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Decentralized Autonomous Organizations and Policy Considerations in the United States

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About the Technology and Public Purpose Project

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

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Executive Summary

Decentralized Autonomous Organizations (DAOs) can be defined as global, digitally-native organizations which enable people to coordinate and govern shared resources and activities through the use of smart contracts on blockchains.[1] The explosive growth of DAOs since 2020 has led to experimentation, speculation, and investment in this emerging organizational framework.[2] There are an estimated 6,000 DAOs as of June 2022,[3] with participation from contributors around the world and an aggregate treasury value of an estimated $25 billion.[4]

While the web3 space has been marred by scams and bad actors,[5] there are legitimate use cases for DAOs.

Early applications include focuses on fractionalized ownership and control, incentive alignment, resilient operations, and collective action. DAOs demonstrate innovative potential and are producing new forms of tax revenue and employment for the U.S. States have taken various approaches towards legislation, including establishing a DAO LLC.

The U.S. government needs a comprehensive strategy for addressing DAOs as novel organizational structures to retain domestic innovation and protect consumers. Future policy solutions should consider the following:

- DAOs have technical and operational uniqueness that should be taken into account by legislators and regulators.
- The United States must provide legal clarity to retain domestic innovation.
- The friction of existing organizational formation should be reduced and adapted.
- A multi-pronged approach is needed across the federal-level, state-level, and industry self-governance practices.

This report aims to serve as an accessible primer for United States policymakers to understand the unique opportunities and challenges DAOs present, and how these organizations may be addressed in the regulatory landscape of the U.S.

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1 There is no single, widely accepted definition of DAOs as of today, but for the purposes of this report, we define DAOs accordingly.

2 Crypto Fund 4. (2022, May 25). A16z Crypto. https://a16zcrypto.com/content/announcement/crypto-fund-four/

3 Ghavi, A., Qureshi, A., Weinstein, G., Schwartz, J., & Lofchie, S. (2022, September 17). A Primer on DAOs. The Harvard Law School Forum on Corporate Governance. https://corpgov.law.harvard.edu/2022/09/17/a-primer-on-daos/

4 DeepDAO. (n.d.). DeepDAO. Retrieved April 19, 2023, from https://deepdao.io/organizations
DAO treasuries surged 40X in 2021: DeepDAO. (2021, December 31). Cointelegraph. https://cointelegraph.com/news/dao-treasuries-surged-40x-in-2021-deepdao

5 White, M. (2023, April 17). Web3 is Going Just Great. https://web3isgoinggreat.com/

The first section of this report establishes the societal context in which DAOs have emerged, with an emphasis on the trends in organizational frameworks and working conditions to which DAOs respond. The second section describes the underlying technical and structural components that DAOs are built upon. The third section outlines the key purposes and applications of DAOs and shares findings from case studies and semi-structured interviews with 12 DAOs and 20 DAO contributors. The final section provides an overview of existing legislation and concludes by outlining directional considerations for policymakers.

Introduction

What is a DAO?

Decentralized Autonomous Organizations (DAOs) can be defined as global, digitally-native organizations which enable people to coordinate and govern shared resources and activities through the use of smart contracts on blockchains.

The web3 landscape is composed of various technologies (e.g. NFTs, DeFi, Stablecoins) which DAOs, as organizations, may or may not engage with. For example, a DAO may be the organization which manages a stablecoin (e.g. MakerDAO) or a DAO may just be more of a non-profit which leverages a multi-signature wallet to collect and disperse donations (e.g. UkraineDAO). DAOs today typically employ a few key components (further outlined below), including technology such as smart contracts, wallets, and tokens, as well as operational practices such as governance and stakeholder management.

Emergence of DAOs

Cooperative Values

While the technological innovations that make DAOs possible are relatively new, much of the underlying ethos of DAOs is not. For instance, DAOs are frequently compared to cooperatives, which share many values.[6] Cooperatives (e.g., REI, Ocean Spray, and Dairy Farmers of America) and their accompanying legal structures have established a rich history of member-owned and operated organizations motivated largely by problems of economic inequality and societal injustice. DAOs present a reinvigoration of the democratic ideals that have driven the global history of cooperatives and related collectives, likely as a response to the need for more equitable ownership in the corporations that dominate industry today.

6 Co-Ops: The Grandparent of DAOs | Nasdaq. (n.d.). Retrieved April 19, 2023, from https://www.nasdaq.com/articles/co-ops%3A-the-grandparent-of-daos

Many of the efforts of DAOs are also seen as tangential[7] to those of the decentralized web movement (DWeb),[8] which has long advocated for creating a more open, accessible, and trustworthy internet.[9]

Environments for Innovation

While traditional hierarchical organizations (e.g., corporations and governments) have proven their effectiveness in operational efficiency and accountability, their structures make certain trade-offs in regards to collaboration and emergent innovation. Today's technology companies have experimented heavily with new cultural practices and organizational structures that attempt to best foster transparency, inclusivity, and individual agency. Examples like "20% time" and internal hackathons have been pioneered by Facebook and Google, and companies like Zappos and Airbnb have experimented with "holacracy,"[10] a management practice of self-organizing teams, which creates flatter organizational structures as a means of better empowering employees. While these efforts are well-intentioned, they are limited in scope by the inherently hierarchical structure of these companies.

