Non-Fungible Governance for the Management of Token Projects

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Abstract

Decentralized governance is playing an increasing part in the cryptocurrency technology sphere, evolving from the necessity to distinguish tokens/coins separately from the securities issued for companies or other legal entities in control of the token/coin projects. Governance for most projects is handled via a one-to-one mapping of voting rights to the number of tokens or coins held. This paper proposes alternative mechanisms for applying Non-Fungible Tokens (NFTs) to project governance structures, referred to as Non-Fungible Governance, allowing for the establishment of new and complex levels of control for token projects.

Fungible Governance presents risks of adding oligarchal control to token projects, and the use of Non-Fungible Governance allows a potential means to mitigate these risks. Mitigation can be utilised through the selective restriction of transfer of rights, the restriction on weighting applied to fungible tokens held in parallel, and the expiration of rights as the token project matures.

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Introduction

The capstone of cryptocurrency infrastructure, coins, and tokens is the implementation of decentralization. In practice, no cryptocurrency can exist without an individual or group of individuals catalysing the system's initial existence, but the centralized control over the token is typically surrendered to token holders themselves. This surrendering of control yields new incentive structures for the token itself and its long-term operations, as those holding the token can influence its governance, growth, and management for their collective benefit.

Decentralized control, or governance, of a token is relatively common with newly established token projects. With traditional corporate governance structures for companies, each shareholder retains some level of control over and regulation for the company they are issued for. These governance attributes are replicated within token governance systems, allowing projects to shift control to token holders instead of primarily with their legal entity.

The standard approach to defining token governance is simply by declaration that each individual fungible token is equal to all other tokens defined within the protocol. The greater the holder's balance of fungible tokens, the greater their overall voting weight. This flat governance structure may not provide the level of nuance required for newer and more complex projects, and for this reason the present paper proposes alternative mechanisms for applying Non-Fungible Tokens (NFTs) to project governance structures, which we will refer to as Non-Fungible Governance, allowing for the establishment of new and complex levels of control for token projects.

The ERC-721[1] standard defines the use of NFTs on the Ethereum blockchain; however, this technology is not limited to use on the Ethereum blockchain. This standard is simply used as an example of the application of Non-Fungible Governance for projects as it defines the additional functionality of transferral, which will be discussed later in this paper.

Decentralized Governance

Rights Issuance

NFTs typically hold two key attributes - one is that they are uniquely identified (the nature of non-fungibility), and that they provide some information that dictates their value. This information can be encoded directly onto the blockchain for immediate reference, but to remain within the constraints of the block size, the information is usually encoded as a reference to an off-chain repository.

A common application of NFTs is to encode references to off-chain repositories of artwork or media, allowing individuals to create and exchange media within dedicated marketplaces. A less

[1] https://eips.ethereum.org/EIPS/eip-721

common use of NFTs is the issuance of *rights*. NFTs can be defined to be bound to a particular schema, defining the qualities of the right itself. These rights can include attributes of the token bearer (such as country of citizenship, with the right representing a proof of verification of that citizenship), or the right itself to gain access to a system (such as administrative privileges).

For Non-Fungible Governance, these issued rights can represent particular classifications within a project's or organization's structure. Typically, with the issuance of shares for a regulated company each shareholder retains a particular class of shares that dictates the level of function within the governance of the company. Whereas with Non-Fungible Governance, that same classification structure can be translated to a token project itself.

Each NFT issued for token governance is intended to represent a hierarchical position in the project, incentivising the growth of the token project by issuing governance NFTs of greater governance value to early project adopters (in effect those that bear the highest risk), but still retaining decentralization of the token governance. These rights still rely on the total quantity of fungible tokens owned by the holder, so that the overall stake of their rights scales with their holdings.

Consideration should be given to the risks of fungible token accumulation by NFT holders, and limits should be utilised to prevent, for example, a token holder with greater rights accumulating a large quantity of fungible tokens to exert excessive control over the token project.

Governance Transferral

NFTs can, optionally, include the transferable attribute. This attribute permits the transfer of ownership of the NFT to another token holder, and is typically unrestricted (predetermined allow or deny lists would be difficult to define for an immutable contract).

It is at the discretion of the token creator to define their transferral rights, however consideration should be given to the risks of accumulation of greater rights. Should an individual address trade/accumulate additional rights from other NFT holders, then limits (similar to limits of fungible token weight) would be imposed to protect the token project from centralization.

Expiration of Rights

As token projects increase circulating supply via secondary markets, the risks of centralization against the token's governance structure is diminished. To accommodate the change in governance risk, it is necessary to restrict additional governance rights through temporal constraints. For example, the greatest governance rights may be awarded to the project team, but then expire upon the project reaching a percentage of the token supply entering circulation.

At the instantiation of a token the expiration structure should be defined, and bound to milestones related to its market depth. This may introduce additional risk that rights may be

diminished prematurely, or overdue, if the milestones are not met or delayed. It may be prudent to include the decision of terminating additional governance rights in the form of a vote to token holders, but care should be taken to ensure the current rights holders cannot perpetually vote against these modifications.

Identity Binding

In conjunction with the issuance of NFTs to addresses, the addresses of those NFT bearers can also be registered within identity management contracts on the chain. This provides additional tools for management through the enforcement that:

- all elevated rights are required to be registered identities,
- revoked identities can trigger the revocation of governance tokens, and
- services can be constructed to monitor and validate the identities of all governance holders.

Additional services can add a level of assurance to projects that elevated rights holders have been identified prior to the establishment of token projects (for example, requiring registration of all governance holders before the token is deployed to production networks). Whilst coordination of cartel activity is still possible, the additional complexity layer will provide greater assurance-in-depth for projects and deter individuals from collectively coordinating an attack to gain voting dominance.

Conclusion

In a sense, the creation of tokens built upon smart contract technology is pushing further into a replication of existing systems beyond merely financial services, and governance is an indirect replica of essential corporate governance structures. Fungible Governance presents risks of adding oligarchal control to token projects, and the use of Non-Fungible Governance allows a potential means to mitigate these risks. Mitigation can be utilised through the restriction or non-restriction of transfer of rights, the restriction on weighting applied to fungible tokens held in parallel, and the expiration of rights as the token project matures.

These mechanisms for Non-Fungible Governance are not unique or complex solutions, they are simply the extension of existing governance systems into the realm of blockchain technology, leveraging the non-fungibility of newer token technologies. They are, however, necessary to transition more complex systems on to blockchain and smart contract technology.

About

This whitepaper was developed by Congruent Labs Pty Ltd, an Australian software development company registered since 2017.