TECHNOLOGY AND PUBLIC PURPOSE PROJECT

Toward Equitable Ownership and Governance in the Digital Public Sphere

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HARVARD Kennedy School
BELFER CENTER
for Science and International Affairs

REPORT
JUNE 2023

Technology and Public Purpose Project
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Samuel Vance-Law is a Senior Researcher at the DAO Research Collective focused on decentralized governance, DAO legal liability and compliance, DAOs and AI, and how these developing organizations can be leveraged for the public good. He is also a musician whose work focuses on queer rights and equality.

About the Technology and Public Purpose Project (TAPP)

The arc of innovative progress has reached an inflection point. It is our responsibility to ensure it bends towards public good.

Technological change has brought immeasurable benefits to billions through improved health, productivity, and convenience. Yet as recent events have shown, unless we actively manage their risks to society, new technologies may also bring unforeseen destructive consequences.

Making technological change positive for all is the critical challenge of our time. We ourselves - not only the logic of discovery and market forces - must manage it. To create a future where technology serves humanity as a whole and where public purpose drives innovation, we need a new approach.

Founded by former U.S. Secretary of Defense Ash Carter, the TAPP Project works to ensure that emerging technologies are developed and managed in ways that serve the overall public good.

TAPP Project Principles:

- Technology's advance is inevitable, and it often brings with it much progress for some. Yet, progress for all is not guaranteed. We have an obligation to foresee the dilemmas presented by emerging technology and to generate solutions to them.
- There is no silver bullet; effective solutions to technology-induced public dilemmas require a mix of government regulation and tech-sector self-governance. The right mix can only result from strong and trusted linkages between the tech sector and government.
- Ensuring a future where public purpose drives innovation requires the next generation of tech leaders to act; we must train and inspire them to implement sustainable solutions and carry the torch.

For more information, visit: www.belfercenter.org/TAPP

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We Have a Big (Tech) Problem

The harms of dominant technology platforms are manifold and include the exploitation of data and the mental health and safety of minors, the explosion of misinformation, and the negative impact on political institutions and behavior. Big Tech and especially social media companies have therefore become objects of public scrutiny and criticism. However, internal company efforts and external bipartisan attempts to rein in these harms have largely failed.

Potential Solution: Increase Competition by Enhancing Cooperatives with DAO Tooling

Cooperatives (co-ops) are organizational structures that are, unlike Big Tech companies, owned and governed by their users. Co-ops have the potential to provide equitably owned and governed alternatives to Big Tech but have been held back by issues which limit them from scaling effectively, including a lack of organizational transparency, effective governance systems, and member accountability.

However, the tooling recently created by and for Decentralized Autonomous Organizations (DAOs) may help co-ops reach their potential. DAO tooling enables new forms of transparent and immutable co-ownership and governance, and technical and operational pathways for online platforms to organize around principles of equity at scale.

This paper explores how newly developed DAO tooling could help co-ops compete in the online economy. Specifically, we outline how DAO tooling could provide co-ops with:

- **Effective Voting**—DAOs test novel and varied governance systems that appear to offer some unique benefits not available to legacy organizations. These include systems such as reputation-weighted voting, holographic consensus, conviction voting, and quadratic voting.
- **Increased Member Engagement**—DAO tooling allows organizations to gamify milestones for their members, autonomously tracking the progress of members toward their goals, and rewarding them based on behavior. This encourages members to stay on task both for short-term gain and to develop a strong reputation in the long term.
- **Predictable Compensation/Patronage**—DAO tooling can offer insight into the contributions of community members and the payment systems that are directly linked to those contributions. Co-ops could use these tools to make patronage more predictable, transparent, and equitable.
- **Organizational Transparency**—Traditional co-ops, especially at scale, usually become less transparent to their members as they grow. In contrast, on-chain DAO activity like token voting, treasury management, and the payment of salaries and subsidies for public goods can be recorded on an immutable public ledger viewable by anyone with an internet connection.
- **Member Accountability**—It is often hard to identify rule-breakers and enforce accountability as a co-op grows. In a DAO using on-chain reputation, a user's reputation can automatically change based on the quality and quantity of contributions to a community. Reputation can be non-transferable, tied to a particular individual or organization, and recorded on an immutable public record.
- **Improved Capital Formation**—Co-ops are at a significant disadvantage to corporations when raising the funds necessary to scale and compete. DAOs have started experimenting with alternative forms of funding that could ultimately be relevant to co-ops.

RECOMMENDATIONS FOR POLICYMAKERS

These equitable platforms can only realize their potential if policymakers and regulators support them with updated legal frameworks and access to capital similar to their corporate competitors. In order to do this, we recommend that policymakers:

- **Increase access to capital for co-ops** through public infrastructure and debt financing as proposed by the Capital for Cooperatives Act, and beyond, so that they can compete with their corporate counterparts.
- **Provide legal clarity for DAOs at state and federal levels** through new legislation so that DAO stakeholders can operate with clarity regarding liability, ownership, taxation, and other key considerations, increasing the pace and quality of DAO development.
- **Modernize antitrust laws** so they can be appropriately enforced against Big Tech companies and employed to protect fair competition.

