

DAO:

**A DECENTRALIZED
GOVERNANCE LAYER FOR
THE INTERNET OF VALUE**

George Samman

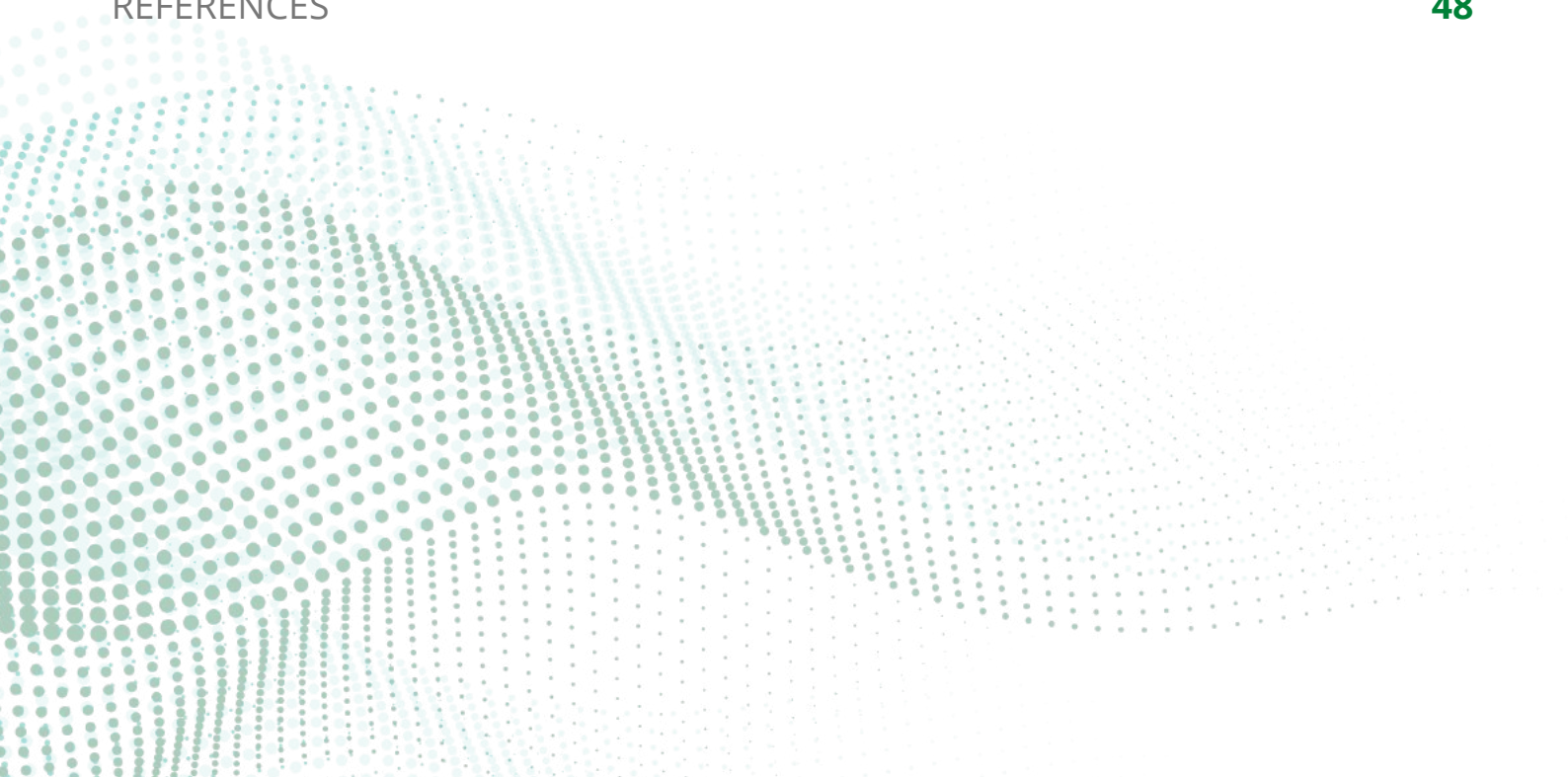
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May 2020

