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Blockchain Technology Distributed Organization Management Structure of Incentive Model

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Abstract. To fundamentally solve the "prisoner's dilemma" of the incentive system, we propose an incentive model built from the existing blockchain ecology. It uses blockchain as the underlying technology, federal learning as the operational basis, a decentralized autonomous organization as the organizational form, smart contract as the means of implementation, and non-homogeneous pass-through as the incentive mechanism, and the core method is to use zero-knowledge proof in privacy computing to build a trustworthy and reliable management decision to achieve "power and responsibility matching" more efficiently.

Keywords: Digital Art, NFT, Blockchain, Music Digital Collection, Art Market

1. Introduction

The transparency and reliability of blockchain technology can establish common operating standards and collaboration for business owners, managers and other stakeholders, minimizing trust costs and transaction costs to achieve a zero marginal cost society. "The essence of blockchain is that you don't need to trust anyone." Blockchain is an epoch-making technology based on smart contracts that realize "no need to trust people" (McAfee & Brynjolfsson, 2012). When trust becomes the air and water of society, the organizational structure and management mode of enterprises will surely face a new great change since the equity system.

With blockchain as the underlying technology, DAO (decentralized autonomous organization) as the organizational form, federated learning generated by distributed collaboration network as the basis for decision making, and an incentive mechanism based on non-homogenized pass-through NFT (Non-Fungible Token) to implement decision making and execution in the form of smart contracts, its efficient execution and fast market response will help enhance the core competitiveness of enterprises. This incentive model provides unlimited possibilities for the realization of autonomous organizations. The main goal of DAO here as a novel organizational structure is to go beyond traditional forms of organization by enabling decentralized decision-making processes that are distributed, transparent, and minimally dependent on trust. This allows independent verification of the organization's operations and promotes the pursuit of common goals through consensus-based mechanisms.

Several techniques have been available for solving the problems of over-centralized decision-making, opaque decisions, and poor policy implementation in traditional enterprises. For example, zero-knowledge proofs and federated learning methods in privacy computing build secure channels for data circulation under privacy protection and help to solve the data asymmetry problem (Kramer & Tyler, 1996). The application of blockchain technology can make existing management processes more trustworthy, transparent, and verifiable, and support experimentation with ownership structures and democratic forms of governance for scarce resources such as data in a non-commutative NFT incentive manner, helping to address the trust asymmetry problem (Takabi, Joshi, & Ahn, 2010). By solving the two problems of "data asymmetry" and "trust asymmetry", the organizational structure of the enterprise can be improved. The integration of blockchain technology, DAO organizational forms, distributed collaboration networks fostering federal learning, and the adoption of NFT-based incentive mechanisms present significant opportunities for enterprises to enhance their core competitiveness. By leveraging smart contracts for decision-making and execution, organizations can achieve efficient operations and rapid market responsiveness. This incentive model opens up boundless possibilities for the realization of autonomous organizations. This paper discusses the basic framework of the incentive model, the core components, the implementation model, and the specific process of generating management decisions under the basic framework and implementation model.

1.1. Introduction of DAO

The primary objective of a Decentralized Autonomous Organization (DAO) is to transcend conventional organizational structures by facilitating collective decision-making processes that are distributed, transparent, and characterized by minimized reliance on trust. In essence, a DAO represents a novel organizational architecture that enables independent verification of operational procedures and promotes the pursuit of shared objectives through consensus-driven mechanisms.

One distinct feature of DAOs lies in their utilization of blockchain-based smart contracts, which encode and enforce decision-making protocols and ownership assignments. The advent of smart contracts has paved the way for transformative advancements, as they ensure complete transparency of governance rules within the DAO while safeguarding against tampering by any member or external entity. This is achieved through the public auditability and decentralized security provided by the blockchain network and the execution of code within smart contracts.

1.2. Introduction of NFT

Non-Fungible Tokens (NFTs) are distinct digital tokens that exist on the blockchain, representing unique entities such as digital artifacts, exclusive in-game items, rare collectible trading cards, or other exceptional digital/physical assets. NFTs signify a recent advancement in blockchain-based assets, surpassing the realm of cryptocurrencies, stablecoins, governance tokens, and utility tokens. They introduce users to a novel form of digital asset that incorporates an innovative ownership and distribution model.