By beginning with principles of inclusivity and participation, DAOs have been able to embrace radically new organizational structures, though they make trade-offs of their own. While traditional organizations begin with a centralized structure that prioritizes operational efficiency, DAOs often begin with a decentralized model that prioritizes inclusivity and collaboration, making a trade-off between efficiency and equity. In the sections below, we'll explore how DAOs are creating organizations with very different structures, cultures, and ownership models.

The Shift to Online Interactions

The COVID-19 pandemic accelerated a shift to remote work, facilitating global connection and collaboration.[11] DAOs have been part of that shift, experimenting with what the future of workplace participation and engagement might look like, and attracting people who have become used to working remotely and now seek structures that more closely match their goals.[12] In the sections

7 Tiffany, K. (2022, October 4). The Battle for the Soul of the Web. The Atlantic. https://www.theatlantic.com/technology/archive/2022/10/internet-archive-decentralized-web-web3-brewster-kahle/671647/

8 DWeb. (n.d.). Retrieved April 19, 2023, from https://getdweb.net/principles/

9 Sverdlik, Y. (2021, September 30). The future of a decentralized web. https://deploy.equinix.com/blog/web3-and-open-source/

10 Holographic Consensus: A scalable voting system in large communities. (2022, October 24). P2P Models. https://p2pmodels.eu/holographic-consensus-a-scalable-voting-system/

11 Mitchell, T. (2022, February 16). COVID-19 Pandemic Continues To Reshape Work in America. Pew Research Center's Social & Demographic Trends Project. https://www.pewresearch.org/social-trends/2022/02/16/covid-19-pandemic-continues-to-reshape-work-in-america/

12 Remote work triggers move to DAOs in the post-pandemic world: Survey. (2022, December 9). Cointelegraph. https://cointelegraph.com/news/remote-work-triggers-move-to-daos-in-the-post-pandemic-world-survey

below, the report highlights how DAO governance structures and tools are enabling the growth and development of global, online organizations.

Components of DAOs

DAOs have several key technological and operational characteristics that contribute to their unique organizational composition.

Technology

Smart Contracts

Most DAOs leverage blockchain technology for at least some of their critical functions. In contrast to operating with legal contracts, enforced by law, to reach agreements, DAOs operate using smart contracts, which reside on the blockchain and are enforced by code. The code in a smart contract establishes the rules and executes the will of the members of the organization without any need for human intervention. This characteristic– the ability to execute and enforce contracts automatically[13]– is what's behind the "autonomous" label in the moniker "decentralized autonomous organizations." For example, if members reach an agreement on spending money out of their shared treasury, the purchase will be executed automatically once the smart contract receives the threshold of required votes or signatures. In practice, many DAO operations are currently not fully autonomous via smart contracts and rely on various methods for carrying out decisions within the organization.

Wallets

A wallet is the primary artifact where tokens and other digital assets are stored.[14] Wallets can be self-custodied, which means that no outside entity is needed to store funds. Anyone can send crypto-assets into the wallet and the wallet activity is published transparently on the blockchain. Only the wallet owner can take out or transfer the assets within their wallet and an individual can have multiple wallets. There is a spectrum of anonymity with a wallet, given that it may not be connected to an individual's personal identity and/or not interact with on or off ramps to fiat currency. In a multi-signature (multisig) wallet, there are several owners of the wallet, and the majority must approve any request for funds to be transferred. For example, a "three of five"

13 Lipton, A., & Levi, S. (2018, May 26). An Introduction to Smart Contracts and Their Potential and Inherent Limitations. The Harvard Law School Forum on Corporate Governance. https://corpgov.law.harvard.edu/2018/05/26/an-introduction-to-smart-contracts-and-their-potential-and-inherent-limitations/

14 Cryptocurrency Wallet: What It Is, How It Works, Types, Security. (n.d.). Investopedia. Retrieved April 19, 2023, from https://www.investopedia.com/terms/b/bitcoin-wallet.asp

multisig wallet would require that three out of five total owners approve any transaction.[15] Multisig wallets are frequently leveraged by DAOs to manage a shared treasury.

Tokens

Crypto-assets, known colloquially as "tokens," are often used by DAOs to convey voting rights over an organization's shared treasury. Like DAO treasuries themselves, tokens are crypto-economic primitives built on smart contracts, and the creative applications of tokens are still in their infancy. The primary use cases of tokens within the DAO ecosystem are permissioning, governance, investment, and infrastructure rewards.

In the case of permissioning, tokens are programmed to secure access to shared resources, property, or tools of the DAO, a practice known as "token-gating." Token-gating creates an easy way for operators to share access to private community boards or DAO-operated digital and physical properties. In these cases, the wallet holder custodying the token is granted the permission that is gated by that token.