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Acknowledgments

Sarah Miles, PeterPan, Marie Leaf, Kirill Gourov, Alex Kampa, Alex Masmelj, Julien Bouteloup, Kain Warwick, Akseli Virtanen, Mark Roddy, Omar Hannoun, Charlie Smith, Dorjee Sun, Kevin O'Hara, Colin Platt, Daniel Bar, Ron Quaranta, Fran Strajnar, James Zaki, Steven McKie, Matt Prewitt

"Under any economic, social, or political system, individuals, business firms, and organizations in general are subject to lapses from efficient, rational, law-abiding, virtuous, or otherwise functional behavior. No matter how well a society's basic institutions are devised, failures of some actors to live up to the behavior which is expected of them are bound to occur, if only for all kinds of accidental reasons. Each society learns to live with a certain amount of such dysfunctional or misbehavior; but lest the misbehavior feed on itself and lead to general decay, society must be able to marshal from within itself forces which will make as many of the faltering actors as possible revert to the behavior required for its proper functioning." ¹

"In the place of nation-states you will see at first, smaller jurisdictions at the provincial level, and ultimately smaller sovereignties, enclaves of various kinds like medieval city-states surrounded by their hinterlands. As strange as it may seem to people inculcated with the importance of politics, policies of these new ministates will in many cases be informed more by entrepreneurial positioning than political wrangling. These new, fragmented sovereignties will cater to different tastes, just as hotels and restaurants do, enforcing specific regulations within their public spaces that appeal to the market segments from which they draw their customers." ²

"The view that state improves the functioning of the economy by massive reallocation of resources is an anachronism....it should not be forgotten that governments waste resources on a large scale. Wasting resources makes you poor. A dramatic improvement in the efficiency of resource use will arise when revenues historically engrossed by governments come to be controlled instead by persons of genuine talent." ³

"Reciprocity is one of the main forms of human sociality and is defined as: cooperation for mutual benefit. The most complex and far reaching examples of reciprocity are market interactions: trading, buying, selling, producing and other economic activities."

- Olson, Mancur (1987)

¹ Hirschman, Albert "Exit, Voice And Loyalty" 1971

² Davidson and Moog "The Sovereign Individual"

³ Olson, Mancur (1987) 'Diseconomies of Scale and Development'
<https://www.cato.org/sites/cato.org/files/serials/files/cato-journal/1987/5/cj7n1-5.pdf>

INTRODUCTION

There are many misconceptions around what Decentralized Autonomous Organizations (DAOs) are and their purpose. A DAO at its core is a simplistic organizational structure and governance process that allows for the collective management of common goods which can be economic or non-economic.⁴ The future of DAOs, while simplistic now, has the potential to re-create and re-shape the way organizations are structured. It is still very early days being barely 4 years (30 April 2016) since the first DAO was launched. This first DAO aimed to operate as a venture capital fund for investing in cryptocurrency projects and was an unexpected success securing 12.7M Ether (worth \$USD 250M at the time). The space has seen significant development and growth since then and has subsequently sprouted many DAOs and seen a broadening in the scope of use cases. This growth is producing a fertile platform for learning, evolution and various forms of adoption.

There are many definitions, assumptions and new terminologies associated with DAOs, and they vary significantly depending on which group you are communicating with. That being said, one of the key assumptions that still warrants clarification is the relationship between decentralized and centralized organizational frameworks. These frameworks are not static points at opposite ends of a spectrum. Rather, the different functions of an organisation operate on a centralization scale.

