data integrity.

As shown in figure 3: To conduct a transaction, users navigate to the dedicated screen where they can view known addresses and input transaction details. After submitting a transaction, it enters the Transaction Pool, awaiting verification through a proof-of-work process. This critical step ensures the validity of each transaction before it's permanently recorded in the blockchain. Once mined, the transaction is added to a new block, and the system automatically updates the charity wallet balance. This comprehensive process not only facilitates secure fund transfers but also provides an immutable record of all activities, revolutionizing the way charitable organizations manage and distribute funds. With its user-friendly interface and robust security measures, this system represents a significant leap forward in bringing transparency and efficiency to the world of charitable giving.

This analysis provides a detailed look at the design elements and functionality of the transaction system in ICHARITY, focusing on its intuitiveness and ease of use. Each step in the process, from transaction initiation to verification, is designed to be clear and transparent, demonstrating an emphasis on building trust among users. Although the system involves complex technical processes such as block mining and transaction management, the user-friendly and minimalistic interface makes it easy for users to operate without requiring in-depth knowledge of blockchain technology. This factor demonstrates the ability to optimize the user experience by reducing technical barriers while ensuring speed and efficiency in processing charity transactions. In this way, the system not only achieves usability but also maintains seamlessness and trust, two important factors in charity-related activities and sensitive financial transactions.

4. RESULTS AND DISCUSSION

4.1. Programming language and environment

The ICHARITY system is developed using JavaScript and Node.js, providing a unified and efficient solution for both frontend and backend operations. The system architecture is divided into four key by Node.js, offering a robust platform for handling asynchronous operations. It incorporates several critical components, including Server Express for managing HTTP requests, routing APIs, and handling middleware such as authentication and logging. The Blockchain Core is responsible for implementing the blockchain structure, managing blocks, handling consensus algorithms like Proof of Work (PoW), and validating new transactions. Additionally, Wallet Management oversees the generation and storage of public-private key pairs, while the Cryptography Module and Database Integration manage encryption algorithms (e.g., SHA-256) and store user information and transaction history securely. A Smart Contract Engine further supports the deployment and execution of Ethereum smart contracts, integrated with Web3.js to interact with the Ethereum blockchain.

```
const bodyParser = require('body-parser');
const express = require('express');
const request = require('request');
const path = require('path');
const Blockchain = require('./blockchain');
const PubSub = require('./app/pubsub');
const TransactionPool = require('./wallet/transaction-pool');
const Wallet = require('./wallet');
const TransactionMiner = require('./app/transaction-miner');

const app = express();
const blockchain = new Blockchain();
const transactionPool = new TransactionPool();
const wallet = new Wallet();
const pubsub = new PubSub({ blockchain, transactionPool, wallet});
const transactionMiner = new TransactionMiner({ blockchain, transactionPool, wallet, pubsub });

const DEFAULT_PORT = 3000;
const ROOT_NODE_ADDRESS = `http://localhost:${DEFAULT_PORT}`;

Tabnine: Edit | Test | Explain | Document | Ask
setTimeout(() => pubsub.broadcastChain(), 1000);

app.use(bodyParser.json());
app.use(express.static(path.join(__dirname, 'client/dist')));

Tabnine: Edit | Test | Explain | Document | Ask
app.get('/api/blocks', (req, res) => {
    res.json(blockchain.chain);
});
```

Fig. 4. System code

On the frontend, the system uses JavaScript to create a dynamic and interactive user interface. The React framework forms the backbone of this interface, enabling the management of the application state and the construction of user-friendly interfaces. Integration with Web3.js allows the frontend to communicate directly with the Ethereum blockchain. Key interface components include dashboards, data entry forms, and transaction history displays. The Authentication Module handles user login, registration, and session management, while the Wallet Interface displays wallet details and supports transactions. Transaction Management enables users to create and monitor the status of transactions, and data visualization features, powered by libraries like D3.js, present charts and statistics for user insight.

The blockchain network is the backbone of the system, consisting of nodes that run full blockchain software, store copies of the blockchain, and participate in the consensus process. Miners validate transactions and create new blocks through the PoW mechanism, while a peer-to-peer network protocol facilitates data synchronization and communication between nodes. Finally, the Security Layer ensures the integrity and safety of the system, employing encryption to protect sensitive data during both transmission and storage, access control mechanisms to manage user rights and enforce security policies, and audit logging to record critical activities for compliance and auditing purposes. Together, these components provide a transparent, secure, and efficient platform for managing charitable donations. Users can track the use of funds, and charities can demonstrate operational transparency, ensuring trust and accountability.

In this performance, we evaluate the system's performance using data collected through the transaction process on our blockchain-based charity system. It is crucial to note that blockchain performance can be influenced by various factors, including network size, smart contract complexity, and node hardware specifications. Our analysis focuses on key metrics such as block mining time, difficulty levels, and average processing times.

The data reveals a system that has reached a significant level of stability can be shown in Figure 5, with difficulty levels ranging narrowly from 59 to 68, indicating network maturity. While individual block mining times show considerable variation (from 26ms to nearly 5 seconds), the system maintains a remarkably stable average processing time of approximately 1.3 seconds. This demonstrates the system's effective self-adjustment capabilities and suggests good potential for handling charity transactions efficiently.

