

Content Collectives

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Abstract

Publishing technologies have long been the choke point of many creative industries. With new internet technologies, we can now create communities centered around media where creators are appropriately rewarded for their efforts. This paper introduces Content Collectives, a new type of Decentralized Autonomous Organization (DAO) for creator communities.

In contrast to traditional platforms where value primarily accrues to a private network that hosts the content, Collectives are owned and governed by their contributing members, ensuring that contributors are equitably rewarded for their work.

Collectives present a solution for maintaining a public commons in an Internet that is quickly becoming dominated by content aggregation companies instead of the creators that make them possible. In this paper, we address some of the technical and social challenges and offer insights to create more equitable decentralized communities. For simple tools to help you get started, check out Kooi Network's [Content Collective template](#).

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Overview

Artists and creators have been working together in communities for a long time. Rhodian sculpture workshops are one early example—groups of often unrelated sculptors producing work together in Greece, dating back to 340 BCE.¹ Similar groups have thrived in science and invention. The term “thought collective,” coined in 1935 by physician Ludwig Fleck, described a community of researchers working together to push the bounds of existing knowledge through a shared framework of customs and study.²

Content Collectives are the next step in the evolution of personal ownership within a community aspiring to a united goal.

A *Content Collective* is a type of Decentralized Autonomous Organization (DAO). The Collective is a [decentralized](#) group of creators and the media they produce, controlled by a [DAO Governance Protocol](#). Owned and governed by its contributing members, the Collective ensures that contributors are equitably rewarded for their work. The Collective commissions, creates, and/or curates content, then uses that content to earn tokens (KOL for attention, revenue from ads, etc). Depending on the rules of the particular DAO protocol, ownership and revenue are distributed to members of the Content Collective.

What is a DAO?

A Decentralized Autonomous Organization (DAO) provides governance and fiduciary rights to its members without the necessity of any executive or oversight personnel. This structure has major advantages for organizations that want to exist beyond the life of their individual members. A Content Collective is a form of DAO designed specifically for curating information, including media assets or other creative output. Collectives may present a solution for maintaining a public commons as the Internet has become dominated by content aggregation companies instead of the creators that make them possible.

What is decentralized media?

Decentralized media is a single digital asset stored on many devices. One form of decentralized networks that has quickly gained traction are the dynamic storage networks used by organizations like Arweave, Filecoin, or Swarm, where the underlying content is stored across hundreds or even thousands of user devices around the world. Some benefits of decentralized media include: censorship resistance (one centralized actor cannot remove the content because it is distributed across many jurisdictions), global participation, and transparent interactions with the media.

¹ Goodlett, V. C. (1991). Rhodian Sculpture Workshops. *American Journal of Archaeology*, 95(4), 669–681. <https://doi.org/10.2307/505898>

² Sady, Wojciech (2016). Zalta, Edward N. (ed.). *The Stanford Encyclopedia of Philosophy* (Summer 2016 ed.). Metaphysics Research Lab, Stanford University.

What are Governance Tokens and why are they useful?

When a Collective makes decisions, it must have an internal structure for tracking the rights and obligations of internal parties. Governance Tokens currently serve this role in most DAOs and decentralized networks, typically following the pioneering models of Ethereum and Bitcoin. In cases where decisions cannot be made in an entirely trustless fashion, tokens can be staked as collateral to support extended operations and human moderators.

Tokens and the governance tools that are being built around them aim to create space for governance methods beyond plutocracies. These tools will allow organizations to have truly global, decentralized, and democratic governance where each voice is heard, and give space for better representative democracies. Through verified decentralized identities, tokens can be delegated to the actor who holds the views most similar to a given token holder.

How can communities store their memories forever and pay hosting costs organically?

In contrast to Governance Tokens, which cannot be used as currency, communities will also need to pay to store and host their content. Different communities will pursue different strategies to accomplish this. Communities are defined by inclusion, both in the speech and forums of the group and the rights that come with that inclusion. In most cases, communities develop internal practices, each of which can serve to provide funding for their expansion and growth. As an example, consider a newspaper or online blog where advertisement or a subscription model may be offered to support a common goal of the organization, or be sold to cover distribution costs or pay more writers.