Another interesting development is how blockchain technology is becoming a platform for capital formation. Decentralized finance uses applications built on open, public blockchains (like Ethereum or Bitcoin) to facilitate financial services to anybody, anywhere without the need for traditional financial intermediaries. Cryptocurrencies and digital assets can be moved directly within the DAO itself. While DAOs have been discussed and experimented with for the last four years, only now have they become the logical extension of the capital formation piece. This extension was first realized with Ethereum and MakerDao,⁵ which was one of the first DAOs and Decentralized Finance (DeFi) projects to be built on Ethereum. Decentralized Finance (DeFi) has the potential to spur growth in the formation of DAOs, particularly investment/for-profit DAOs. Despite the potential that DAOs present, they face challenges from legal, governance and security perspectives.

DAOs are as diverse as humanity itself. There are many different categories and feature sets. However, there is one key similar feature amongst DAOs: the collective management of common goods via decentralized governance. The opportunities ahead will be in the formation of new types of organizations based around the interactions between token holders and decentralized governance.

⁴ These can be political systems, donations, cultural works, natural resources, investing, lending etc.

⁵ <https://makerdao.com/en/whitepaper>

DAOs make interaction, collaboration, revenue sharing and risks (organization, community) programmable for the first time. This is allowing for an entirely new design space. The first generation internet protocols were stateless (like HTTP) so they needed a data layer for any application functionality. The organization of the "state" of the data layer was provided by the winners of yesterday: Google(for search), Facebook (for social), eBay (for commerce). This allowed them to capture value and drive centralization of the internet. But now the value capture model based on centralized control of the data layer is becoming obsolete: one can not have a competitive advantage based on control of data anymore when we know how to keep a "state" in a decentralized way. Alternatives are now available for people to govern themselves, belong, interact, participate, share ownership, create value, take risks and invest together. The structure of a DAO and the way the community comes together forms the value creation layer.



KEY TAKE-AWAYS

- The key feature that changed organizations over the years has been: reducing transaction costs to coordinate. This is reflected in Coase's Theory of the Firm. You can achieve marginal improvements, such as applying decision support systems within an organization, but every once in a while, a large systemic change occurs that at first looks like a marginal benefit, but in essence enables wholly new types of organizations to exist.
- DAOs not only allow for the reduction of transaction costs, but new organizational forms and compositions to be created.
- In order to have a highly functional DAO, members must:
 - Have equal access to the same information for decision-making
 - Face the same costs for transacting their preferred choices
 - Base their decisions on self-interest and the best interest of the DAO (not on coercion or fear)
- DAOs attempt to solve coordination problems by solving problems associated with collective actions by aligning individual incentives with globally optimal outcomes (for people or corporations). By pooling funds and voting on fund allocation, stakeholders share the costs and incentivize coordination so the entire ecosystem benefits.
- DAOs are performing the biggest experiment in new forms of alternative governance. These experiments are not in the form of giant nation-states but applied on a local community level. This comes at a time where peak globalization is in the rear-view window and the world is retreating to a more local model.
- It is important to note, Bitcoin was the first DAO. It is run without a central authority by a core team of developers who propose decisions on the future direction of the project, mainly through Bitcoin Improvement Proposals (BIPs) which need consensus from all network participants (though mainly miners and exchanges) for changes in the code to be made.
- There will be a growing number of DSaaS (DAO Software as a Service) providers, such as OpenLaw, Aragon and DAOstack, designed to accelerate the growth of DAOs as a category. They will provide on-demand specialized resources such as legal, accounting, and third party auditing for compliance services.
- In a DAO a triangle of tensions exists. This lexicon of the triangle is based on the treatise "Exit, Voice & Loyalty" by Albert Hirschman. These must be balanced to find an optimal outcome which allows the DAO to achieve its mandate:
 - Exit (Individual)
 - Voice (Governance)
 - Loyalty (Decentralization)