In instances of investment, tokens can be used to fractionalize ownership of the treasury. In such cases, tokens represent fractional ownership of the DAO treasury and can be redeemed by depositing the tokens into the treasury in exchange for their portion of treasury assets. Such arrangements can be problematic given the lack of legal clarity around the status of tokens so, recognizing this risk, some DAOs have opted to separate their revenue-accruing tokens from governance tokens, creating a clear asset distinction between governance and security.

DAO tokens, especially governance tokens, are often used to incentivize or compensate contributors. New token "emissions" will be pre-programmed to reward individual behaviors that contribute to the DAO's greater mission. The pre-eminent example of token incentives is the Bitcoin and Ethereum "mining" emissions, which reward network participants, known as "miners," for contributing compute resources to help secure the network. More tactically, some DAOs are incentivizing gig-based contributions in a practice known as "bounties."

15 What is a MultiSig wallet? - Bitstamp Learn Center. (n.d.). Learn Center. Retrieved April 19, 2023, from https://www.bitstamp.net/learn/security/what-is-a-multisig-wallet/

Operations

Governance

DAOs have been a sandbox for experiments in online governance– people from all over the world coming together to coordinate their time and capital, make decisions, find consensus, and self-structure.[16] By organizing around novel technology and digitally-native practices, DAOs are re-imagining and rapidly experimenting with democratic governance structures which could inform existing governance practices in business and politics. A few of the notable governance experiments have included:

- **Liquid democracy:**[17] Voters can delegate their votes to any representative, as well as take them away or switch representatives at any time, or choose to participate directly in voting themselves.
- **Quadratic voting:**[18] Voters are given a specific amount of credits and can allocate these credits towards the option of their choice, scaling in a quadratic manner, to indicate the strength of their preference.
- **Conviction voting:**[19] Voters are continuously expressing their preferences on the proposal(s) they want to pass. They can change their votes at any time, but the longer they keep their preference for a proposal (conviction) the stronger the vote becomes.
- **Holographic consensus:**[20] Voters act as a prediction market by betting if a proposal will pass or fail. If the proposal reaches a certain threshold of voters who all think the proposal will pass, the proposal can pass with only a relative majority instead of an absolute majority.

As discussed in our section on tokens above, DAOs often use cryptographic tokens to represent ownership and to facilitate voting in governance proposals. DAOs have tried various forms of voting, including direct democracy and delegative democracy, as well as the unique mechanisms described above. These organizations typically face many of the same challenges of voter apathy, education, and engagement that established democracies face. Many DAOs reach decisions through a mixture of "off-chain" discussion via forums, proposals, and chat applications, with "on-chain" voting where proposals must meet a certain threshold in order to pass. After "on-chain" voting

16 Murimi, R. (2022). Governance in DAOs: Lessons in Composability from Primate Societies and Modular Software. MIT Computational Law Report. https://law.mit.edu/pub/governanceindaos/release/1

17 Governance Is The Holy Grail For DAOs. (n.d.). Business Tech Guides. Retrieved April 19, 2023, from https://businesstechguides.co/dao-voting-mechanisms

18 Plural Voting. (n.d.). RadicalxChange. Retrieved April 19, 2023, from https://www.radicalxchange.org/concepts/plural-voting/

19 Emmett, J. (2022, April 22). Conviction Voting: A Novel Continuous Decision Making Alternative to Governance. Giveth. https://medium.com/giveth/conviction-voting-a-novel-continuous-decision-making-alternative-to-governance-aa746cfb9475

20 Holographic Consensus: A scalable voting system in large communities. (2022, October 24). P2P Models. https://p2pmodels.eu/holographic-consensus-a-scalable-voting-system/

occurs, the outcomes may be autonomously executed via smart contracts or instead act as a signal of preferences to be enforced "off-chain" by the organization.

Stakeholders

DAOs are typically composed of individuals with various levels of engagement. While many DAOs are fully open to the public for anyone to participate or join, others are exclusive– utilizing token-gating to secure access to their communication channels– and may require an invitation or application to be admitted.

- **Members** of a DAO are a part of the DAOs online community, typically token-holders of the DAOs native governance token (or NFT) and have various degrees of engagement with the organization.
- **Delegates,** in a DAO with a delegative governance structure, are often actively engaged in the DAOs politics and proposals, as they represent multiple members in governance decisions.
- **Core contributors** of a DAO are primarily responsible for building, maintaining, and operating the DAO. These contributors may or may not be paid for their work as contractors or employees. These contributors may also organize themselves into multiple pods or sub-DAOs to separate out different workstreams, and will often articulate a proposal and milestones for their groups' quarterly funding. Many individuals can contribute to multiple DAOs at the same time.
- **For DAOs that use multi-signature wallets**, there are multi-signature wallet signers who are the gatekeepers that must sign-off on any transaction. These signers are meant to execute the will of the members, with typically three out of five signers required for a transaction to be approved.

While in theory power and influence in DAOs is equally distributed within the organization, in practice different stakeholders (members, delegates, contributors, multisig wallet signers, founders, influencers) often have various levels of influence.