1. We Have a Big (Tech) Problem

The harms of dominant technology platforms are manifold and well-documented. From the exploitation of data and the mental health and safety of minors (Foroohar, 2018; Nuñez, 2019; Haidt, 2021; Hughes, 2022; Suciu, 2022; Keller and Conger, 2023) to the moderation of content, the explosion of misinformation, and the impact on political institutions and behavior (Solon, 2018; Alba, 2020; Dwoskin, 2021; Giansiracusa and Marcus, 2023; Guess et al., 2019), Big Tech and especially social media companies have long been the objects of public scrutiny and criticism (Sharon, 2022). Internal company efforts and external bipartisan attempts to rein in these abuses have largely failed; internally because company governance and incentive structures preclude material change, and externally because of lenient courts and a lack of effective privacy and antitrust policy (Freedman and Ma, 2022). Big Tech companies are now an integral part of the lives of billions of people, mediating thought and public discourse ("How Big Tech," 2021). Mounting evidence makes it clear that this influence can be damaging, but we have yet to find the tools to mitigate it. In a letter to FTC chair Lina Khan, Senator Richard Blumenthal (D) and eight other senators explained how Big Tech data abuses are at the core of the tendency toward monopolization, stating that "'Big Tech companies have used their unchecked access to private personal information to create in-depth profiles about nearly all Americans and to protect their market position against competition from startups'" (Toscano, 2021, para. 1). Blumenthal concludes by noting that Americans' "'identities have become the currency'" in a murky and poorly regulated data war (Toscano, 2021, para. 16).

Definitions of Big Tech vary but the term generally refers to the most prosperous and influential technology companies ("Big Tech," 2022). While the arguments in this paper apply, at least in part, to all of these companies, social media platforms exemplify the tendencies inherent in the business practices of Big Tech companies. Specifically, social media platforms have both the financial incentive and legal right to mine as much data as possible, and they rely on that data for profit (Toscano, 2021).

Despite the seriousness of their transgressions, social media platforms have remained largely untouched by regulators, in part because Americans generally lack the protection of effective data privacy laws, and the FTC does not have the tools to check the monopoly (or sometimes oligopoly) power of these platforms.[1] The latter issue results, at least in

1 Some states have passed privacy laws but they are in the minority and those laws have not so far proven effective at materially changing the business models described herein ("US State Privacy Legislation Tracker," 2023).

part, from a narrow interpretation of antitrust laws, and from the business model of social media platforms, which allows them to provide nominally free services to their users. For instance, the FTC and state governments have tried to make the case that Meta operates as a monopoly by undermining competition, buying up its competitors, and restricting access to data as a resource (Kendall and McKinnon, 2020). However, antitrust legal precedence tends to focus on financial harm and, since social media is generally free, antitrust frameworks have been hard to employ against these companies. From the welfare of users to questions of national security, social media companies are not held accountable for other metrics of harm that could be considered as a cost (Toscano, 2021).

These are the combined factors that make Big Tech's influence, and particularly that of social media companies, so pervasive and hard to counter externally. Internally, their governance systems and incentives are incompatible with the democratic societies they cater to, as highlighted by Facebook's previous attempt at providing users with decision-making power on its platform (Kelly, 2012). These companies have privatized the public sphere, replacing democratic forums with centralized algorithmic governance ("How Big Tech," 2021), or worse, the whims of billionaire owners like Elon Musk (Durrani, 2023). Requiring participation in their private enterprises as a prerequisite for participation in public discourse, social media companies in particular have monetized an essential function of the body politic ("How Big Tech," 2021). Operating for the profit of their shareholders and individual owners, they pursue strategies that fail to factor in the welfare of their users. Furthermore, given the gravitational pull of their monopolies and incredibly strong network effects, users often have nowhere else to go if they want to stay connected to their communities.

And that is before the introduction of artificial intelligence (AI). The rapidly increasing sophistication of AI will likely compound the potency of these platforms and the harms discussed above. The requirement of massive computational infrastructure, as well as massive data sets, means that AI reinforces the tendency toward centralization and consolidation. Given the novelty of much of this tooling, we only have a limited understanding of how tech platforms will employ it, but Meta is already using it to push content to its users and to improve ad targeting and user engagement in its Reels video product (PYMNTS, 2023).

In an unhealthy public sphere with no other options, principles of transparency and accountability break down, and democracies subsequently suffer (Confessore, 2018). None of this is a surprise to anyone who has used a social media app or been part of

the discussion around the breakdown in public discourse over the last decade. Far from offering meeting places for unique people and communities, these platforms have created a centralized system designed for "mass data collection and algorithmic governance" ("How Big Tech," 2021, para. 12).

KEY INSIGHTS

- The harms of dominant technology platforms are manifold and well-documented and include the exploitation of data and the mental health and safety of minors, the moderation of content, the explosion of misinformation, and the impact on political institutions and behavior.
- Internal company efforts and external bipartisan attempts to rein in these harms have largely failed.
- The rapidly increasing sophistication of AI will likely compound the potency of these platforms and their associated harms.