- DAOs challenge the traditional hierarchical and exclusive organizational structure as seen in many facets of the world today. Through “wisdom of the crowds” it is possible to have better collective decision making and therefore better-run organizations.
- New products are being made at the intersection of DAOs and Decentralized Finance ⁶(DeFi). As DAOs become more decentralized and digitized using DeFi products as the payment/distribution methods, DAOs will increase and lead to new and more DeFi products being formed to interact with DAOs. This will be most powerful where the DeFi implementations allow the token holders to use governance to customize and optimize the design of the parameters of the application creating a better, tailored user-experience. It can also be used for time locking and creating different types of fee structures.
- DAOs allow for capital to be pooled, that pooled capital to be allocated and to create an asset-backed by that capital. They also allow for non-financial resource allocation.
- Using DeFi enables DAOs to bypass, if they choose, the traditional banking sector, along with their inefficiencies. This is significant as it creates a Trustless, Borderless, Transparent, Accessible, Interoperable & Composable ⁷ corporation.
- DAO community and governance is very complex and difficult to get right, yet is crucial to the success of the DAO. Coordination processes and incentive measures need to be balanced so that all community members feel that their contributions matter.
- Many DAOs will be looking to wrap a legal structure with underlying smart contract code around the entity so as to comply with regulations, provide legal protection and limited liability to their participants and allow for easier deployment of capital.
- DAO is a Misnomer. DAOs today are not fully decentralized, nor are they fully autonomous and in some cases, they may never aspire to be either. Most DAOs will start centralized, then start adopting smart contracts to automate simple internal processes and limit centralized governance. With an aligned purpose, good design, and luck they can grow towards being a truer version of a DAO in time. This misnomer has led to a lot of hype around the distributed autonomy of DAOs versus the reality of what they are today.
- DAOs are not radical or unique to blockchain technology. There is a long history of DAOs to improve governance structures, decentralized decision making, improve and enforce transparency, and enable membership voting and active participation in decision making.
- DAO participation currently targets a niche within a niche within a niche. Many DAOs require minimum staking for participation in a cryptocurrency. This limits participation to the crypto participants who are wealthy, tech-savvy enough, and interested enough to participate in a DAO.

⁶ Decentralized finance uses applications built on open, public blockchains (like Ethereum) to facilitate financial services to anybody, anywhere.

⁷ Creating services with other existing projects by plugging existing projects into your project.

WHAT IS A DAO?

A Decentralized Autonomous Organization (DAO) is an organization where the rules of operation and organizational logic are encoded as a smart contract on a blockchain. The characteristics of a DAO are decentralization, transparency, and independence. The end goal is non-centrally controlled decision making and governance.⁸Note that the rules of operation can include mechanisms to change the rules themselves.

DAOs are currently formulated as a cross-section of a real-world and digital corporation. This formulation combines blockchain technology, organizational structures, legal entities, workflow execution, governance/voting, incentive structures, and contribution/work. Their decentralized and autonomous elements create the opportunity to realign, streamline and automate organizational structure and operational requirements such as governance, voting, asset/wealth distribution, membership/participation, participant contribution, incentives, financial and legal contracts.

DAOs can also be described as an entity that lives on the internet and exists autonomously. Something (be it record keeping, policy voting, and/or money management) must happen on-chain, or at least through some kind of smart contract(s). For example, driverless cars using toll roads could pay fees, automatically schedule and pay for servicing, or even operate as an Uber collecting fees and deriving revenue.

A DAO is essentially a composition of smart contracts built on decentralized infrastructure. Smart contracts are simply programmable transactions.⁹DAO transactions are programmed to execute when the majority of the voters (voters who hold tokens) find consensus and a pre-programmed outcome is activated as a result of the consensus. DAOs may program different voting thresholds for triggering an action or outcome. (e.g. 75% need to agree not just a 50/50 split, or differing levels of quorum in order to pass voted actions.)

Differences

Let's first focus on the features that make a DAO different from traditional organizations. The first difference is the fact that the rules are housed within an immutable computer program. The advantage is that the rules cannot be easily changed, only upgraded, making it resistant to direct attacks on the governance rules. History has shown that one of the ways a democratic country can shift towards dictatorship is by perverting the rules of democracy. A DAO aims to solve these problems but is not there yet. For example, some dictators have been elected or given powers democratically - even Hitler ascended to be Chancellor of Germany through the democratic process. This would also be possible in a DAO as they are presently constructed.