2. Literature Review

2.1. The basic architecture of blockchain technology

The basic architecture of blockchain technology is shown in Figure 1, which mainly includes six important elements: data layer, network layer, consensus layer, incentive layer, contract layer, and application layer, and its essence is a distributed database built on a P2P network.

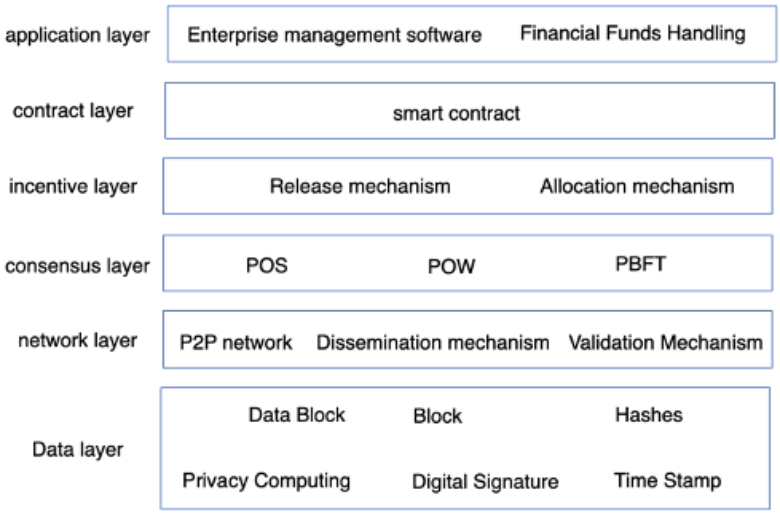

Fig 1: Blockchain Infrastructure Technology Architecture

2.2. Blockchain organizational structure route

With blockchain as the underlying technology, the decentralized peer-to-peer network architecture is built to achieve open and transparent information and process of enterprise decision-making under the premise of ensuring a secure network.

In the form of DAO, the incentive model adopts a distributed ownership structure, which makes the participating members become the decision makers and owners of the organization (Hong et al., 2021). This distributed and autonomous group wisdom decision-making approach can break the bottleneck of the traditional organization management based on the individual wisdom of the integrated decision-making model, thus making the decision reliable.

With a smart contract as the means of implementation, the incentive model writes the rules of organizational management into the code and is deployed on the blockchain, which can operate autonomously and automatically according to the established rules without the intervention of the third party, thus promoting the transformation of organizational management into a standardized self-operating mode (De Filippi & Hassan, 2021). It helps to solve the trust asymmetry and timeliness asymmetry faced by organization management.

With NFT as the incentive mechanism, the incentive model encourages more members to actively participate in managing projects that can generate higher NFT rewards for them through the allocation, acquisition and circulation of NFT based on reputation, quality and contribution and leads members to creatively serve organizational management goals instead of passively with a more precise and personalized incentive, so that the decisions generated by DAO on the blockchain are truly usable

organizational management decisions. With this incentive attribute, NFT can therefore be used as a reward for certain specific tasks in organizational management, helping companies to enrich their marketing tools; at the same time, it is good for employees to generate intrinsic motivation in certain specific parts, effectively achieving attitude and behavior change, and largely stimulating their activeness and stickiness.

2.3. Incentive Composition of Distributed Organization Structure

2.3.1 Blockchain as the underlying technology

Blockchain is the underlying technology to realize distributed organizational structure. Based on the distributed multi-party mutual trust and other features of blockchain (Wang et al., 2019) it realizes the immutability of record information and breaks the centralized management of the traditional organizational pyramid. In the blockchain-based management system, node trustworthiness is ensured through the establishment of an authorization mechanism, result reliability is ensured through the design of a consensus algorithm (McMillan, 2008) and process security is ensured through the use of encryption technology. With the increase of blockchain bookkeeping nodes and the expansion of market scope, the marginal cost of blockchain transactions will be decreasing, and a large number of market organizations will exist in the form of decentralized autonomous organizations at the intersection of organization cost and transaction cost curves. The decentralized autonomous organization with blockchain as the underlying technology, as a new organizational form, has completely changed the form of traditional organizational management in the past and has the core attributes of decentralization, autonomy and flatness, and openness.