2. Potential Solution: Increase Competition by Enhancing Co-ops with DAO Tooling

2.1 Overview of Co-ops

The cooperative is a business model that has often been implemented as a response to exploitation and market failure (Robey, 2022). Co-ops operate with a structure designed for equitable ownership and governance among stakeholders—in contrast to investor-owned corporations—and they do so as an active counterbalance to monopolization. These efforts are built into the history of American enterprise. At the beginning of the 20th century, over 2,600 consumer co-ops sprung up in the United States largely in order to fight the unfair practices of private and company stores, and co-ops continue this practice today (Zimbelman, 2010). At present, responsible for up to 10 percent of the world's employment, co-ops generate more than $2.2 trillion in turnover (Schneider, 2018).

Co-ops operate on the principles of the International Cooperative Alliance, themselves founded on the original Rochdale Principles of 1844 (Robey, 2022). These principles emphasize self-help, self-responsibility, equality, equity, solidarity, social responsibility, and caring for others ("Cooperative Identity," 2023). They set the stage for a more democratic, community-oriented business practice, with long-term growth (rather than short-term gain) as a focus. These tenets make co-ops fundamentally different from the tech giants described above. Co-ops unite to meet economic, social, or cultural needs in jointly-owned, democratic organizations (Walden and Spelliscy, 2020).

Some of America's (and the world's) well-known businesses function based on these principles. REI, Ocean Spray, Navy Federal Credit Union, Pedernales Electrical Cooperative, Tri-State, Sunkist, and Dairy Farmers of America are all co-ops. Some operate as consumer co-ops, owned by their end-users, and others are producer and marketing co-ops, owned by the producers of their commodities and crafts (Walden and Spelliscy, 2020). The Associated Press (AP) is another well-known co-op, formed in 1846 as a cost-sharing measure for local news organizations. Green Bay Packers, Inc. operates outside of the framework of a traditional co-op but is a particularly vivid representation of what community ownership can look like. The team is owned by

360,584 people and has a poison pill provision that prevents the company from ever being sold to another market.

Perhaps the most iconic of the American cooperative projects was, and continues to be, the electrification of rural America. Because only ten percent of rural Americans had access to electricity in the mid-1930s, President Roosevelt created the Rural Electrification Administration (REA) in 1935. Its mission was to provide loans to utilities to serve sparsely populated communities, but investor-owned utility companies refused the opportunity on the grounds that it was not sufficiently profitable. Instead, farmer-owned co-ops applied en masse to the program and started building electrical infrastructure in their communities (Bruggers, 2021; "History," 2023). To support the participation of co-ops, the REA drafted the Electric Cooperative Corporation Act in 1937, "a model law that states could adopt to enable the formation and operation of not-for-profit, consumer-owned electric cooperatives," funded through the Department of Agriculture and implemented at the state level ("History," 2023). Today as the Rural Utilities Service, this program earns more than it costs (Schneider, 2020), is made up of 900 utilities, and comprises an electric system covering more than half the U.S. landmass (Vaheesan and Schneider, 2019).

Co-op practices of compensation and investment differ substantially from those of corporations and may present a potential remedy to some of the ills of a more technologically driven and financially insecure labor environment. Not only are the members of a co-op its owners, but they are also its investors, raising their stake in the enterprise (Walden and Spelliscy, 2020). Whether through membership fees, withholding a portion of net income, or retaining a portion of sales proceeds, members are typically integrally embedded in the raising of capital for their co-op. Distributions to members are tied to their work within the co-op rather than initial investment, however. Members are compensated in proportion to the extent to which they participate in the co-op, whether buying from or selling to the co-op, or marketing goods through it (Walden and Spelliscy, 2020). The resulting structure, which broadly distributes productivity gains and control, has proven to reduce the impact of technological displacement of workers and allows for value distribution to consumers (Gilman and Feygin, 2020).

To the outside observer, a co-op may look like an investor-owned corporation, with management and boards of directors. However, a co-op is owned by its members rather than by shareholders, and members elect their leadership—workers hiring management rather than the other way around (Mannan, 2018). Accountability in such

an arrangement differs fundamentally from the top-down operations of investor-owned companies: those who use a co-op's services are compensated for their activity as well as being responsible for its governance (Schneider, 2018). We are even seeing innovative corporations structuring themselves like co-ops so that their employees see the benefits. Informal Systems, a core developer in the Cosmos ecosystem, has voting shares held by employees on a one person, one vote basis (Flemming and Buchman, 2020). The company looks like an investor-owned corporation, with an executive team and other traditional structures. Internally, however, the governance structure is controlled by the employees who, as voting shareholders, vote on the board of directors and large company decisions.

This cooperative practice stands in stark contrast to the traditional corporate governance models of Meta, Twitter, and their peers. Where users have no governance rights in social media giants, co-ops employ one member, one vote, and where social media giants take user data without compensation, co-ops emphasize shared ownership.