Applications of DAOs

While there has been a proliferation of DAOs over the past few years, the space is characterized more by experimentation than anything else. However, this report sought to understand the compelling use cases and purposes for DAOs, and in what ways– if any– they add value over existing organizational structures that operate today (e.g., traditional companies, nonprofits). In many ways, DAOs incorporate the old and the new, serving more as an iteration on existing organizational forms.

The following key applications were developed from a selection of 12 DAOs with a variety of objectives and operating activities based on criteria including influence, team size, maturity, and treasury size. While this is not meant to be an exhaustive representation of the entire DAO landscape, this report seeks to compile a few case studies which illustrate the values and applications of these emergent organizations.

Fractionalized Ownership and Control

Fractionalized ownership is the division of an asset or treasury such that a group of people can co-own and collectively control it. It enables small-scale investors to own assets they individually could not, and allows asset owners to access new forms of liquidity.[21] Today, there is fractionalized ownership for financial securities (e.g., company stock, mutual funds, real estate investment trust, or exchange-traded funds) and real world assets (e.g., Masterworks or Otis for art or Kocomo or Pacaso for homes). However, these use cases face the trade-off between fostering widespread distributed ownership and maintaining active participation among the members, mainly due to weak large-scale coordination mechanisms. So, while the large-scale shareholder model enables widespread ownership, it typically limits active participation in company operations to only important AGM-level decisions and delegation of powers (e.g., board of directors). On the other hand, co-owning a second home on Pacaso, which is a high-engagement proposition, limits co-ownership on a property to a maximum of eight owners.

DAOs potentially solve for this trade-off, while reducing operational frictions of scale and access. Today, DAOs commonly fractionalize ownership in the form of tokens– the tokens are acquired by community members through secure and rapid fundraising, used to govern organization-wide decisions, and may also become increasingly valuable based on the success of the organization. The administrative and legal overhead for attempting to set up a collective ownership organization on a global scale today is challenging, and DAOs have presented a much more transparent and nimble

21 Tross, K. (2021, March 4). Pros and Cons of Fractional Ownership. Pacaso. https://www.pacaso.com/blog/pros-cons-fractional-ownership

solution[22] than many traditional mechanisms to co-own and control assets. As a result, DAOs have enabled fractional ownership of pieces of art, property, and even a popularized bid for a copy of the U.S. Constitution.

> **VitaDAO** funds primarily early-stage research and drug discovery in the space of longevity science. While funding of projects often takes traditional forms, VitaDAO has been the first organization to leverage the IP-NFT framework, developed by Molecule AG, to encapsulate and secure traditional IP elements such as patents, research data, and legal agreements such that these elements can be monetized and transacted using blockchain technology. This framework solves the problem in existing IP structures that (a) prevent the public and patients from having any real ownership in biopharma IP, (b) disincentivize transparency and collaboration by preventing open research data sharing, and (c) addresses the illiquidity of biopharma IP. VitaDAO acquires, supports, and finances new therapeutics and associated IP rights, and fractionalizes those rights which can then be offered to members of their community who wish to participate in developing the assets. People contributing to VitaDAO's research, be it researchers, funders, data or IP providers, or patients, become members of the DAO and are allocated VITA tokens. These governance tokens enable them to have a role in directing the operations of the DAO, as well as managing its IP portfolio. VitaDAO uses an agent-centric model to act as counterparties for IP portfolio management— this includes a Canadian not-for-profit partner as well as a Swiss verein (i.e. association) for managing its soft IP. VitaDAO has deployed over $4m in more than 17 projects and gathered 9000+ community members. Recently, VitaDAO closed a funding round which included investment from Pfizer Ventures.[23]

> **CityDAO** is building the world's first blockchain-native network of properties collectively owned and governed by a community. It is legally registered under Wyoming's DAO LLC law[24] and has acquired land parcels in Wyoming (called 'Parcel 0') and Colorado. Participants (called 'Citizens') acquire tokens (i.e., Citizen NFTs) either by contributing to the DAO's work or by purchasing them from secondary markets, which they use for voting on key decisions for the organization and for accessing City's

22 Can Web3 help enable fairer distribution of wealth? A proposal for fractional property ownership and collective governance in local development. (n.d.). Belfer Center for Science and International Affairs. Retrieved April 20, 2023, from https://www.belfercenter.org/publication/can-web3-help-enable-fairer-distribution-wealth-proposal-fractional-property-ownership

23 About VitaDAO - Longevity DAO - Join us today. (n.d.-a). Retrieved April 19, 2023, from https://www.vitadao.com/about

24 CityDAO Testimony before the 2022 Select Committee on Blockchain, Financial Technology and Digital Innovation Technology. (n.d.-a). Retrieved April 19, 2023, from

https://wyoleg.gov/InterimCommittee/2022/S19-2022061411-02CityDAOTestimony.pdf

facilities. Currently, citizen tokens do not represent a right to land ownership due to challenges in representing real-world assets on-chain. In regards to governance, CityDAO has implemented a two-step voting process wherein a minimum quorum of votes is first required for a proposal to be considered, followed by quadratic voting for counting of yes/no votes. CityDAO is owned and operated by over 5,000 token-holders living in over 500 different physical cities around the world.[25]

Incentive Alignment

The advent of crypto-assets, smart contracts, and DAOs has created a new laboratory environment for experimentation in large-scale human coordination using incentive alignment mechanisms.[26] When applied in this setting, the practice is often referred to as "tokenomics"–a combination of "tokens" and "economics." DAOs provide a unique, iterative environment to test ways of finding fairer methods of allocating funding and making collective decisions.