content	public chain	Alliance chain	private chain
Organization Manager	No	yes/multi-party enterprise	yes/independent
BCN Participant	unspecified majority/permission less	specific plural/Permissioned	within the organization/Permissioned
Consensus mechanism reached	pow(proof of work)/pos(proof of stake)	Consensus/Voluntary Join and Strict Approval Before Specific Persons	In-organization/voluntary participation and strict approval
model	Bitcoin, Ethereum and other digital currencies	Self-developed model	

Fig 2: Blockchain classification and features

2.3.2 Operating based on federal learning

The management within the organization is caused by the information closure and closed-loop effect of each department, resulting in the independence of data, which leads to the inability to adapt and failure in the face of the expansion of the market scale and the upgrading of the staff structure (Ouyang et al., 2019). The network circulation of data on the chain is realized through federal learning, which forms the support of the incentive model in the management decision-making process. In this process, data storage, privacy calculation, and value embodiment are the unification of these three. The node state data needs to be stored locally after collection, while the internal data circulation will be screened for data uplinking. In this case, the situation is better compared to the uncertainty of the value and the inability to confirm the right of the data owner before the chain. After that node data and transaction data can be verified at any time and their legitimacy is ensured in the transaction (Pich, Loch, & De Meyer, 2002). Zero-knowledge proof in privacy computing is equivalent to security imputation,

simulation, knowledge and knowledge extraction, which enables us to verify quickly given the proof/evidence, and anyone can verify it quickly when given the evidence x for this assertion (Vergne, 2020). Based on running with federal learning, distributed computing, data nodes, and models all have an impact on the results.

2.3.3 NFT as an incentive model

The incentive model of NFT is the core, the attribute of NFT for enterprise organization management system is a kind of economic incentive because it can't be combined with the profit brought by the outside system, it needs to be combined with the annual benefit of the enterprise, employee performance, contribution and other non-beneficial incentives on behalf of the internal organization, to build a new incentive model with uniqueness and irreplaceability, so that the organization managers and workers to generate mutual profitability for both parties (Crosby, Pattanayak, Verma, & Kalyanaraman, 2016). The economic model with NFT as the core is a non-homogeneous incentive model, employees and workers expect to receive NFT to be able to trade in a specific range of markets in exchange for corresponding compensation, so it is significantly different from the traditional income, in different business areas, different management contribution to the organization, the premise of the traditional income model cannot cope with (Li, Yuan, & Wang, 2021). On this basis, the employee performance model and contribution model are important reference bases. The data nodes obtained with blockchain as the underlying technology are authorized to be added to the employee performance model, and the evaluation is determined by participating in the whole process of organizational management decisions, and the data nodes with higher participation are considered more credible in the blockchain network (Swan, 2013), and the performance points obtained will also be recognized by the whole network, and each participant in organizational management decisions will be more easily verified and passed. When the performance model is not associated with the degree of participation or decision, some "harmful nodes" may appear in the network, which is very unfavorable in the long-term organizational management system. Therefore, for the contribution model, the difficulty of the task should be evaluated and calculated first, and then the smart contract should be written after the management has fully understood the profitability and executability of the task.

2.3.4 Smart Contracts as a Means of Implementation

Smart contracts are mainly based on the decentralization of the inability to tamper and other characteristics, through the deployment of the written code on the chain to automatically execute, the process is impossible to interfere with or interrupt the human. This mechanism makes the trustworthiness of the blockchain much higher and also gains the trust of both the organization manager and the management. In the organizational management structure through technical means to achieve automated contract terms and conditions of fulfillment, greatly reducing the behind-the-scenes non-public transactions, solving the crisis of trust and efficient decision-making in transactions and other issues. In this process, contract generation, contract verification, and contract maintenance are the basis to ensure the effective implementation of this tool (Qin et al., 2021). First of all, contract generation is a process of converting high-level language into machine language, generating contract rules that meet the requirements through different application scenarios and transaction terms in the organizational structure, formulating communication rules for network-wide notification or partial notification and execution methods (Alkhammash, Beloff, & White, 2020), and finally generating and uploading to the chain. Among them, the terms related to the organization management are the basic guarantee of operation, and the decision-making terms of the organization management are the cornerstone to ensure the operation in the contract system constraints.