Co-ops are not perfect, however, and have had to deal with the financial and ethical problems all organizations face. In the 1920s, most of the 2,600 consumer co-ops mentioned above failed, largely because wholesalers had problems with rapid growth (Zimbelman, 2021). In 1945, the Associated Press was taken to the Supreme Court for withholding news from nonmember organizations, violating the Sherman Antitrust Act. And while customer satisfaction at electric co-ops is higher than investor-owned companies, they have issues with member engagement, with nearly two-thirds of electric co-ops receiving ballots from less than 10 percent of members in board elections (Vaheesan and Schneider, 2019).

Many co-ops also fail to provide members with transparency about their rights, the size of the co-op treasury, the compensation of management, and other integral functions of the co-op. Member-owned "capital credits" are held by co-ops to the tune of billions of dollars and, regularly unclaimed, co-ops use the associated capital as interest-free financing. When members do try to claim their capital credits, co-ops can be reluctant to pay out. Disputes over recouping equity from capital credits have sometimes lasted for generations (Schneider, 2018).

Scalability also remains a major issue. In traditional centralized corporations, decisions can generally be made and executed quickly. Given that co-op members are more actively involved in the decision-making of their organizations, and that co-op regulations often

impose requirements on co-ops that limit them from scaling, organizing at scale can be virtually impossible.

Co-ops create a basis for democratic ownership and governance but come with no guarantees that people will use these opportunities well. However, while they face many of the business and ethical challenges of their investor-owned counterparts, they also have a much higher standard for accountability, transparency, and democratic governance.

For co-ops to reach their potential and compete with traditional corporations, they need to overcome the issues described above. One path for co-ops to do so, as described in more detail below, is to take advantage of modern tooling and increase access to capital.

KEY INSIGHTS

- Co-ops operate with a structure designed for equitable ownership and governance among stakeholders, in contrast to the centralized corporate governance models of Meta, Twitter, and their peers.
- Some of America's well-known businesses are cooperatives including REI, Sunkist, Ocean Spray, Navy Federal Credit Union, and Tri-State. At present, co-ops are responsible for up to 10 percent of global employment.
- Co-ops are not perfect, however, and suffer from issues including a lack of financial transparency, coordination and scalability limitations, and dated governance systems.

2.2 **Overview of DAOs**

Decentralized Autonomous Organizations (DAOs) have no consensus definition, largely because these organizations are fluid and still in a stage of experimentation and iteration. For the sake of this paper though, we define DAOs as community-led organizations with no formal central authority that use blockchain technology in some capacity, usually to establish the rules of the organization, to record and execute decisions made by members, or to manage a treasury controlled by members.

DAOs and DAO tooling have developed at an exponential rate. Despite being a relatively recent phenomenon, there are now more than 12,000 DAOs in operation according to

DeepDAO, a leading DAO analytics platform. In 2022, the total value of DAO tokens stood at $21 billion (Knaus, 2022), and in 2020 alone the value of assets in decentralized finance (DeFi) smart contracts, governed by DAOs, increased from $670 million to $13 billion (Llyr, Slavin and Werbach, 2023). This remarkable rise represents a small fraction of the impact DAOs could have, not only in the forms in which they are currently being used but also as support for existing organizations in a variety of sectors (Llyr, Slavin and Werbach, 2023).

One of the reasons for the rapid development and adoption of DAOs is the proliferation of innovative tooling developed to help DAOs manage resources, coordinate activities, and make decisions. DAO tooling enables new forms of transparent and immutable co-ownership and governance and offers technical and operational pathways for online platforms to organize around principles of equity at scale. By way of example, DAO tooling includes dashboards that provide members with information on DAO governance, voting, and treasury management, reputation systems that provide members with immutable digital permissioning based on their seniority within the organization, and applications that incentivize and track constructive member activity.

These systems are often set up by collaborators who aspire to decentralize decision-making and operations among the organization's contributors. DAO contributors can typically make proposals on critical decisions, including strategy and treasury management of the organization, which will be voted on by other members of the community. Much of the financial and operational information on DAO activities is made public through blockchain, enabling DAOs to operate with high levels of accountability and transparency (Slavin and Werbach, 2022).

DAOs provide tooling to create equitably owned and governed organizations but no guarantee that people will use that tooling effectively. DAOs have experienced significant growing pains themselves, which extend to their many novel features. These include governance, treasury management, community, technical consistency and security, and legal clarity on structure, liability, and employment. For instance, while DAOs are experimenting with novel forms of governance, many of the largest DAOs employ a system that allows contributors to vote based on the number of tokens that they hold, which has not always proven effective or equitable (Spelliscy, 2021). DAO tooling has also been used by scammers (Perper, 2022).

DAO members also lack clarity on the legal status of their organizations (Spelliscy, 2021). In its recent action against OokiDAO, the CFTC claimed that voting members are personally liable for the actions taken by the DAO. The case is ongoing and, regardless of outcome, speaks to the precarious position of DAO members, who could face significant personal liability for participation (Slavin and Werbach, 2022).

Despite inevitable shortcomings and misuse, DAOs could, like the first co-ops, provide redress for the excesses of industries that no longer serve their users or the community. They could enable users to make critical decisions about platform governance and dispose of the need to trust opaque centralized institutions. Though still in its infancy, this new organizational form could leverage its inherent transparency, speed, adaptability, and democratic ethos to better serve the communities that build it (Slavin and Werbach, 2022).

