

Study on the Integration of Philanthropy and Blockchain Technology

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Abstract

Through the analysis and research of blockchain technology and the operation process of charitable organizations, this study constructs a data structure suitable for charity regulation based on the existing blockchain data structure and statute it according to the characteristics of charity information based on the idea of blockchain, and creates a query mechanism for credible tracking and tracing of data on the chain, so as to promote the openness and transparency of charity regulation in China.

Keywords

Blockchain; Charity; Philanthropy.

1. Introduction

Although China's charity industry started late, it has developed very rapidly, and the number of charitable organisations and the total amount of charitable donations since the reform and opening up of the country have been very significant. The state has been paying more and more attention to charity, gradually incorporating it into social security, hoping that it can share some of the government's functions, especially in the work of helping the poor and contributing to precise poverty alleviation, and thus has made corresponding regulation and integration in legislation and supervision.

In early 2020, China was hit by a new coronavirus-infected pneumonia epidemic, during which the general public and businesses and social organisations at all levels made a large number of charitable donations. This was accompanied by news reports of the interception, embezzlement and resale of donations and materials in the marketplace. The issue of how to regulate charitable donations and materials has been the subject of much research by charitable organisations around the world.

2. Technology and Analysis

Blockchain is a decentralised infrastructure widely used for emerging digital cryptocurrencies, which has received attention and research with the gradual acceptance of Bitcoin. Blockchain technology is decentralised. The outstanding advantage of blockchain technology lies in its decentralised design, which solves the problems of poor reliability, low security, high cost and low efficiency of the current centralised model by using cryptographic algorithms, timestamps, tree structures, consensus mechanisms and reward mechanisms to achieve point-to-point transactions based on decentralised credit in a distributed network where nodes do not need to be trusted.

The essence of a blockchain is a distributed decentralised ledger in which blocks of data are composed chronologically in a chain-table-like fashion and cryptographically guaranteed to be tamper-proof and unforgeable, enabling the secure storage of simple, sequentially related data that can be verified within the system.

The introduction of blockchain's decentralised design into charity regulation is a topic well worth studying. Although a large number of charitable organisations have already realised information management and regular public announcement mechanisms, these mechanisms are all one-way

outputs from charitable organisations to the public, which cannot fundamentally solve the problem of trust. Blockchain technology, on the other hand, can fundamentally solve the problem of public trust in charitable organisations due to its decentralisation and inerrancy.

In China, researchers in many research institutions have realised the importance of blockchain and have applied blockchain technology to various industries, carrying out a lot of effective research work and making a series of progress. The most typical application is the "digital currency" issued by the Central Bank of China, as well as the "smart contract" of the State Grid and the blockchain-based inter-institutional reconciliation platform and discrepancy checking system of major banks, and the cross-border direct link clearing and settlement system transformed by blockchain technology. The system has been transformed by blockchain technology.

Blockchain has also achieved admirable results in recent years in several areas abroad, with a number of successful commercial applications launched. Examples include Amazon's anti-counterfeit traceability application in the US, Spotify's blockchain music copyright trial in Sweden, Canadian bank TD Bank's application to digitally track the movement of assets using the public blockchain, and many more.

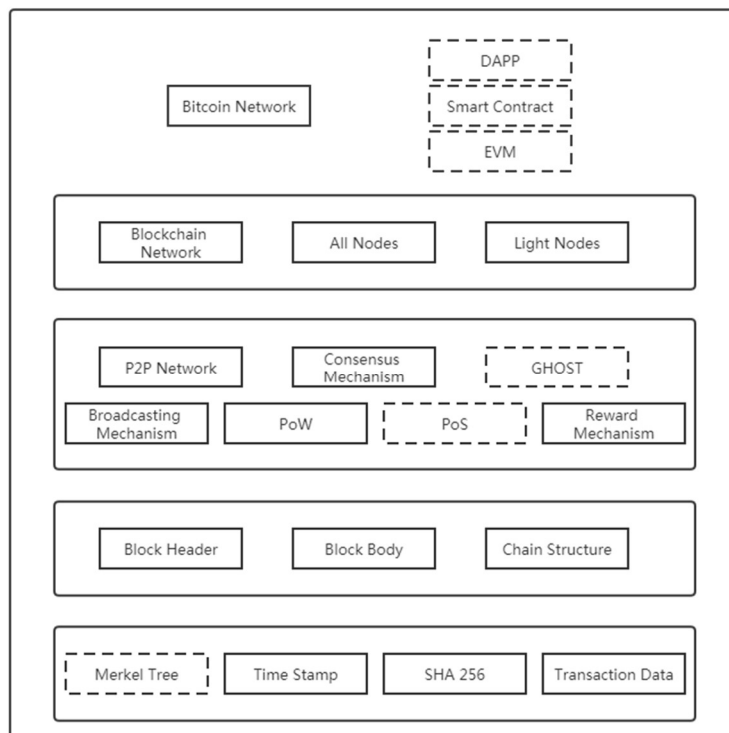


Figure 1. Blockchain infrastructure

The infrastructures of Bitcoin and Ether are shown in Figure 1. The dashed lines in the diagram indicate the differences between Ether and Bitcoin. In general, a blockchain system for digital currencies contains several elements: the underlying transaction data, a narrowly defined distributed ledger, an important consensus mechanism, a complete and reliable distributed network, and a distributed application on top of the network. The underlying data is organised into blocks as a data structure, the blocks are linked in chronological order into a blockchain, each node in the fully distributed network keeps a distributed ledger called a blockchain, the network communicates using P2P protocols, consensus mechanisms are agreed upon, and various relatively advanced applications are generated based on these foundations. The tamper-evident data structure of the blockchain, the

consensus mechanism of the distributed network, the proof-of-work mechanism and the increasingly flexible smart contracts are representative innovations in this architecture.

3. Content of the Study

Firstly, the operation process of charitable organisations should be sorted out, and the information that can be put on the chain should be statutorily defined; secondly, under the analysis of the existing blockchain architecture, research should be conducted to build a blockchain data structure suitable for charitable supervision; thirdly, research should be conducted to build a query mechanism for credible tracking and traceability of data on the chain.

We need to focus on the process of chaining each donation data and the use of this donation. Various charity information has different requirements on the design of data structure, so building a suitable blockchain data structure for charity regulation is the issue we need to focus on.

One of the more difficult issues is how to select the right charity information and to standardise it. As charity information is mostly sensitive data, how to select effective and sufficient information from a large amount of data will be a major challenge. After the data has been standardised and uploaded onto the chain, how to express it on the chain and how to allow users to use the existing information for traceability is also a major challenge.

As an emerging technology for decentralised, non-tamperable data, blockchain is even considered the 5th disruptive computing paradigm after mainframe computers, personal computers, the Internet and mobile social, and the 4th milestone in the history of human credit evolution after blood relatives' credit, precious metals' credit and central bank notes' credit.

4. Conclusion

The use of cutting-edge blockchain technology to conduct in-depth research on the regulation of philanthropy in China has important research implications and application value. It is believed that with the introduction of blockchain technology, it will greatly facilitate people's understanding of charity information, support voluntary activities and charitable giving, while at the same time regulating the charity industry, thereby increasing public confidence, obtaining financial support, ensuring that charities represent the public interest and ultimately promoting the development of charity in China.

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