⁸ One of the main benefits of Ethereum is that it enables a community of strangers to pool value together and execute on their shared goals with less need for trust or organizational overhead. Disparate groups of people online can organize by relying on the predictability of blockchain-based "smart contracts" to execute on their group decisions and transfer value according to hard-coded rules in a highly "tamper proof" digital environment. [From OpenLaw]

⁹ For a comprehensive overview of smart contracts see:
<https://bitsonblocks.net/2016/02/01/gentle-introduction-smart-contracts/>

There are also downsides and risks to this, including:

- The program could include bugs.
- Except for simple organizations, it is not easy to write rules that reflect the complexity that characterizes human decision-making.
- There is some rigidity in the system, for example, in unforeseen situations rules cannot be quickly changed
- Code compatibility can be an issue as new code is added with the evolution of DAOs

Note, however, that in the same way as no democratic system is resistant to dictatorship, no DAO is resistant to a change of rules that would essentially give control of the DAO to one person or entity. An example of this has been the global response to COVID-19, where many nation-states have moved to states of exception. In the case of Hungary, the Prime Minister, Victor Orban used the situation to introduce a special state of powers where he will govern by decree for an indefinite period of time. All it takes is a sufficient majority of stakeholders to game the voting process or exploiting/deploying malicious code. Another issue is that the voters will not always be experts in the subjects they are voting on which could lead to poor decisions compared to trusting those decisions to be made (still with governance in place) by executives who have deep subject matter expertise.

Another difference is the decision-making process in centralized versus decentralized corporations. In centralized organizations, decision making power is delegated to a few elected individuals (e.g. board or politicians) governed by a traditional governance system (e.g. separation of powers) In decentralized organizations, decision making is distributed and power is given to all interested parties (e.g. shareholders) as governed by pre-defined rules that exist on decentralized infrastructure.