Gitcoin is a DAO focused on building and funding digital public goods (e.g., open-source software). Today, Gitcoin has run 15 grant rounds helping organizations and communities distribute over $50m,[27] including a recent round in partnership with UNICEF. By leveraging tools such as grants and bounties, Gitcoin has been able to create powerful tools for development work and crowdfunding.

Gitcoin's grants program is a three-sided marketplace with funders bringing in money to the matching pool, grantees or project promoters seeking funds, and community members making small donations. Fund allocations from the matching pool leverage a mechanism called quadratic funding, which allocates funds to projects by prioritizing the number of people who contributed.[28]

Gitcoin itself is a community-governed platform wherein members hold a non-financial governance token (GTC) used for voting on internal decisions. GTCs can also be purchased on secondary markets and can be delegated, allowing "Stewards" to emerge, with their contributions transparently reported to the community using "Steward health cards." More recently, in the spirit of fulfilling their new vision of "enabling communities to fund their shared needs," Gitcoin has shifted its focus to

25 CityDAO. (n.d.-a). Retrieved April 19, 2023, from https://www.citydao.io/

26 Pan, Y., & Deng, X. (2021a). Incentive Mechanism Design for Distributed Autonomous Organizations Based on the Mutual Insurance Scenario. Complexity, 2021, e9947360. https://doi.org/10.1155/2021/9947360

27 Impact Results | Gitcoin. (n.d.-a). Retrieved April 19, 2023, from https://impact.gitcoin.co/

28 Plural Voting. (n.d.). RadicalxChange. Retrieved April 19, 2023, from https://www.radicalxchange.org/concepts/plural-voting/

> building a protocol that allows any community to create its own grants program using different mechanism designs such as quadratic funding, retroactive funding, etc.

Tokenomics is also used to address the "cold start" problem,[29] which refers to the challenge of gaining momentum and scaling from the ground up. In traditional two-sided marketplaces, triggering the start of network effects is plagued by the cold start problem, which refers to the difficulty of getting a new product off the ground and the critical role that networks of people play in helping the product reach a tipping point where the user base will then grow exponentially (e.g. Facebook or Uber), and organizations have typically invested huge time and money upfront to onboard one of the sides before reaping rewards. Tokenomics simplifies and speeds up this process by providing on-chain incentives for early adopters to be rewarded with rights over the platforms they use.

Communities and Collective Action

Existing forms of collective organizing, such as mutual aid networks, have existed throughout history. Recently, many of these networks have emerged in response to crises such as COVID-19 or other natural disasters. These mutual aid networks quickly form to serve as a network of community members distributing information, resources, and support amongst each other. Most have a very local focus, but may rely on existing digital tools such as Facebook, Venmo, or GoFundMe to connect and service those in need.

In both the digital and physical spheres, individuals and communities are dependent on trust and confront challenges including (1) transparency and accountability of donations and funds, (2) coordination of fair and equitable decision making, and (3) leadership and organizational structure. DAOs could present a set of tools which enable connection among people towards a common cause, help communities to scale and coordinate, and give them the ability to quickly pool funds to distribute financial aid.

> **Ukraine DAO** started self-organizing a few days before the full-scale invasion of Ukraine in February 2022.
>
> With the Ukrainian central bank introducing limits on foreign currency transfers in and out of Ukraine to stop the run on the Ukrainian hryvnia, supporters of Ukraine flocked to platforms such as Patreon to donate. Patreon, however, suspended fundraising campaigns to the Ukrainian army, citing violation of the platform's terms of service. Ukraine DAO became the largest donor at the time ($4 million) to Come

29 Chen, A. (2021). The cold start problem: How to start and scale network effects (First edition). Harper Business, an imprint of HarperCollinsPublishers.

Back Alive, a Ukrainian charity supporting the Armed Forces of Ukraine, the Ukraine government's official wallet, and a charity supporting Ukraine's LGBTQ+ community.

Ukraine DAO has since transitioned into other work that supports Ukrainians and acts as a mutual aid network for those impacted by the war. Key efforts have since included organizing a wartime hackathon Kyiv Tech Summit,[30] translating hundreds of articles and videos about Russia's war against Ukraine, and developing a national web3 course[31] launched by Ukraine's Ministry of Digital Transformation. The Ukraine DAO team in Kharkiv has collected evidence which Starling Lab[32] (Stanford, USC) has submitted to the International Criminal Court as part of the first cryptographic dossier submission in the world.[33]

Resilient Operations

Financial institutions need to be stable and credible to function, which is traditionally mandated legally through regulation. DAOs that operate lending, token exchange, and payment protocols attempt to achieve this through decentralization of ownership in addition to their decentralized blockchains. As a protocol and its membership base grows, it becomes increasingly difficult to make changes that hurt the protocol. Once projects mature, DAOs perform a limited set of governance functions (e.g., authorizing protocol upgrades or approving working group budgets).

