

# The Co:Create Protocol: A Primitive for Fostering NFT Application Ecosystems

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## 1 Introduction

Non-fungible tokens are a powerful web3 primitive; they enable something to be, at the same time, digital and unique. This carries a broad set of implications, including, at base, the ability for creators to access global markets and benefit from the resale of their work.

However, NFT projects thus far have faced a number of limitations, notably:

- The absence of an express governance token often means decisions are made centrally, without the participation of the project community.
- The absence of a token economic model makes it difficult to incentivize a diverse set of contributors to the project. Effectively, the only participants incentivized to contribute are the initial creators, and to some degree buyers and marketplaces. This impacts ongoing project evolution and sustainability.
- The benefits of the success of the ecosystem accrue centrally to the projects and a small group of buyers, rather than to the broader community of participants and contributors who have bootstrapped the network effects of the projects.
- The tight coupling between smart contracts and client interfaces (e.g. marketplaces, games, other decentralized applications) orients network effects around a single client, decreasing variety and innovation around clients<sup>1</sup>.

Ultimately, this has meant that while NFT projects have several benefits of web3 (e.g. access to global markets, encoded royalty structures), other web3 benefits are missing (decentralized value creation and capture, which leads to exponential project innovation). Furthermore, NFT projects currently have many of the drawbacks of web2 (e.g. centralized control, highly concentrated economic benefits).

What would be more powerful is if NFTs natively had a mechanism where (a) participants are incentivized to contribute because those who bring value to the project benefit in accordance with the value they bring, (b) multiple independent clients exist with access to the same listings, allowing interface innovation and serving different niches, (c) the underlying smart contracts and clients are open source and composable with other applications, (d) a broad swath of participants are involved in governance.

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<sup>1</sup> Client is a piece of software that interacts with the NFTs on behalf of the owner.

We propose a mechanism that makes this possible, that we call Protocol-Controlled NFTs. The core of this mechanism is to have a protocol that controls the minting and future royalty streams of NFTs, with a token economic model that accrues demand for limited supply of the fungible token if the NFTs become popular, all governed by a DAO whose members are those with the token. Such a mechanism allows communities to form organically around NFT projects, and for these communities in turn to create vibrant ecosystems around those projects – ecosystems including, for example, alternative marketplaces, games, events that require NFTs for access, etc.

We describe this mechanism in the context of a reference protocol that we call the Create Protocol. We later describe how several instances of the Create Protocol (for several different NFT communities) can be combined to form what we call the Co:Create Protocol, allowing each NFT community to benefit from not only the success of their community, but also the success of other communities.

## 2 The Create Protocol

### 2.1 The Base Protocol

The Create Protocol has five components: the NFT minting mechanism, a royalty management mechanism, a native utility and governance token, a DAO, and a treasury.

An NFT project would instantiate a Create Protocol instance prior to or following the launch of NFT collections. At instantiation, the project would determine their Create Protocol parameter settings, including voting and quorum thresholds for DAO governance proposals, token allocations to initial contributors and the DAO treasury (including any airdrops), and royalty rates and splits on future NFT collections. The royalty rates for resales would default to 10%, and the royalty split for both the initial sale and resales would be distributed among the NFT creator, NFT collection holders, and the DAO’s treasury<sup>2</sup>.

### 2.2 Protocol-Directed Minting

Once the Create Instance is launched, any DAO member may propose minting an NFT drop to the DAO by staking a certain amount of token. The DAO then votes on whether that NFT drop should get minted by the protocol. Members of the DAO use staked tokens to vote. If the vote doesn’t pass, then the proposer loses their stake. If it does pass, the proposer earns a fee, denominated in the native token, taken from block rewards.

Once the vote passes, the NFT drop is minted, and the protocol auctions off the NFTs. All proceeds from the initial auction and resales are sent to the protocol royalty manager, which swaps the proceeds for the native token on a

<sup>2</sup> Upon launching their Create Protocol instance, the project team would be prompted to redirect future royalties from previously minted NFTs to the protocol royalty manager, if applicable.