As the community earns income (for example, KOII tokens through the attention given to the content, or from sales) they can upgrade the storage of each piece from temporary, centralized server storage to permanent, decentralized storage. The Collective can select works individually, based on the attention or income a piece generates, or upgrade all works, using the rewards from the most attention-getting pieces to fund the storage fees for the whole collection. Through this earn-to-store model, the Collective doesn't have to pay the fees upfront, allowing more space for creators or work that is less certain to be profitable.

Applications

There are many potential applications for Content Collectives with a wide range of scale. A few are mentioned below, but application is only limited by the bounds of our collective creativity.

Macro

On a large scale, we can envision a new generation of social media, publicly available and free-to-contribute platforms but without handing over the rights of your work to a centralized actor.

Specific use cases could also include documenting historical commemoration of meaningful public events, like the inauguration of a world leader or a geopolitical conflict. Similarly, a Content Collective can also be formed around community memory archives like the [Girl Scouts of America](#) or cataloging the experiences of a geographical area in turmoil (e.g. ensuring historical and cultural archives survive a natural disaster or war).

Content Collectives are also an obvious application for art. A Collective can easily facilitate large scale, global, communal art projects where voices are valued based on the Collective's governance and impact rather than location, time zone or other logistical factors.

In the world of decentralized contribution, we can imagine new patent systems where a qualified group determines the validity of a patent publicly. Or a scientific peer review process, which can allow other scientists or analysts to see the methods by which an article is reviewed, should the results ever be called into question. These processes value transparency, participation and censorship-resistance more highly.

Micro

Then there will be some smaller or more personal projects springing out from Content Collectives. Groups surrounding a fun theme like cute cats or memes have already emerged on platforms like Reddit. Global games like scavenger hunt adventures or the next *Pokémon Go* with teammates are also possible, and can be enabled through wordpress-like templates that make it easy for creators to take advantage of the new technology.

Small group events or celebrations for commemorating, organizing, or voting within a Collective are also possible, and can benefit smaller communities as well as larger ones. A few examples include: having all your friends add the photos they took at your wedding or a birthday party, recording minutes and casting votes at the next Homeowners' Association meeting, fundraising for a high school baseball team or passing verifiable information about your home renovations from one home owner to the next. Furthermore, existing web3 companies like [Metablox](#) already use similar systems to store historical information about physical locations and communities. These are all situations where a Content Collective can be applied, whether the goal is to increase transparency, create a single place where everyone contributes their content, or ensure equal and fair voting.

How Content Collectives Work

Content Collectives have the potential to reform the way we view media as part of society. By creating open and transparent structures of ownership and enabling anyone to join, we will provide a framework for an internet of people and ideas rather than advertising and propaganda.

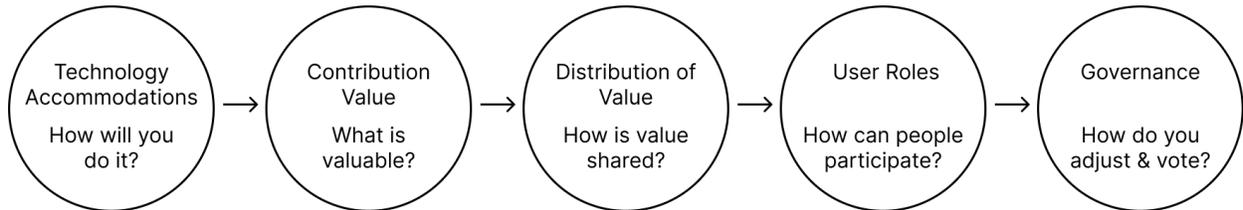


Figure 1: Initial decision-making flow for Content Collectives.