KEY INSIGHTS

- DAOs and DAO tooling have developed at an exponential rate. There are more than 12,000 DAOs, and in 2022 the total value of DAO tokens stood at $21 billion.
- DAOs have experienced significant growing pains, which extend to the many novel features of DAOs. These include governance, treasury management, community, technical consistency and security, and legal clarity on structure, liability, and employment.

2.3 How Co-ops Enhanced by DAO Tooling Could Compete with Big Tech

The reach of the Internet, the surveillance of user behavior in detail, and the absence of an abuse-curtailing regulatory framework helped Web2 corporations become Big Tech giants. Now, a wave of new technologies, generally built by or for DAOs, could facilitate the rapid growth of co-op models (Patel Thompson et al., 2022). This development would be in keeping with the values of both DAOs and co-ops, as both types of organizations use flat hierarchical structures and decentralized ownership and governance models. Tellingly, it could also be in keeping with the renewed vision of Jack Dorsey himself, the

founder of Twitter, who recently lamented that his biggest regret was Twitter becoming a company rather than a protocol (Nover, 2022).

At present, the co-op movement in the United States lacks the momentum and community energy that underpinned its rapid growth and development in the 1920s and 30s. DAOs, by contrast, have energized tens of thousands of new contributors and billions of dollars in capital in recent years and offer new avenues for engagement. The co-op community could ride the wave of DAO momentum by positioning itself as a critical use case to be supported by DAOs, and DAOs in turn should learn the lessons of the last century and a half of cooperative practice (Patel Thompson et al., 2022).

The innovative tooling created by DAOs could assist co-ops with many of their key challenges and, in so doing, increase their chances of scaling and competing with Big Tech. These key challenges include effective governance and member engagement, compensation and patronage, transparency and accountability, and financing. Despite the potential, DAO tooling is in a nascent and experimental stage, and much of the tooling required to operate reliably is still in development. In order to be accessible at scale, this tooling will need to become much more user-friendly and embrace interdisciplinary, cross-sector design.

2.3.1 **Governance and Member Engagement**

Co-ops could benefit from experimenting with the governance systems and tooling designed and used by DAOs. Co-ops, particularly those that are large and established, tend to base their hierarchies on industrial-age bureaucracies that can be both unwieldy and opaque. Since co-ops operate on the assumption of collaboration, not acquisition, local co-ops often federate and join together, forming co-ops within co-ops at new levels of complexity and integration. For example, there are power suppliers that run power plants, shared mining operations, co-op banks, and co-owned tech firms (Schneider, 2018). Running a cooperative enterprise of this scale and complexity makes governance more challenging and member engagement more critical.

In contrast, DAOs are beginning to use novel and varied governance systems that appear to offer some unique benefits not available to legacy organizations, and which encourage more member engagement (Schneider, 2018). These systems include reputation-weighted voting, where the power of each vote is linked to the token holder's

reputation, holographic consensus, which helps an organization prioritize the most important governance decisions, and conviction voting, where voters can change their vote before a predetermined time limit, but the impact of a token holder's vote increases with the time that it remains unchanged (Nigam, Wandler, and Minicucci, 2023).

Quadratic voting is another compelling example of a novel voting system used by DAOs; it allows voters to allocate votes to express the degree of their preferences, rather than just the direction of their preferences, and checks the power of more well-resourced voters (Lalley and Weyl, 2018). Gitcoin, a prominent DAO focused on public goods funding, has used and iterated on quadratic voting to distribute more than $50 million in funding to a variety of organizations based on the preferences of Gitcoin community members ("Gitcoin History," 2023). The frequency and scale of this use of quadratic voting have helped to test and improve the system, resulting, for instance, in Gitcoin developing an identity solution called Gitcoin Passport to account for possible Sybil attacks ("Gitcoin Passport," 2023). Political parties and governments have also started testing quadratic voting, including the Democratic caucus of the Colorado House of Representatives, the Taiwanese government, and Volt, a German political party ("Quadratic Voting," 2023).

Beyond voting, blockchain tools can be used to motivate DAO or co-op members to stay engaged. One such tool, Mochi, allows organizations to gamify milestones for their members by acting as a lightweight project manager, tracking the progress of members toward their goals, and rewarding them based on behavior. Mochi uses blockchain technology to motivate users to stay on task both for short-term gain and to develop a strong reputation in the long term ("The Game," 2023). This sort of tooling is particularly useful in a world where remote work has become prominent.

2.3.2 **Compensation and Patronage**

Co-ops often have issues determining how much each member should be compensated for their work. Distributions to members of a co-op are proportional to their labor, efforts, and success in using the co-op, also known as "patronage." The more a member patronizes a co-op, the more services that member receives, and/or the more of a co-op's earnings are allocated to that member (Walden and Spelliscy, 2020).