DEX, and then sends the native token to the creator, collection holder pool and the DAO's treasury, according to the royalty split. The proceeds sent to the collection holders are locked for a certain time period.

This mechanism ensures three things:

- First, from a governance perspective, that tokens are distributed to those who participate in the bootstrapping of the network – the creators and collectors.
- Second, that NFT sales result in demand for the token. The NFT success therefore breeds the success of the token, and in doing so provides projects with a powerful means to incentivize contributors and other creators to add value to the community (e.g. through token grant programs and block reward distributions).
- Third, that for highly aspirational NFT projects where demand for NFTs greatly exceeds supply, a broader and more diverse group can become part of the community.

### 2.3 Protocol-Directed Purchases

So far, the protocol allows for minting NFTs through the protocol. While this handles a number of use cases, it may also be useful to enable purchasing NFTs through the protocol. We do so in the following manner.

Block rewards, denominated in the native token, accrue to the treasury according to a regular schedule. The DAO may use the treasury to purchase existing NFTs, rather than minting them through the protocol. A voting threshold for purchasing would be set, similar to the voting threshold for minting, and a proposer would propose a purchase (or sale) in the same manner that they would propose a mint, by staking a certain amount of token and putting the proposal up for a vote.

## 3 Use Cases

### 3.1 Collective Governance and Incentives around an NFT Collection

Most NFT collections currently have no collective governance mechanisms. In many ways, they don't need them – applications (for example games using the NFTs) can be introduced permissionlessly. However, this is limiting – one can imagine a number of scenarios in which collective governance is useful. The issuance of new NFTs in the collection, for example, has impact on the broader community. Too few new drops would lead to too exclusive a community to be meaningful except as a status symbol. Too many new drops would lead to inflation. Similarly, the licensing of the brand and imagery of the collection for things like t-shirts or video games should ideally be a community decision.

Similarly, NFT collections have no native incentive mechanisms for ecosystem creation. If somebody creates a game that requires players to own an NFT from

a collection in order to level up, it would benefit the NFT holders but not the game developer. To create a vibrant ecosystem, it is useful to have incentive mechanisms by which developers would benefit from making games that require the collection's NFTs.

Both of these issues can be addressed through instantiating the Create Protocol with a high voting threshold for minting (ensuring that the only NFTs minted through the protocol are authentic), and a 50%/25%/25% royalty split between the creator/nft collectors/DAO treasury. This gives NFT creators and NFT collectors a large governance say. Licensing decisions can be made by the community with licensing proceeds contributed to the DAO treasury. DAO treasury funds can be used to incentivize the development of games and other clients that benefit the ecosystem. These token grants to third parties can be a function of app utilization by NFT collection holders. This would result in those games and applications that provide the most utility to NFT collectors, receiving larger token grants funded by the DAO.

### 3.2 Creating a Community around a Marketplace

Let's imagine there is a decentralized version of a marketplace like OpenSea that would like to share the benefit of its success with the contributors who were responsible for that success, the creators and purchasers on the platform.

The marketplace can implement the Create Protocol with a zero-vote threshold for minting, a 97.5%/1.0%/1.5% royalty split between the creator, nft collectors, and DAO treasury.

A marketplace like OpenSea that is already in existence could choose to airdrop tokens to creators and purchasers who have already participated in the network, in accordance with how early they participated and the extent to which they participated, retroactively rewarding those who helped build the network and giving them a say in governance.

### 3.3 Influencer Networks

Let's say you have an NFT marketplace that creates and markets collectibles for influencers. Here, one can deploy an instance of the Create Protocol with a medium voting threshold for minting (to ensure that the influencers deploying NFTs to the network are high quality), and a 70%/5%/25% split between the creator/nft collectors/DAO treasury, recognizing in this instance that (a) the platform will play an outsized role in bringing influencers onto the platform and building their collectibles (as compared to a less curated marketplace like OpenSea), so the DAO take should be high, and (b) the influencers will be more influential in bootstrapping the network than the collectors.