We propose five key parameters that a Content Collective needs to define:

1. **Technology Accommodations**
How does it store, retrieve and track data, especially media? How do members interact with the Collective and each other?
2. **Contribution Value**
What matters to the Collective? How are contributions defined and measured?
3. **Distribution of Value**
How does the Collective distribute value?
4. **User Roles**
How can someone participate? What are their privileges and responsibilities?
5. **Governance**
How are new decisions made? How does the Collective update the current structure and above parameters?

Technology Accommodations

In order for a product like this to work, it is essential that the storage costs of the content do not dwarf potential revenue. Ideally, a solution would support a wider group of users who may not already have the necessary underlying cryptocurrency required to pay upload fees.

The most viable path towards such a system might use [Koji Tasks](#) to handle the different stages of the upload process. As content receives more attention or generates revenue from another source, we can safely make the archive of that content progressively more permanent ([see below](#)).

User Experience

Because blockchains run on cryptographic keys and not usernames and passwords, it can be difficult to build convenient features like login resets. As a result, we at Koi have developed a set of tools, collectively referred to as [Koi-X](#), which are designed to make it easy and appealing to use cryptographic toolkits and Software Development Kits. This includes templates for different types of applications, so anyone can create communities suited to their needs and will make it easy for others to join and participate.

Using the Correct Storage Option

As an example of how Progressive Permanence³ might work, consider four storage options that exist already in the Web3 ecosystem. Depending on the application, a Collective might prefer for all content to only be stored temporarily—as would be necessary for a decentralized Snapchat-like app—or for longer time periods via Arweave, Filecoin, or another alternative (e.g. a community’s Facebook page or a local artisan group’s portfolio website and Shopify store).

Storage Network	Storage Term	Cost	Speed
IPFS	Live nodes only	Free	Slow, but faster when dCDNs are used
Filecoin	Short-term	Low (~0.1 / GB / year)	Fast
Arweave	Infinite	Moderate (~\$5 / GB)	Fast
Traditional Layer 1s (i.e. ETH)	Infinite	Very High (> \$1,000 / MB)	Fast

**Storage fees vary widely based on token price and network traffic.*

In cases where users shouldn’t be charged up front, we can allow their files to be stored temporarily on their devices and other nodes via IPFS before being archived more permanently.

³ Progressive Permanence is the process by which decentralized content is stored in more permanent places over time, depending on how much engagement it receives. In this example, we show IPFS as the initial storage place, where media is only hosted as long as it is pinned by the owner (very low permanence). As content gets more views and interactions, it earns attention rewards and can afford to pay its own storage fees on a somewhat more permanent system like Filecoin. Only after it earns a certain amount of attention rewards—when it can effectively pay for its own permanent storage, or by some other metric dictated by the Collective—does it get stored in a truly permanent archive.