DAO tooling like Coordinape and SourceCred offer insight into the contributions of community members and the payment systems that are directly linked to those contributions. Co-ops could use these tools to make patronage more predictable, transparent, and equitable. Coordinape, for example, allows members of an organization to allocate tokens, called GIVE, to other members of the organization in recognition of value creation, providing insight into compensation decisions. Over time, this collection also allows the organization to better understand which types of work the community finds most valuable and who the key contributors are in various areas ("Coordinape," 2023). The GIVE tokens and related attestations that members receive through Coordinape allow them to build their reputation inside their own organizations, and also allow them to port that reputation externally.

2.3.3 **Transparency and Accountability**

Traditional co-ops, especially at scale, usually become less transparent and therefore less accountable to their members as they grow, in part because they are generally not subject to significant disclosure obligations. DAOs generally hold that transparency is a virtue in its own right, and one of the key promises of blockchain technology is real-time transparency. On-chain DAO activity like token voting, treasury management, and the payment of salaries and subsidies for public goods can be recorded on a public ledger viewable by anyone with an internet connection (Slavin and Werbach, 2022).

DAOs use smart contracts to perform functions including automatic payment upon the completion of work or automatically providing the next step in a workflow. These smart contracts not only allow for prompt payment to contributors but automate trust at scale since they do not require third-party enforcement (Rozas et al., 2021). Using these tools, co-ops could publicly keep track of activities and decisions made by members and management, allowing for sustained levels of accountability and transparency. DAO tooling companies like Tally provide user-friendly dashboards allowing members and managers to more easily keep track of the governance and treasury management of their organizations ("Tally," 2023).

Transparency is one tenet required to create a culture of accountability, but knowing of a transgression is not the same as responding to it. As mentioned above, DAOs are experimenting with the enforcement of accountability on their platforms with concepts like reputation. A user's reputation can automatically change based on the quality and

quantity of contributions to a community. Reputation can be non-transferable, tied to a particular individual or organization, and recorded on an immutable public record. These measures can make accountability in a DAO easier to maintain than in a traditional co-op, where it may be hard to identify rule-breakers and hard to enforce accountability as the organization grows (Mannan, 2018). While developing an effective reputation system on the blockchain is still an ongoing challenge, there are several promising experiments in DAO reputation management. These include those mentioned above as well as those using non-fungible tokens (NFTs), verifiable credentials (VCs), and public key infrastructure (PKI) certificates.

2.3.4 **Financing and Cost Reduction**

Co-ops are at a significant disadvantage to corporations when raising the funds necessary to scale and compete. They can generally only raise capital by direct contributions through membership fees, by agreement with members to withhold a portion of net income based on patronage, or through retention of a portion of sales proceeds for each unit of product marketed (Walden and Spelliscy, 2020). This is largely a policy issue as most co-ops are required to provide personal or entity guarantees on loans, and better access to capital is limited to particular sectors (such as rural electric co-ops, agricultural co-ops, or credit unions).

While securities laws and lack of legal clarity make it difficult or impossible to reliably use blockchain tools for fundraising, particularly in the United States, DAOs have started experimenting with alternative forms of funding which could ultimately be relevant to co-ops. These include selling or airdropping tokens to bootstrap treasuries.

It is important to note that, while we have been focusing on the benefits of co-ops using DAO tooling to operate at a scale that can compete with Big Tech companies, one of the benefits of DAOs is their ability to enable smaller co-ops to form much more easily. Currently, the legal costs of forming a cooperative can be prohibitive for nascent communities, particularly those that organize around shared interests online. The regulatory environment also compels co-ops (especially credit unions, but also others) to consolidate and grow. This makes it difficult for co-ops to remain small enough to be highly participatory. The DAO tooling already mentioned can be used to lower the costs of forming and running co-ops of all sizes.

KEY INSIGHTS

- DAO tooling, with a focus on co-ownership, decentralization, and transparency, could be critical in helping co-ops grow, compete, and coordinate at scale.
- Specifically, DAO tooling could provide co-ops with:
    - **Effective Voting**—DAOs are beginning to use novel and varied governance systems that appear to offer some unique benefits not available to legacy organizations.
    - **Increased Member Engagement**—DAO tooling allows organizations to gamify milestones for their members, autonomously tracking the progress of members toward their goals, and rewarding them based on behavior.
    - **Predictable Compensation/Patronage**—DAO tooling can provide insight into the contributions of community members and the payment systems that are directly linked to those contributions.
    - **Organizational Transparency**—On-chain DAO activity like token voting, treasury management, and the payment of salaries can be recorded on an immutable public ledger viewable by anyone with an internet connection.
    - **Member Accountability**—In a DAO using on-chain reputation, a user's reputation can automatically change based on the quality and quantity of contributions to a community.
    - **Improved Capital Formation**—DAOs have started experimenting with alternative forms of funding that could ultimately help co-ops scale and compete.

2.4 Mastodon Example

The recent growth of interest in decentralized social media—particularly in Mastodon—presents an opportunity to employ the co-op structure combined with DAO tooling at a scale that could compete with centralized social media. Mastodon saw a jump from

300K to 2.5M users between October and November 2022 as a result of recent scandals at Twitter (Binder, 2022). Hosted on thousands of independent servers that each act as their own social networks, members of Mastodon can engage both within their network and with anyone on any other server on Mastodon. With Mastodon, members can do what they would do on a platform like Twitter but within a fundamentally different space. Mastodon does not sell your data. And, as a non-profit, Mastodon neither serves ads nor algorithmically prioritizes certain users or content for profit.