3. Results and Discussion

The incentive model of distributed organizational structure based on blockchain technology is to realize the automatic execution of management decisions deployed on the chain, and then the d ecision results are applied to the chain, and the implementation of the entire organizational management structure is completed through the trusted data generated by the mutual trust mechanism on and off the chain (Chod, Trichakis, & Yang, 2022). The loops and iterations generated by this mechanism not only guarantee the continuity and efficiency of organizational management but also reduce the problem of inefficiency and process lag caused by the over-centralized authority of organizational management like the previous pyramid.

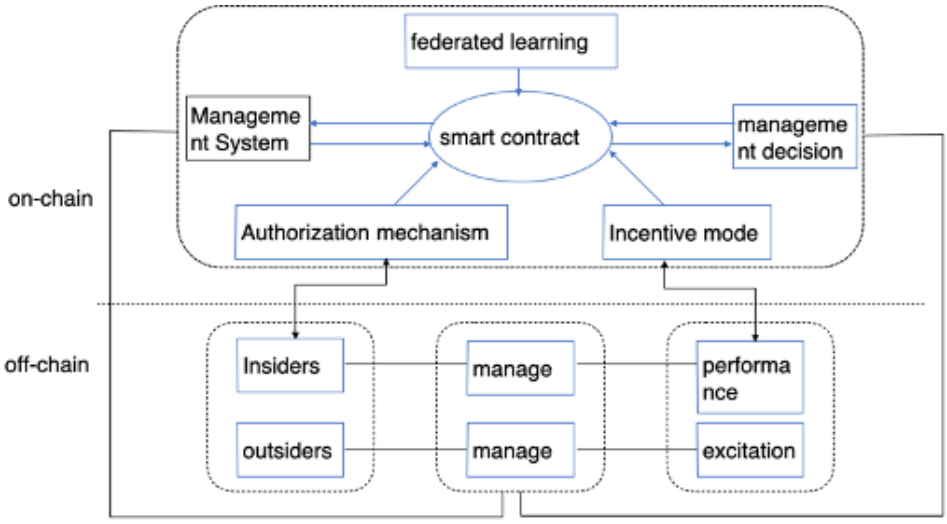

Fig 3: Implementation of the incentive model

The smart contract on the chain is the core, playing the role of data interaction for the management system and management decision, driving each node to actively participate in the organization management process from three dimensions of federal learning (Ouyang et al., 2021), authorization mechanism and incentive mode, giving full play to the group collaboration mode of smart contract, enriching the organization management system and decision through the collected data, effectively making up for the low credibility and high decision cost in the architecture caused by the problems of information asymmetry and data asymmetry in the traditional model of organization management.

Under the chain is a process of supervising and managing the management mechanism and performance incentive from both internal and external aspects. The decision-makers of the company need to stream the data with the authorization mechanism and incentive model in the chain to form an effective management system to adapt the implementation plan of the model under the chain. Meanwhile, there are two types of personnel under the chain, internal personnel has the right to vote, are authorized and join the DAO, and participate in the development and decision-making of the organization's management system. External personnel are those who do not have the right to vote, are not authorized, and do not join the DAO. It can be seen that the relationship between on-chain and off-chain is not isolated, but interdependent. Under this incentive model, a trustworthy state loop is formed by making full use of federal learning, privacy computing technology and smart contracts, and a decision model is created by fusing the data obtained on-chain and off-chain, which effectively reduces the risk of organizational management and improves the decision making and scientificity of organizational management (Yuan & Wang, 2017). The management system that is decided by the internal personnel under the chain will be stored on the chain in a distributed manner and added to the smart contract for automatic execution. Through this operation, the data requested by the insiders under the chain interacts with the federal data learning and is transformed into the incentive model on the

chain. The data flows freely on and off the chain under the authorization mechanism, providing a fully reliable and trustworthy database for the distributed organizational management system and decision-making system.