Moreover, some governance processes of protocol DAOs are autonomous. Proposals are submitted in the form of code that the membership examines and votes on. If the proposal is passed, the code executes automatically via a smart contract. This process eliminates the ambiguity of interpreting organizational decisions and uncertainty about execution quality. However, it also requires a certain degree of technical literacy of the membership. In theory, even if all active members of the DAO stop participating, the protocol could continue functioning in its current state and proposals that were voted in would automatically execute in the future.

MakerDAO collectively manages a stablecoin (a cryptocurrency designed to hold its value at $1 USD) called Dai. It is trusted by many for its decentralized and

30 Kyiv Tech Summit. (n.d.). Kyiv Tech Summit. Retrieved April 20, 2023, from https://kyiv-tech-summit.devpost.com/

31 Educational project on cryptography and blockchain. (n.d.). Retrieved April 20, 2023, from https://osvita.diia.gov.ua/en/crypto-and-blockchain

32 Starling Lab. (n.d.). Retrieved April 20, 2023, from https://www.starlinglab.org/

33 Starling Lab and Hala Systems file Cryptographic Submission of Evidence of War Crimes in Ukraine to the International Criminal Court. (n.d.). USC Shoah Foundation. Retrieved April 20, 2023, from https://sfi.usc.edu/news/2022/06/33571-starling-lab-and-hala-systems-file-cryptographic-submission-evidence-war-crimes

censorship-resistant nature. The Maker protocol has issued $5 billion worth of Dai in exchange for $8 billion dollars of collateral assets.[34] It has also seen real-world adoption. For example, the Mendoza province in Argentina allowed residents to pay their taxes using Dai in 2022.[35]

Many large protocols begin with a centralized foundation to effectively coordinate during initial development. They then aim to decentralize ownership and management through a DAO with a wide membership base. In 2014, the Maker Foundation built the protocol, and in 2021 proceeded to fully dissolve the foundation and transfer its governance and treasury to MakerDAO.[36] This project has been regarded as one of the more successful demonstrations of decentralization.

Contrary to issuers of prominent stablecoins such as UST and USD(C), Maker Protocol does not hold deposits, but instead issues Dai as overcollateralized loans against crypto assets such as ETH. Its smart contracts automatically liquidate collateral in response to price fluctuations and automatically maintain the $1 USD peg. The DAO's primary responsibility is to set the risk parameters of each asset type. In theory, if the Ethereum blockchain runs, the protocol can function even if all the DAO's members stop participating in governance due to legal or other reasons.

34 Dai Stats. (n.d.). Retrieved April 20, 2023, from https://daistats.com

35 Why Argentines Are Turning From Dollars to Stablecoins Like DAI. (2020, December 22). https://finance.yahoo.com/news/why-argentines-turning-dollars-stablecoins-164501779.html

36 MakerDAO Has Come Full Circle. (n.d.). Retrieved April 20, 2023, from https://blog.makerdao.com/makerdao-has-come-full-circle/

Policy Considerations for DAOs

DAOs raise new questions and unique challenges for policymakers. While this is not a comprehensive list, the report highlights a few major topics.[37] The policy areas below will require both state-level and federal-level responses.

- **Jurisdiction:** The people, activities, and output of a DAO are often location agnostic and globally distributed, raising questions of jurisdiction. For this type of organization, those who engage with the DAO could be located in certain countries, with activities or investments carried out in another.
- **Liability:** Without a legal entity, DAOs may be viewed as general partnerships, bringing potential personal liability to anyone involved with the DAO.[38]

  Stakeholder perspective: Individuals involved want to limit their personal liability and not be held responsible for the whole organization, similar to current practices in traditional organizations.

- **Taxation:** There are tax uncertainties for both DAOs and the individuals which engage with them– the DAO treasury itself may invest and sell assets, some individuals may receive an income from a DAO, and some token-holders may sell their tokens on secondary markets. Taxation is made additionally challenging given the open questions of jurisdiction and enforcement.

  Stakeholder perspective: Individuals involved are looking for clarity on how to pay their personal taxes.

- **Securities vs. Commodities:** The debate over whether tokens are securities or commodities, and which regulatory body has authority, has been a major discussion point in the United States. The tokens that DAOs issue may be only used for making governance decisions in a group, may be used to represent some fractionalized ownership, or may be used for both. The SEC and CFTC have both recently released several enforcement actions against DAOs and various crypto-related organizations.