Anonymity

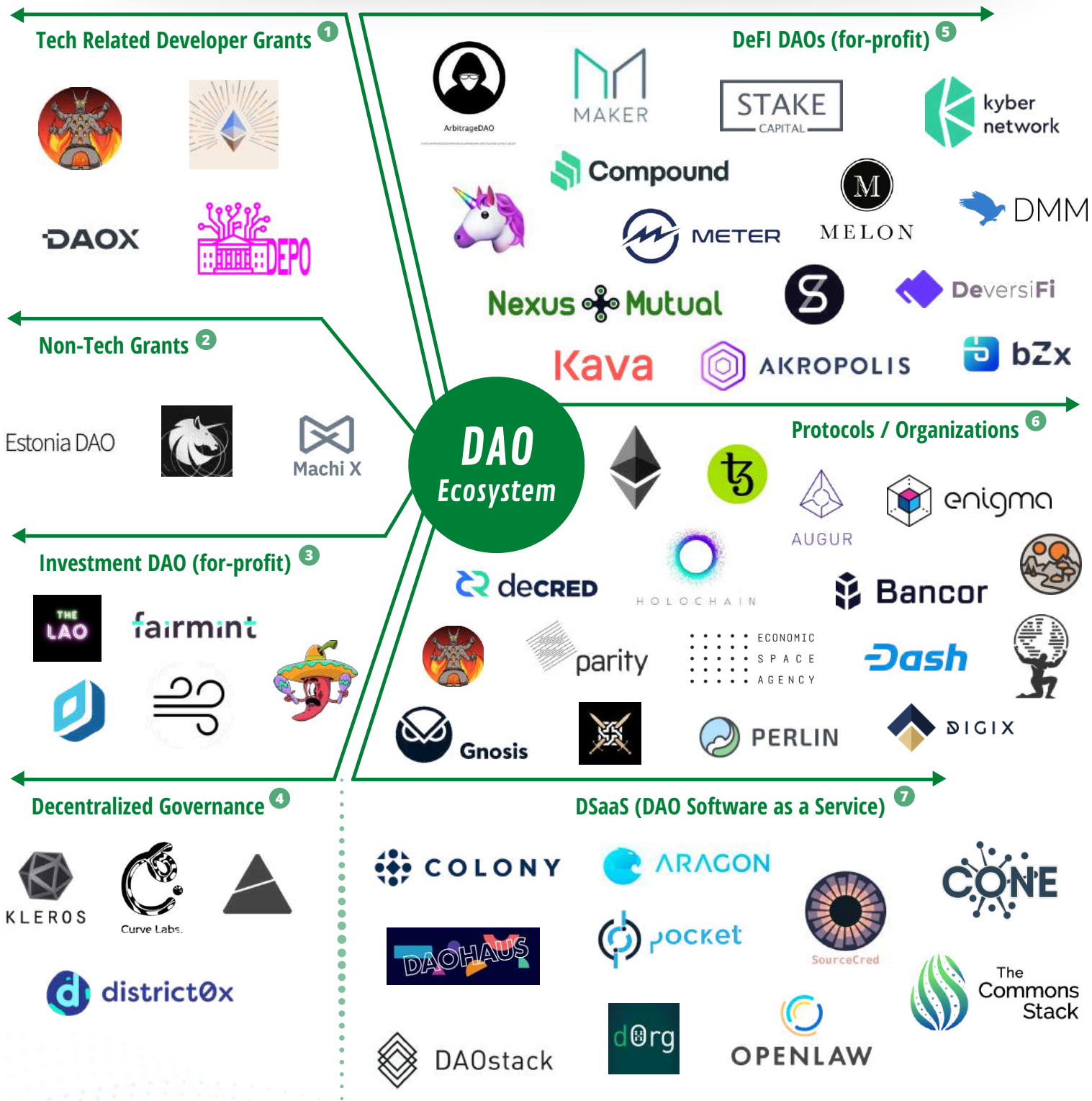
Depending on the blockchain, DAO “shareholders” may be able to remain anonymous or pseudonymous. Some proponents have seen that as an advantage, protection from influence from each other or to prevent factions from occurring. Some participants may also want to remain anonymous due to privacy concerns from certain entities (e.g. government authorities). The downside is legal uncertainty, de facto impossibility to enter into contractual agreements. Another risk is one person or entity secretly gaining control of the DAO (e.g. a potential Sybil attack).

Similarities

In the end, any organization is run by humans, and this applies for the governance of DAOs also. Because human decision-making is typically very complex, encoding this into formal rules is difficult, if not impossible. In other words, even in a DAO most of the decision process will be done off-chain anyway. Think of a democracy, and compare the time spent in debates and discussions to the time spent actually voting.

The hope that by encoding an organization's governance in blockchain smart contracts this will magically solve governance problems was, of course, an illusion. This is not the only issue with DAOs. In contrast with the world-changing ambitions of blockchain / DAO enthusiasts, the governance rules that have been developed for DAOs so far are generally rather simple and lack significant innovation. DAOs are the first iteration of the transition to a programmable medium for both organizations and the economy. Over time this will allow for a greater heterogeneity of organizational and economic structures.

As governance and technology evolve one can be certain that the DAO of today will be very different from the DAO of tomorrow. As DAOs grow and become more common and accepted outside of just the blockchain ecosystem, they may also impact existing organizations as they may see a DAO as a mechanism to improve their own governance and stakeholder engagement.