Distributed organizational management structure incentive model is developed and run based on the coalition chain, DAO is certainly around a discursive and credible standard, in the case of voluntary membership to the new organizational management system, smart contracts on the blockchain must go through a series of steps before deployment, proposal, approval, voting, authorization and verification. Unlike the traditional organizational management structure, the consensus mechanism is generated in DAO, and the voting mechanism is jointly used to complete the process. The choice of voting mechanism is crucial, and there are various forms of voting mechanisms, including one-person-one-vote mechanisms, representative system, flow democracy voting system, etc. Among them, one-person-one-vote is more used in traditional elections because it is simpler, and currently, proof of human DAO adopts this approach. The proxy system is a system that authorizes the exercise of voting rights by proxy, and the EOS chain uses this voting mechanism. Streaming democratic voting system has a higher degree of freedom and enhances the participation of voting. Currently, the governor DAO provided by the compound uses this voting method.

4. Conclusions

The traditional motivation model is to manage the behavior and methods of employees, especially managers want to know more about what employees are doing and where the task is going (Wang, 2004). Then a series of evaluation criteria are used to test and appraise, and suc h appraisals often have fixed criteria and steps, and the appraisal is to give feedback on whether the goals initially set are accomplished. The traditional incentive model is entirely passive, with an emphasis on evaluation and assessment. The non-homogeneous NFT incentive model encourages employees to complete the initial performance goals set by the management, and the emphasis is on "autonomy", including the behavior of employees, the participation of the management system, which includes the participation of smart contracts, this incentive model not only emphasizes the results of assessment and incentive but also enhances the incentive organization This incentive model not only emphasizes the result of assessment and incentive but also enhances the source of motivation for the development of the structure.

the incentive model of a distributed organizational structure based on blockchain technology provides a compelling framework for efficient decision-making and the establishment of transparent and trustworthy management systems. By leveraging smart contracts, data interaction, federal learning, authorization mechanisms, and incentive modes, the model enables active participation and collaboration among stakeholders, driving the organization towards common goals.

The core aspect of this incentive model is the utilization of smart contracts on the blockchain, which facilitates data interaction and serves as the backbone of the organizational management system. Through the collection and analysis of data, the model effectively addresses the challenges of information asymmetry and data asymmetry inherent in traditional management structures. By promoting transparency, trust, and verifiability, decision-making processes are enhanced, leading to more reliable outcomes.

Furthermore, the off-chain component of the model plays a critical role in supervising and managing the organizational management mechanism and performance incentives. Internal personnel, who possess voting rights and are authorized members of the DAO, actively contribute to the development and decision-making processes. External personnel, although lacking voting rights and DAO membership, are essential for providing external perspectives and insights. The interplay between on-chain and off-chain interactions creates a dynamic and collaborative environment that strengthens the overall management system.

Based on blockchain ecology, the most critical of distributed organizational structure is non-homogeneous NFT, without the support of uniqueness and non-comparability characteristics, it also

loses the source motivation of economic incentive (Andoni et al., 2019), which is unfavorable to the development, operation and improvement of building organizational management structure. Therefore, this paper explores the basic framework, core components, implementation model of incentive model and the specific process of generating management decisions under the basic framework and implementation model, and through the mutual trust of on-chain and off-chain data, the reward system based on NFT characteristics, and the use of privacy computing zero-knowledge proof to achieve organizational management decisions under consensus under the premise of safety and security, it is concluded that the non-qualitative NFT incentive model in the new organizational management architecture It plays a very good role and is the key to achieve successful changes in enterprise organizational structure and management model.

The incentive model is built upon a federated chain, with DAO operating based on discursive and credible standards. The deployment of smart contracts follows a well-defined process, involving proposal, approval, voting, authorization, and verification. Various voting mechanisms, such as one-person-one-vote, representative systems, and streaming democracy voting systems, can be employed based on the specific requirements and characteristics of the organization. Each mechanism offers unique advantages and levels of participation, ensuring fairness and inclusivity in decision-making processes.

In conclusion, the distributed organizational management structure incentive model, supported by blockchain technology and DAO, offers a promising avenue for enhancing decision-making efficiency and establishing transparent and trustworthy management systems. By harnessing the power of decentralized technologies, organizations can incentivize active participation, promote collaboration, and overcome the limitations of traditional management structures. Future research should focus on further refining and optimizing the incentive model, tailoring it to different organizational contexts, and exploring its potential applications across diverse industries.

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