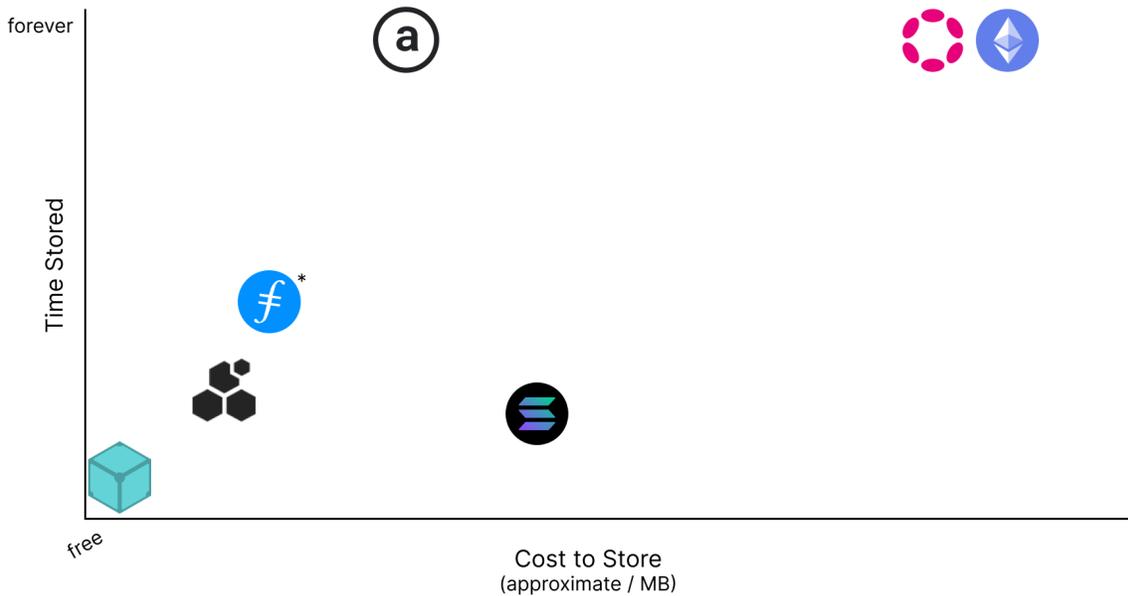


Figure 2: Graph depicting different storage solutions approximate cost versus time stored.
 *Filecoin has several options which include higher costs for more time stored.

Generating Unique Content IDs

Most content networks use a transaction-based identifier, which doesn't support assets that move from one storage location to another over time. A transaction-based identifier uses an action like minting, for example, to represent the file associated with that action. In order to support content that can be bridged across ecosystems, we need a different identifying methodology.

Current Solutions

There are two main options, neither of which is entirely satisfactory.

Content Fingerprint Model*



Leader-Chain Registry Model

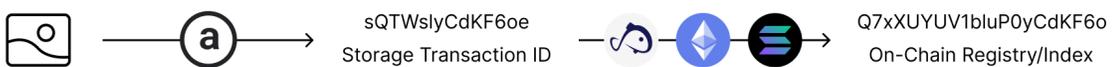


Figure 3: Methodology of the two current solutions for creating unique content IDs.
 *The Content Fingerprint Model does not support indexing.

1. Unique Fingerprinting

It is possible to generate a unique ID called a hash, which is different for every file. When a hash is written to a blockchain, it serves as an easy way to authenticate downloaded files. This method is useful since the ID can be generated from the media itself, instead of stored elsewhere. However, it presents limitations where multiple versions or sizes of a file are used, since these cannot be directly connected to each other and will have different hashes. Additionally, files do not contain any metadata implicitly, therefore it is not possible to track ownership within this model and a secondary system is still required.

2. Leader-Chain IDs

One alternative to hash-based IDs is to create another registry location, and use a specific ID from that system. This approach is often implemented when using networks like Solana or Ethereum already, where the media assets cannot be stored on the primary blockchain. This produces some follow-on issues, however, since the registration of the content then becomes dependent on the Leader Chain.

Possible Alternatives

One potential option for Content Collectives is to create a new content indexing model by introducing collaboration between community members to maintain a common list of 'included' assets. The storage of these assets can be allowed to migrate between a range of systems as long as the community can maintain a continuous custody and location reference. Under this model, the registry itself is not fixed to any one blockchain either, which makes bridging and other features compatible by default, instead of as added features.

Collectives and other organizations need a system that allows any content stored in a decentralized way (i.e. Atomic Assets) to exist *and be identified* independently of the chain that it lives on at any given moment. The system also needs to provide contextual data to speed up registry lookups and prevent copyright infringement or license violations. This concept is explored more in our earlier work on [Atomic NFTs](#) and the [nature of their use as web content](#). What we've proposed above are a few possibilities to solve this need, but surely more will develop as Content Collectives and their membership grow.

Valuing Contributions

Members of a Collective may contribute in order to earn a larger stake in the organization. In order for this process to be successful and transparent, there must be a common standard for evaluating the contributions of each member, which can scale their voting power and rewards proportionately.

Contribution value can be calculated as the total of revenue being added to the Collective from the content submitted. In a rudimentary implementation, this includes Attention Rewards, advertising revenue (if applicable) and appraised price of the asset at sale, along with any other revenue streams which may be more specific to the particular application or use case (e.g. royalties or physical items).