One can imagine having the voting threshold for minting change linearly over time, so that at the beginning, there is a high threshold for what NFTs get minted, and over time, it becomes more like an OpenSea.

### 3.4 Interspecies DAOs

Let's imagine a group that has purchased a forest, and wants to sell the forest while enforcing certain rights of the forest itself – for example, the right to remain free from human tampering. We can imagine doing so by minting an NFT for each acre of the forest through the protocol, where the NFT represents ownership of that acre. Let's also presume that we can recognize deforestation in that acre through satellite imagery and machine learning.

In this case, the voting threshold could be set high for minting (to ensure that the forest NFTs are legitimate), and the royalty fee could be set in a variable, sensor-dependent manner. If there is no history of deforestation since minting, resales of the forest could go 97% to the seller and 1% to the DAO treasury and NFT collectors. If there is a deforestation event, all resales would go 100% to the DAO and 0% to the seller<sup>3</sup>.

Such a mechanism creates a strong disincentive for deforestation, while allowing forest owners to still benefit from stewardship of the forest through earning ecological service credits (for example, on-chain carbon credits).

### 3.5 Crowdfunding a Single NFT and Cooperative Museums

So far, none of the use cases that we have explored have used the Protocol-Directed Purchase feature. The simplest use of this feature would be to enable a group purchase of a single NFT. Let's imagine that 1,000 people wanted to get together to buy an NFT representing an acre of forest (or a Bored Ape). In this case, an instance of the Create Protocol could be instantiated wherein protocol-directed purchases are enabled. The voting threshold could be set high, and the royalty split could be set to be 100% to the DAO. The collective would purchase tokens in a presale (or on the open market presuming another way to bootstrap liquidity for the token), and then would use the tokens in the treasury to purchase the NFT.

It's straightforward to imagine this mechanism being extended to multiple NFTs, forming a cooperatively-governed museum or art gallery.

## 4 Additional Considerations

### 4.1 Variable Staking

For high-volume instances, one challenge will be the attention of the DAO to different minting proposals. We can address this in part as follows. The protocol would set a default staking amount required to propose an NFT mint. However, proposers may choose to stake more than that. The higher the staked amount, the higher up on the voting queue the proposal goes. This allows proposers who have high confidence that their NFT mint will pass to receive expedited voting.

<sup>3</sup> Another way to implement this would be to have a deforestation event trigger an automatic transfer of the NFT to the DAO.

## 4.2 Continuous Threshold Voting

In the base example, the protocol would set both a quorum threshold and a voting threshold for NFT votes. For example, an instance may set that at least 30% of token holders need to vote, and of those, 90% need to vote yes in order for a mint to pass. One can collapse these into a single threshold variable as follows: one can calculate the odds of the yes/no breakdown at the end of the voting time period, presuming a 50% prior probability of each token voting yes, divide that by the probability of a 50/50 vote given the same number of voters. In other words, if  $s$  is the score,  $y$  is the number of yes votes,  $n$  is the number of no votes, and  $t$  is the total number of votes, then:

$$s = \frac{(t!/y!n!)/2^t}{(t!/(.5t)!(.5t!))/2^t} = \frac{(.5t!)^2}{y!n!}$$

Intuitively,  $s$  will give you a sense of how unlikely it is for the final vote to have been the result of random chance. The lower  $s$  (presuming  $y > n$ ), the more strongly the community is expressing their preferences to mint. A benefit of this score is that it makes it possible to compare a scenario in which 50 people vote yes and 10 people vote no, with a scenario in which 600 people vote yes and 300 people vote no, eliminating the need for setting quorum thresholds.