Mastodon is still relatively small, and whether it will one day outpace centralized social media companies is an open question. However, regardless of its long-term success, Mastodon has already demonstrated that decentralized, not-for-profit social media is possible.

It is also not much of a leap to envision Mastodon users running servers as co-ops enabled by DAO tooling given that some of Mastodon's servers are already organized as co-ops. These servers actively apply principles of shared ownership and governance within their community. Nathan Schneider, one of the co-authors of this paper, is a co-founder of one such server, Social.coop, described by another co-founder as a "vision of a user-owned Twitter" (Irving, 2017, para. 3; Schneider and Hasinoff, 2022). The growth of Mastodon and the formation of groups like Social.coop can help us to envision a future of federated independent servers organized as co-ops enhanced by DAO tooling. These servers would be owned and run by their users, with multiple levels of federation that could scale the resources, competitiveness, and network effects of the platform for the benefit of all users.

Such a large and distributed federation of co-ops would be particularly beset by the challenges outlined above—including issues with governance, transparency, member engagement, content moderation, etc.—and would be a strong candidate to use DAO tooling to improve effectiveness. For instance, to capture and implement the preferences of users both at the co-op and federation level, these co-ops could employ the novel voting systems used by DAOs, offering more variety for different circumstances. They could use tools like those listed above to encourage users to take actions that benefit the co-op, to maintain a system of reputation among users, and, if relevant, to allocate patronage to users based on contributions to the co-op.

Trust and transparency will be critical for co-op Mastodon servers if they wish to see long-term success. These co-ops will be composed of hundreds or thousands of individuals who have never met each other in person, who may share very little in common, and will generally have few opportunities to establish trust between one

another. The tooling described above can allow users to establish reputations and provide transparent records of treasury management and governance decisions to increase trust.

Mastodon co-op servers might also take lessons from recently formed blockchain native social media platforms, like Farcaster and Lens, which share a vision of decentralizing control among users. Farcaster and Lens are social graph protocols that allow users to port their identity between applications without having to go through centralized servers owned by corporations like Facebook and Twitter (Christopher, 2022). Unlike legacy social media platforms, Farcaster and Lens are open-source protocols, meaning that anyone can build their own application on top of them. Mastodon co-ops could learn from the design of these protocols, particularly their approach to identity and authentication.

3. Recommendations to Policymakers

While there is a need for legislation to ensure fair competition and limit Big Tech monopoly powers, there is an equal need for legislation that enables equitable competitors to these organizations (Schneider, 2020). We have outlined the advantages of co-ops enhanced with DAO capabilities, but these solutions will only be possible to leverage if policymakers establish a framework that provides DAOs with legal clarity and co-ops with access to capital that puts them on a level playing field.

Government support was crucial to the success of co-ops and it will be crucial to the success of DAOs. For co-ops to excel, they need modern tooling like that being developed by DAOs (Spelliscy and Wilson, 2022). For DAOs to survive and to continue developing relevant tooling, they need regulatory clarity that supports innovation.

3.1 Increase Access to Capital for Co-ops

Co-ops and other forms of employee ownership models have a long history of bipartisan support in the U.S. For instance, Senator Russell Long (D) arranged the Employee Stock Ownership Plan (ESOP) in the 1970s, and Former House Majority Leader, Paul Ryan (R) has been a decades-long supporter. Representative Alexandria Ocasio-Cortez (D) and Senator Bernie Sanders (D) have both introduced resolutions and legislation on behalf of worker-owned businesses, as did Senator Kirsten Gillibrand (D) in a landmark law signed by President Donald Trump (R), in which the co-sponsors were split evenly by party (Schneider, 2019).

To enable co-ops to be competitive with corporations, they need further support from regulators and policymakers. Investor-owned businesses already have access to public infrastructure, from tax advantages to stock markets. Public infrastructure initiatives should be leveraged to encourage investment in shared ownership. Whether through an insurance pool or secondary market (as with Fannie Mae in housing), or through tax initiatives, lowering the risk and the cost for financial institutions to support shared ownership businesses will lead to greater investment and stability in the sector (Gilman and Feygin, 2020).

Furthermore, the rules governing a co-op's access to capital should be revisited. For instance, the Capital for Cooperatives Act would require the Small Business Administration to change its rules so that co-ops could access loans without the typical personal or entity guarantees, opening the door for much more widespread capital access among early-stage co-ops. This proposal is nearly unique in U.S. history, as it supports capital access to co-ops without restricting it to a particular sector (such as rural electric co-ops, agricultural co-ops, or credit unions). This is an essential precedent for enabling co-ops to become a more widespread tool for creative problem solving in the economy. As the bill states: "Research has shown that cooperatives are more resilient to economic business cycles than other business models because cooperatives require member-owners of the cooperative to work together and prepare for the future" (Capital for Cooperatives Act, 2021, § 2, cl. 3). Efforts to create a more resilient economic system in an interconnected and unpredictable world are, in our view, more vital now than ever.