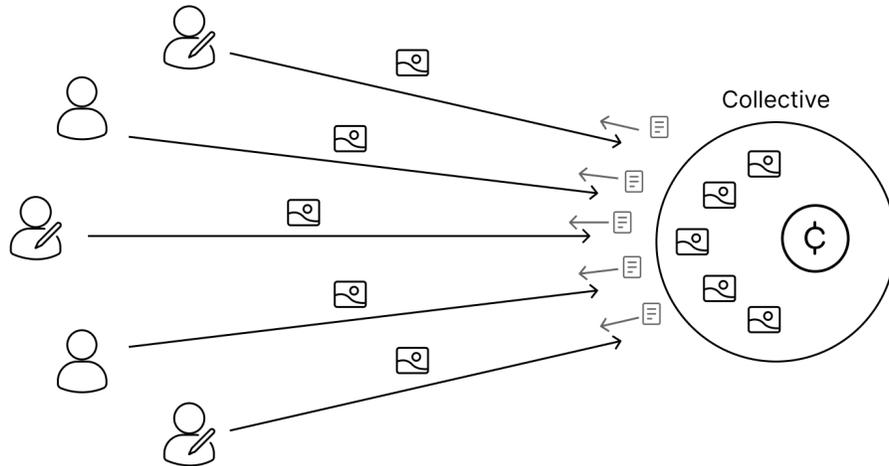


Figure 5: Creators contribute work to the Collective and receive [receipts](#) in return.

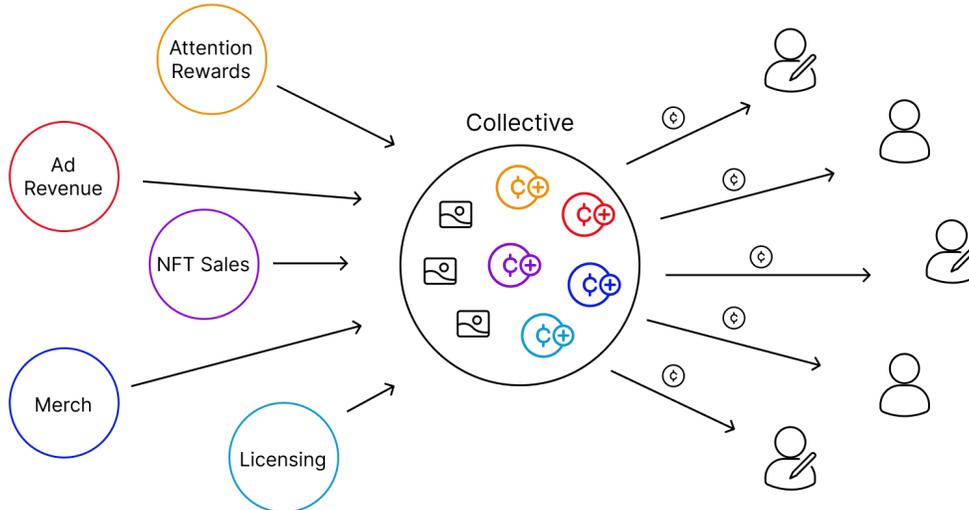


Figure 6: Once the Collective earns value from different revenue streams, it rewards the creators based on their contributed value.

There are some other ways to reward value contributed to the Collective. Below are a couple examples of rewards mechanisms from existing DAOs, shared here as initial possibilities and food for thought.

1. [ENS DAO](#) distributed the \$ENS token based on participation in the ENS ecosystem.
2. [UniSwap](#) distributed the \$UNI token to people who had traded with or contributed liquidity to their product.

In each case, the team (friends, organization, or loose group of acquaintances on a mission) who founded the DAO decided how to measure the value that people contributed, and allocated tokens accordingly. Content Collectives will make similar decisions. What do they value? How much is that worth? Who decides? How will value be distributed, how much will be given, and to

whom? Some decisions will have to be made at a Collective's inception, but as a decentralized, community-governed body, these "rules" will be crafted and adapted to the will of the group over time.