37 Further reading: A Primer on DAOs (https://corpgov.law.harvard.edu/2022/09/17/a-primer-on-daos/); Legal Implications of Decentralized Autonomous Organizations (https://www.ropesgray.com/-/media/Files/articles/2022/04/20220414_Bloomberg_DAO_Article.pdf)

38 Shulga, A. (n.d.). Nelson Mullins—Ooki Dao Is a "Person" That Can Be Sued. Nelson Mullins Riley & Scarborough LLP. Retrieved April 20, 2023, from https://www.nelsonmullins.com/idea_exchange/blogs/fintech-nostradamus/fn-in-the-news/ooki-dao-is-a-person-that-can-be-sued

Additional stakeholder perspectives include:

- **Ability to enter into contracts:** The DAO itself wants the ability to enter into contracts, particularly in order to purchase property, but also for related activities such as employment of full-time contributors or other service agreements. The ability to bring real-world assets on-chain is a key challenge.
- **Anonymity:** Individuals expressed that having some degree of anonymity provided psychological safety[39] within their organization– a freedom to express their ideas and be themselves– which is not always found onsite in the workplace.[40]

Overview of Current DAO Policy in the United States

Current Approaches of DAOs

Today, DAOs are taking multiple approaches towards interfacing with the legal system and establishing legal entities. The choice in approach is influenced by factors such as the purpose of the DAO (nonprofit, investment, etc.), the size of the DAO, the locality of the DAO, and many other variables. The common approaches DAOs are taking today include:[41]

- **Entityless**
- **International entities:** Swiss Foundation, Cayman Islands Foundation.
- **Hybrid organizations:** Many DAOs also take a hybrid approach of having both a registered company for employment, liability etc., and a DAO which owns the governance and treasury.
- **US state-level entities:** DAO LLCs, Colorado LCA,[42] Unincorporated Nonprofit Association, traditional LLC or 501(c)(3).

39 Gallo, A. (2023, February 15). What Is Psychological Safety? Harvard Business Review. https://hbr.org/2023/02/what-is-psychological-safety

40 Gurchiek, K. (2022, September 23). Feelings of Psychological Safety Differ Among Onsite, Remote and Hybrid Workers. SHRM. https://www.shrm.org/resourcesandtools/hr-topics/employee-relations/pages/feelings-of-psychological-safety-differ-among-onsite-remote-and-hybrid-workers.aspx

41 Further recommended reading and analysis on this topic: Legal Wrappers and DAOs (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4123737); Legal Entity by DAO Research Collective (https://daocollective.xyz/legal-entity/); A Legal Framework for Decentralized Autonomous Organizations (https://a16zcrypto.com/wp-content/uploads/2022/06/dao-legal-framework-part-1.pdf)

42 Exclusive Report: Solving the Riddle of the DAO with Colorado's Cooperative Laws. (2021, December 16). The Defiant. https://thedefiant.io/solving-the-riddle-of-the-dao-with-colorados-cooperative-laws/

- **Other individual approaches:** Employment commons (e.g., Opolis,[43] Toku/WorkDAO[44]), personal LLC.

These structures may also change over time. For example, progressive decentralization[45] refers to the journey an organization may take from company to DAO (e.g., Gitcoin) and exit-to-community[46] more broadly refers to turning a company over to its community for shared ownership over the platform. DAOs may need to adapt their legal interfaces accordingly.

Current federal-level legislation

At the federal level, there has primarily been one piece of legislation which references DAOs. The Lummis-Gillibrand Responsible Financial Innovation Act, introduced in the Senate in 2022, proposed that DAOs should be recognized as business entities, and that the IRS tax code should be reformed in order to account for these entities.

The central debate at the federal level is whether to regulate cryptocurrency tokens as commodities or securities. This debate is highly relevant, as DAOs tend to be the default organizational form for crypto projects, and DAOs' natively issued tokens may sometimes fall under securities law.

Current state-level legislation

Several states have already implemented variations of "DAO LLC" laws including Wyoming, Vermont, and Tennessee, with many other states currently in the process of developing their own. States such as Utah and New Hampshire are pursuing alternatives which do not include the requirement for a legal wrapper.[47] Other state-level entity approaches that DAOs have leveraged include the Colorado Limited Cooperative Association (LCA), Unincorporated Nonprofit Association (UNA), and traditional LLC or 501(c)(3) entities. Below is an overview of a sample of current regulatory approaches taken by DAOs in the U.S., with an emphasis on how they address stakeholder needs and other unique features of the organization.

43 Opolis, Inc. is a Delaware corp which provides services to the Employment Commons, LCA, which requires that members form as single member LLC's taxed as S-corps, as part of its decentralized employment organization framework.