## 4.3 A Judicial Review Model for DAO Moderation

In addition to voting mechanisms, a DAO should be able to set forth ground rules for NFTs they mint. For example, DAOs are likely to want to prohibit the minting of NFTs that violate somebody's copyright or trademark rights, or that contain illicit content. One can see these ground rules as a constitution; in the same way that voters may not vote in a way that violates the constitution, DAO voters may not vote in a way that violates these ground rules.

This analogy suggests the following moderation mechanism, based on the concept of judicial review. Anybody may flag a proposal as potentially violating the ground rules. If an NFT is flagged,  $n$  members of the DAO judiciary are notified at random, and those  $n$  need to vote on whether the NFT does indeed violate the ground rules. Each of those members must stake some native token in order to vote. If their vote matches the consensus vote, they earn a reward from block rewards. If their vote does not match consensus, or if they abstain or do not vote in time, their stake gets slashed.

Members of the DAO judiciary can be selected in any one of three ways. They may be appointed by the initiators of the DAO. They may be elected by the DAO. Or any member of the DAO could choose to be a member of the judiciary. (The analogies here are: appointed judges, elected judges, and juries). An instance of the protocol would choose one of these methods at the time of instantiation.

## 5 The Co:Create Protocol

### 5.1 The CoCreate Factory Method

Because each instance of the Create Protocol is the same set of smart contracts except with different parameters, one can set up a factory method to create new instances of the Create Protocol. This is similar in spirit to Uniswap's factory method that sets up new liquidity pools. This factory method defines the Co:Create Protocol.

This has two benefits. First, the smart contracts for each instance of the Create Protocol do not need to be written from scratch and maintained independently. Rather, they are written once and generated for each new instance.

Second, it can provide a mechanism by which NFT communities can not only contribute to (and benefit from) their own success, but also to the success of other NFT communities. We describe how this works in the CO token economics section.

The native token of the protocol, CO, operates similarly to the UNI token. It gives governance rights to the Co:Create Protocol and governance rights to management of the Co:Create treasury.

### 5.2 CO token economics

CO is a governance token, and holders of the CO token vote on core protocol features (such as parameter settings) as well as how to spend the treasury. From a good governance perspective, one wants to distribute governance of the Co:Create Protocol to those who contribute most to the protocol, in other words, those who set up successful instances of the Create Protocol (weighted by how early they set up their instance).

We do this by introducing a hub-and-spoke exchange. Each instance, rather than retaining 100% of the tokens they receive, retains most of the tokens, and sends a small amount to the Co:Create treasury. In exchange, the Co:Create treasury will grant the Create instance treasury CO tokens, equivalent in value to the token exchanged, minus a small protocol fee. With this mechanic, the more active instances get more governance voice on the Co:Create Protocol, and the Co:Create Protocol is able to bootstrap a diversified treasury.

Just one more thing is needed: to find a way to recognize that early instances have more impact on bootstrapping the Co:Create network than later instances. The protocol does this by adjusting the protocol fee charged in the swap over time. The earliest instances therefore get slightly more CO tokens for the same amount of total activity, giving them more governance power in the network<sup>4</sup>.

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<sup>4</sup> It is even possible to have the fee be negative initially, creating an incentive rather than a fee at the beginning of the network.

## 6 Conclusion

We have defined a new pattern that uses a token economic model to bootstrap application ecosystems, incentive mechanisms, and governance paradigms around NFT communities. This pattern is applicable to a wide variety of use cases, from NFT marketplaces to cooperative museums.

We also introduce a factory method, that creates new instances of this pattern. Spiritually, this is similar to Uniswap, which introduced a new pattern around constant factor liquidity pools, and then created a factory method to create new instances of that pattern.

NFTs have been useful as ways to own digital art, as ways to create community, as new modalities for identity, and as ways to maintain digital ownership of real assets like forest. We believe that adding the functionality associated with fungible tokens – as a means of payment for utilities, as an incentive mechanism to reward participants, and as a way to distribute governance to community – will be useful for NFT communities that currently do not have these mechanisms. The Co:Create Protocol provides a flexible way by which to do so.