Distributing Rewards

Governance

In exchange for contributing to the Collective, a creator will receive an NFT that functions as a 'receipt.' If that creator contributes multiple pieces from the same wallet, those receipt tokens will be bundled into a single token containing their receipts from each contribution (technically, an NFT that contains other NFTs).

These receipts do not have to be transferable if it is desirable to keep governance of the Collective controlled by those who participate and avoid being overtaken by an outside actor. Receipts can be redeemed when the contributor wishes to remove their contribution from the Collective, unless part of the Collective's purpose is to sell work outside of the group. Withdrawal can be handled on an individual basis and will, in most cases, lessen the contributor's voting power. Rewards can be shared by individual contributors of that piece and the Collective at a percentage governed by the specific incentives designed by each Collective.

There are several different voting models that can be implemented that each have their own upsides and inherent risks. [Vitalik Buterin](#) describes several options in a [post on his website](#). Again, as with all other aspects of Collectives, we anticipate a thriving ecosystem of new ideas for distributing rewards will blossom with the accessible technology.

Monetary Rewards

In addition to exchanging governance receipts for contributions, each Collective will decide on its own method for rewarding creators. There are many different ways to do this and different tokens that creators could earn. One simple way to distribute rewards is modeled after traditional art galleries or music royalties: the creator and the Collective treasury each earn a predetermined proportion of all rewards. There are many 'payment' models and each Collective will need to decide which model suits their needs best.

These rewards can be paid in whatever token the Collective finds most desirable and most efficient. KOII tokens received from attention rewards are a simple way to reward everyone involved, but a Collective can also create their own token to distribute to members if they have the necessary resources and incentive mechanisms. In this scenario, the Collective will earn KOII then pay out their proprietary token to the members. Certain non-proprietary tokens may be more desirable to a Collective's membership, so consider your audience when deciding how your Collective will reward its members in more than just governance. If work is being sold on a platform in one currency, considering the factors of swapping for a different token (exchange fees, etc.). It would also be possible to reward members with multiple currencies, depending on the situation.

Commissioned Works

Artists have for centuries depended on *patrons*, notably wealthy individuals or organizations who support the artist through commissions. At least as early as the Italian Renaissance, private citizens have funded great artwork, and have played a major role in supporting the arts community. This is an important dynamic, and will likely always play a role, but now, there is also a way for a public group to make such an investment, based on the desires of its members.

Within Collectives, it is not unreasonable to imagine that there can also be a desire to incorporate specific artists or to request specific works. In these cases, not only can the Collective invest in growing their community, but they can also immediately begin to build revenue streams from that content without removing it from the public sphere.

User Roles

The user roles laid out here are a basic introduction to the possibilities. In the initial stages, these are the simplest roles, clearly defined by permissions. The two simplest roles listed below are Community Member and Contributor, since communities usually need both to thrive, but each collective will likely want to modify these roles or add more to suit the specific needs of their community. A Contributor can act as a Community Member, viewing content and adding to the community with attention.

Roles can evolve as well. Just like in any social platform with user roles, active and engaged community members are often elevated to a Moderator role (or similar) once they have shown sufficient interest and dedication to the project. It is worth noting that combining subjective and objective role advancement is tricky and rife for corruption, especially when that advancement is tied to voting power. If a Collective chooses to have a mid-tier role, it is best to create objective criteria to achieve that position.

Role	Permissions	Benefits	Notes
Community Member	<ul style="list-style-type: none">- Can view any content- Create Proofs of Real Traffic- Value of attention	<ul style="list-style-type: none">- Anyone can read content	Can view content, credit artists, but can't vote
Contributor	<ul style="list-style-type: none">- Add content- Vote on new rules and any verdicts	<ul style="list-style-type: none">- Scaling voting power to contribution value	Contributors often inhabit the role of Community Member
Moderator	<ul style="list-style-type: none">- Flag NSFW- Mute users- Admin needs		

As Content Collectives become more popular, groups will have more specific ideas about how members of their communities will engage with the content and the options can grow. As Collectives define more robust roles, we (the Collective co-writing this paper) will add further documentation to demonstrate multiple possibilities for Collectives to grow and self-govern. We are looking forward to the new and creative ideas that future Collectives invent.