44 WorkDAO Whitepaper. (2022, June 22). https://assets.website-files.com/62968292e981d90ff9184f1f/62b3a13d3d6e783c9e3cf722_WorkDAO%20Whitepaper_%20The%20Web3%20Employment%20Partner_Version%201.0.pdf

45 https://a16zcrypto.com/content/article/progressive-decentralization-crypto-product-management/

46 https://www.colorado.edu/lab/medlab/exit-to-community

47 https://www.forbes.com/sites/digital-assets/2023/03/07/-new-hampshire-utah-recognize-daos-as-legal-persons/

	Wyoming DAO LLC	Tennessee DO LLC	Vermont BBLLC	Unincorporated Nonprofit Association	Colorado LCA
DAO Stakeholder Needs Degree to which DAO stakeholders needs addressed denoted by color– green (provides clarity) and yellow (provides less clarity)					
Limited liability	Yes	Yes	Yes	Some states	Yes
Tax guidance	Yes	Yes	Yes	Yes	Yes
Ability to enter contracts	Yes	Yes	Yes	No– association member must personally enter	Yes
Unique Considerations General preferences of DAO stakeholders denoted by color– green (preferred) and yellow (less preferred)					
Member identity disclosure?	Yes	Yes	Yes	No– allows membership to be denoted by token ownership	Yes
Requires registered agent in state?	Yes	Yes	Yes	No	Yes
Allows for profit distribution to members?	Yes	Yes	Yes	Limited	Yes
Smart contract requirements?	Yes– identification of public keys, capable of upgrade or amendment	Yes– identification of public keys, capable of upgrade or amendment	No	No	No
Example	CityDAO	AnchorDAO	dOrg	LexDAO	SongADAO

The state-level efforts have been a positive first step at recognizing DAOs and attempting to provide legal entities for these novel organizations. However, the chart above highlights some of the trade-offs that come with the current options. For instance, while the DAO LLC laws do help limit the liability of the members, they also require member identity disclosure and a registered agent in the state, which are often in opposition to how DAOs operate in practice. While this is a general representation of preferences from DAO stakeholders, each individual organization could have a different calculus based on their needs and operations.

Directional Considerations for Policymakers

1. **DAOs have technical and operational uniqueness that should be taken into account by legislators and regulators.**
   As the above analysis shows, while states have made much progress in developing state-level legislation, many current implementations attempt to shoehorn DAOs into existing LLC structures. Other amendments or models will be needed to meet DAOs' unique needs while maintaining accountability (e.g., COALA DAO Model Law). Given the extremely distributed nature of these organizations, and the challenges of interoperability and jurisdiction, states should align on fundamental approaches and requirements. DAOs require various legal entities based on their purpose and activity (non-profit/impact, investment etc.) similar to existing organizations. Future state-level legislation may explore combining some of the more flexible aspects of the UNA with learnings from existing DAO LLC legislation.

2. **The United States must provide legal clarity to retain domestic innovation.**
   In our globally competitive landscape, it is critical to establish the United States as a leader in this next generation of organizations and innovation. Currently, with a lack of legal clarity in the U.S., many DAOs are opting to remain unincorporated or to register elsewhere around the world through foreign foundations. Additionally, younger generations are increasingly exposed to and familiar with this new suite of web3-related tools. If the United States wants to compete globally, embrace the next generation of innovators, and encourage greater decentralization and equity in our organizations, it must be a leader in proactively creating legal clarity for these novel organizations to operate and innovate in the United States.

3. **The friction of existing organizational formation should be reduced and adapted.**
   In our research, some existing experiments of DAOs do not necessarily require the DAO structure, in certain cases projects could have fit within existing technological and legal paradigms. However, the exponential rise of DAOs underscores the need for new legal structures for modern organizations. Post-pandemic, remote first organizations require the ability to support an international membership and ownership structure. DAOs today fill that space, albeit with ambiguous or absent legal and regulatory guidance. The rise of these new organizations should shed a light on the places where our existing systems and organizations fail us or have too much friction– calling us to revisit how to make existing structures more digitally-native and agile.

4. **A multi-pronged approach is needed across the federal-level, state-level, and industry self-governance practices.**
   There is no silver bullet that will resolve all of the questions around the legal entities of DAOs. At the federal-level, additional clarity regarding securities versus commodities will be necessary, and comprehensive legislation should be developed for the industry. At the state-level, legal

entities tailored towards DAOs should continue to be adapted and experimented with–sharing learnings between states, evaluating how these laws are adopted in practice, and exploring technical regulatory equivalences. Likely, states will compete amongst each other to develop favorable policies to attract DAOs and the tax revenue they provide. Industry self-governance will also play a major role as best practices and industry standards are established.

Conclusions and Outlook on DAOs

While still very experimental, DAOs demonstrate a unique combination of advances in online governance, innovative potential, and scale in coordinating people and capital around the world. By removing intermediaries and threatening internet incumbents, DAOs will inevitably hone their niche– in some cases DAOs may become extremely decentralized and autonomous in nature, while in others traditional organizations may leverage DAO tooling to become "hybrid" organizations. The sandbox experiments in governance and mechanism design, which DAOs are able to rapidly test at scale, may also inform existing practices in business and politics as societies deploy technology in support of democracy.[48]

As DAOs continue to evolve, the U.S. government needs a comprehensive strategy for addressing DAOs as novel organizational structures to foster domestic innovation and protect those who interface with them.

48 House, T. W. (2023, March 29). FACT SHEET: Advancing Technology for Democracy. The White House. https://www.whitehouse.gov/briefing-room/statements-releases/2023/03/29/fact-sheet-advancing-technology-for-democracy-at-home-and-abroad/

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