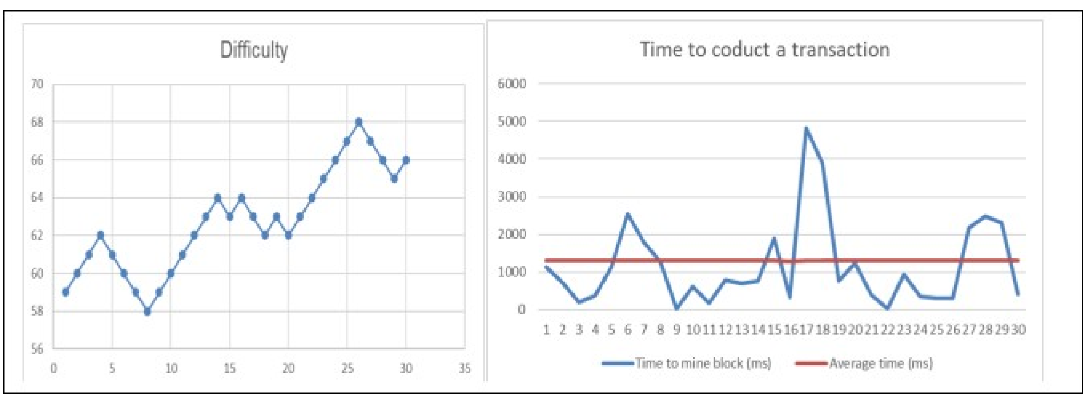

Fig. 5. Test the difficulty and time of transactions

However, the wide fluctuations in individual block mining times highlight areas for potential improvement, particularly in ensuring consistent user experience and mitigating risks of centralization. As we continue to develop and refine this blockchain-based charity system, our focus will be on optimizing the consensus algorithm and difficulty adjustment frequency to enhance overall performance and reliability.

These findings provide valuable insights into the system's current capabilities and areas for future enhancement, particularly in meeting the high standards of trust and speed required in charitable operations.

4.2 Advantages and Limitations

4.2.1 Advantages

Potential application of Blockchain in charity activities: Blockchain is receiving increasing attention in many fields, including charity activities. Previous studies have shown that this technology has the ability to improve transparency and accuracy in charity fund management, which creates a solid theoretical basis for research and implementation of this technology in Vietnam. In addition, the fact that blockchain is not yet widely popular in Vietnam will be an advantage, because the study can provide pioneering findings, helping to promote the application of this technology in the future.

Public interest in transparency in charity: Transparency and accountability in charity activities are issues of particular interest to the public and philanthropists. Therefore, this study is likely to attract attention and support from many sides, including donors, charities and the government. This could also help the study collect more data from donors and charities about the need for greater transparency in charitable activities.

Support from technology experts and blockchain organizations: The blockchain community in Vietnam is growing strongly with many experts, organizations, and related projects. Accessing and cooperating with domestic blockchain experts will help the study have more practical information and easily apply technology solutions suitable for local circumstances.

4.2.2 Limitations

Limitations on facilities: Blockchain has not been widely applied in charities in Vietnam because this is a technology that requires a lot of technological resources.

Accessibility and understanding of blockchain technology: Blockchain is a new and quite complex technology, not all research participants, especially donors and the public, have sufficient knowledge and understanding of how blockchain works. This may affect the accuracy and reliability of the survey results, as some participants may not fully understand the questions related to the technology.

Incomplete legal framework: The legal framework on blockchain in Vietnam is still new and incomplete, making it difficult to deploy blockchain in charity activities. Although the government has support for this new technology, the lack of clear regulations and specific guidelines may reduce the willingness of charities to apply blockchain. This also affects the results of the study, as practical data on blockchain application is limited.

Potential for practical application of the research: Although the research has the potential to contribute positively to the application of blockchain in charity activities in Vietnam, its practical implementation depends on many other factors such as the level of social acceptance, consensus from stakeholders, and financial resources to invest in the technology. Therefore, although the research can provide effective theoretical solutions, their application in practice still faces many challenges.

4.2.3 Future works

Given that the legal framework surrounding blockchain in Vietnam is still evolving, future research should analyze the regulatory environment in greater detail. Studies could focus on how governments and policymakers can create a supportive framework for the adoption of blockchain in the charitable sector. This includes exploring legal issues related to data privacy, smart contracts, and cross-border transactions.

Further investigation is needed into how donor perceptions of transparency and trust are shaped by the adoption of blockchain. Research could explore how donors respond to blockchain-enabled platforms and whether the increased transparency translates to higher levels of engagement and donations. Studies focusing on donor behavior could help tailor blockchain solutions to better meet the needs of both organizations and contributors.

Future research should also focus on identifying strategies to overcome the technological and cultural barriers to blockchain adoption in Vietnam. This includes understanding how charitable organizations can build the necessary technical expertise and infrastructure, as well as promoting digital literacy among both donors and recipients. Exploring educational programs and collaborations with tech companies may be beneficial in driving blockchain adoption forward.

Continue to build and repair to create the most suitable and optimal system for charity activities.

5. CONCLUSION

This study explored the potential of blockchain technology to enhance the transparency and accuracy of charitable giving in Vietnam. Through a comprehensive literature review, the study identified that the decentralized, secure, and immutable nature of blockchain holds significant promise in addressing the challenges of fraud, mismanagement, and lack of accountability commonly found in the charitable sector. By enabling real-time tracking of donations and automated allocation of funds through smart contracts, blockchain can significantly improve trust between donors and charitable organizations. The hypotheses proposed in this study suggest that blockchain can improve the transparency of charitable giving, enhance the accuracy of fund management, and increase donor trust. However, the study also identified several barriers, including technological complexity, lack of digital literacy, and an evolving legal framework in Vietnam. These factors may hinder the widespread adoption of blockchain in the short term. The findings of this study provide a theoretical foundation for further empirical research on this topic. They also highlight the need for Vietnamese charities to consider integrating blockchain technology as a tool to increase transparency in operations and donor trust. The research also completely built a new system using Blockchain technology for charity activities. Although some system parameters have been relatively stable, the system still needs more time to be further improved.

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