Governance

While the structure laid out in this document is intended to provide a basis for these kinds of systems, it's essential that contributors and any other voting member are able to vote to refine these rules as necessary, and to add new ones if desired.

Types of votes might include:

- Admission of new content to the Collective
- Verifying that contributors are real people
- Updating to a new smart contract (new set of rules)
- Changing the storage structure (e.g. migrate from Filecoin to Arweave)
- Withdrawing or converting funds from a core wallet
- Changing or adding roles within the Collective

This list demonstrates a few suggestions but is not comprehensive. Depending on the Collective, there may be many other changes that require a vote.

The Collective must configure the voting standards, which include social requirements (necessary qualifications to propose a vote) and the technical requirements (methods by which the change is proposed and voted on by members). There are many DAO toolkits that assist with proposing and casting votes, and you can even access some of these features from Koi Network's [desktop node](#).

Adoption

Building Community

As we've seen from the growth of Profile Picture (PFP) collections over the past year, there are a range of significant incentives that can be used to grow a community around a token incentive, including community perks, permissioned communications, and events.

Additional Incentives & Privileges

As has already been the case with existing artist collectives, NFT “clubs” and generally any social group with sufficiently interested members, it is not hard to imagine that membership in any one community will come with significant privileges and rewards. In 2021 alone, owning a [Bored Ape Yacht Club NFT \(BAYC\)](#) could get you in to see The Strokes and Chris Rock. Then in March 2022, millions of ApeCoin ([\\$APE](#)) were dropped to BAYC holders, who now use them to transact with one another, buy merchandise, and more.

There are a few methodologies for Collectives or DAOs that revolve around or are interested in content. One option is to, like BAYC, start with the media and then create events, merchandise, etc. around membership in the group—whether that's holding an NFT or some other mechanism for joining the Collective.

A second option is to start with tokens, then create content and access to that content by holding the tokens. In this scenario, tokens act like your membership card to the gym. One example is the [LIT DAO](#), which, if you held enough, gave you access to the [first NFT by Robert De Niro](#).

The third process is the opposite: start with content and then add tokens, whether they are freely given to the community or sold as part of the ecosystem. This is similar to what BAYC did with the \$APE airdrop in 2022, but without the cultural events and sweatshirts in between. A good example of this is [Cool Cats](#). They created an NFT collection, then launched [\\$MILK](#) as a social token to use within their ecosystem, where any holder will automatically earn tokens and can use them to evolve their cats.

The methods mentioned above are the simplest form of privileges given to people who join a Collective. However, we expect that people will create a wide variety of reward mechanisms beyond the ones we've already seen and continue to innovate for the members of their community.

Marketplace Integrations

In the event that content from the Collective needs or is designed to be sold, the Collective can either retain profits, or distribute them to the creators. In the event that a creator wishes to withdraw from the Collective, they might choose to sell their piece independently. It is up to the individual Collective to set the stipulations or fees when a piece is removed. These parameters should be set up before any contributor wants to remove work to ensure equitable treatment, but can fluctuate depending on market forces. Exit fees can be established to encourage contributors to remain part of the Collective after the Collective's resources have been dedicated to a given creator or work.

It is reasonable that some organizations may create art communally, in which case if a contributor wants to sell the work separate from the Collective, they may need to exchange their [receipt token](#) or fractions of it instead of selling the art itself.

Looking Forward

Content Collectives are the new form of community-owned, media-driven organizations. We have laid out the basic needs for any Collective, but know that as with any people-led group, there will be vast innovations beyond the initial designs laid out here.

There are many different reasons to establish a Collective, but each one needs to define their technology accommodations, contribution value, distribution of value, and user roles at inception in order for the organization to get off the ground. Coming up with strategies for user growth and community engagement are also a critical part to the health of any organization. For simple tools to help you get started, check out Koi Network's [Content Collective template](#). If you have ideas or innovations to add to the next version of this document, [reach out](#).