3.2 Provide Legal Clarity for DAOs at State and Federal Levels

Policymakers and regulators need to provide DAO builders with legal clarity that encourages them to experiment and build without fear of reprisal and liability. To foster a relationship between legislators and DAOs, policymakers should actively engage with the industry to take actions like developing legal wrappers for DAOs that help limit the liability of members and enable DAOs to pay taxes as appropriate.

A number of states have recently passed legislation that sets out new legal entity structures for DAOs. Most of these structures are ineffective at present, but it is a step in the right direction, as establishing a legal entity structure well suited for DAOs will be critical to the success of the industry (Teague, 2022). Such a structure could provide DAO members with the limited liability afforded to stakeholders in most other organizations and give them the security needed to develop potentially critical technology.

Since DAOs are still in a nascent stage, legal frameworks should be developed that are flexible enough to account for the ways in which DAOs will evolve over the next several years. DAOs will ultimately need tailored structures to thrive and will have their potential slashed if regulators shoehorn them into existing regulatory frameworks (Slavin and Werbach, 2022). However, they will also require the guardrails and consumer protection laws necessary to cut off potential avenues for abuse. COALA's DAO Model

Law is a proposed framework that shows promise in offering solutions to the needs of regulators and DAO builders. It sets out a detailed framework for DAO regulatory compliance that leans on DAOs' unique ability to provide real-time transparency to stakeholders through their on-chain activity (Choi et al., 2022). Utah, inspired by COALA, has already granted legal personhood to DAOs, and a similar bill in New Hampshire is under review.

As mentioned above, DAOs already have certain intrinsic advantages when it comes to oversight. Regulation is often focused on transparency, requiring registration, disclosure of financial data, and regular filings (Schneider, 2023). DAOs offer a level of transparency not previously possible in co-ops or other traditional organizational forms as much of the relevant data is already publicly available online in real time. That transparency should make it easier for regulators and other stakeholders to have a window into DAO reporting and operations on an ongoing basis, limiting information asymmetries between different DAO stakeholders. DAOs will need to prove that their businesses function as promised, but they will also need room to grow.

3.3 **Modernize Antitrust Laws**

Antitrust laws need to be modernized, updated for Big Tech companies, and then enforced. At present, antitrust enforcement relies on the precedence of cases no longer applicable to the current technological capabilities and monopolization efforts of Big Tech companies. Specifically, the principles of the Sherman Act were based on the desire to advance fair competition and need to be updated to include the competition of markets in which price is not the deciding factor (Toscano, 2021). If legislative frameworks are put in place to allow enhanced co-ops to flourish, fair competition should provide a check on monopolization.

Given the recent history of antitrust enforcement in the U.S., the idea of breaking up a monopoly might seem far-fetched, but the U.S. government has a long record of breaking up monopolies, including logging companies in the 1840s, Standard Oil in 1911, and AT&T in 1982. In 1961 the Supreme Court stated that breaking up companies was "'the most important of antitrust remedies. It is simple, relatively easy to administer, and sure'" (Stoller and Sussman, 2020, para. 5).

However, while updating antitrust legislation to combat the monopolizing tendencies of Big Tech is vital, antitrust laws also need to allow co-ops to compete. At present, although a corporate cartel is rightfully illegal, so is the banding together of small independent contractors and professionals. From Uber drivers to music teachers, home healthcare providers to public defenders, attempts by small players to join together have been repeatedly crushed by legal action (Schneider and Vaheesan, 2019). The Capper-Volstead Act of 1922 provides general immunity for farm co-ops, but antitrust law has too often been used by large corporations to muzzle and disband their smaller co-op competitors (Vaheesan and Schneider, 2019).

The recommendations above are consistent with current antitrust doctrine (if not always its practice), which holds that: "The remedy should be consistent with the underlying goal of antitrust, which is to make markets work better by expanding rather than contracting their offerings—and in a more competitive environment" (Hovenkamp, 2021, para. 17). In order to provide that environment, we need antitrust legislation and enforcement that matches the present need.

KEY INSIGHTS

- Co-ops and DAOs can only realize their potential if policymakers and regulators support them with updated legal frameworks and access to capital similar to their corporate competitors. In order to do this, we recommend that policymakers:

    - **Increase access to capital for co-ops** through public infrastructure and debt financing as proposed by the Capital for Cooperatives Act so that they can compete with their corporate counterparts.
    - **Provide legal clarity for DAOs at state and federal levels** through new legislation so that DAO stakeholders can operate with clarity regarding liability, ownership, taxation, and other key considerations, increasing the pace and quality of DAO development.
    - **Modernize antitrust laws** so they can be evenly enforced against Big Tech companies and employed to protect fair competition.

Conclusion

Web2 enabled the harms perpetrated by centralized Big Tech companies, and DAO tooling could help co-ops compete, ushering in a new wave of transparent, equitably owned and governed organizations. These organizations could empower the public to reclaim the digital public sphere, mitigating harms in the online economy. This vision can only be realized if policymakers support innovation and capital formation, provide guardrails for the positive implementation of DAO technology, and enforce effective antitrust laws.

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