- 1 **Tech-Related Developer Grants:** These DAOs give grants to teams building out technology and infrastructure on existing platforms. They incentivize developers to build out projects to improve existing protocols/organizations
- 2 **Non-Tech Grants:** Giving out grants for social, economic, political and community-based activities.
- 3 **Investment DAOs (for-profit):** DAOs that invest capital into projects.
- 4 **Decentralized Governance:** These companies are specifically working on building out tools and infrastructure to enable decentralized governance capabilities to be built into DAOs.
- 5 **DDeFi DAOs (for-profit):** These DAOs are building out different parts of the Decentralized Finance stack aka "money legos".
- 6 **Protocols / Organizations:** These are the underlying protocols DAOs are being built on top of. Organizations/Companies are also creating DAOs for token holders.
- 7 **DSaaS (DAO Software as a Service):** Software platforms that provide infrastructure to build out DAOs.

IS DAO A MISNOMER?

For a DAO to be created it requires human decision-making to identify the opportunities, validate the need, possibly find co-collaborators, and to map out the processes that can be automated and built into smart contracts. These are all activities of centralized¹⁰ or distributed teams as coordination, contribution, and communication are key elements to building a DAO.

“How do you bootstrap a decentralized system without being in charge”

DAO Founder: Christoph Jentzsch - AraCon 2019

Other centralized elements:

- Nearly every DeFi smart contract that's capable of holding your funds has an admin key. Some of those admin keys can be used maliciously if they fall into the wrong hands. It's very hard to find out how these keys are protected - some products that live on the blockchain have a kill function, while others have a pause function or a master key to stop and making it difficult from the onset to decentralize. By design, others may disable such functionality after a period (incremental decentralisation), or library contracts.
- The protocol should only be upgraded through the consensus of representative stakeholders. The original team which developed the protocol should not be able to arbitrarily upgrade the logic of the smart contracts.
- A DAO must have a source of funds and a process for allocating those funds for development in a way which is secure.

One of the most interesting and pertinent questions is whether or not DAOs can be integrated into traditional business models to improve operations, reduce operational costs and timeframes, create transparency and streamline automated processes that require transparency. This approach and direction bring with it many challenges, including the logistics of how to decentralize with controlled risk, defining what decentralization means to this specific organization and the scale and speed that this decentralization will take. These decisions are made by a centralized body. There are examples of entities with DAO-like structures that have operated successfully, albeit not with technological structures and benefits of DAOs, these include Coop Unions, Credit Unions, Guilds and even the Green Bay Packers, a publicly held non-profit corporation that owns the Green Bay Packers football franchise of the National Football League (NFL).

¹⁰ <https://bzx.network/blog/introducing-bzxdao>

Because of this centralized to decentralized approach, the definitions around the decentralized component varies greatly DAO to DAO, subsequently, the ease and adoption of greater decentralization is still a long way from becoming a reality.

The construct of Autonomous (in DAO) is challenging, as the definition begets the question, Autonomous from whom? Organizations still need to operate within the legal framework of jurisdictions of its own structure, as well as the jurisdiction of its participants and members. For example, when a not-for-profit employs people, those people are required to pay the tax within the jurisdiction in which they are citizens. There is also evolving SEC (or other financial regulatory body) guidance on whether governance or operational tokens will be defined as securities, currencies, or commodities. This varies greatly as different DAOs need to prove a certain threshold of decentralization.

Many DAO standards are more iterative than revolutionary. They wish to maintain existing legal and social structures of organizations and implement blockchain for transparency-related tasks such as record keeping, yet still maintain the capacity to use traditional methods if required. From a technological standpoint, DAO forks are also an iterative approach which allow members to take existing code and use it for their expressed purposes in building a DAO which is different from the original DAO. An example of this is Moloch DAO.¹¹ The code has been forked by other DAO's in the Ethereum ecosystem.¹² Other smart contract platforms like Kadena have upgradeable code. Pact, which is Kadena's smart contract language is non-Turing complete (no recursive attacks)¹³ and includes formal verification¹⁴ of the code which allows for correctness in the code to be found before smart contracts go live. These iterative technological approaches introduce the transparency and trust layers of blockchain and DAO into an organization's corporate structure but do not necessarily reduce the legal and technical costs of developing DAOs, nor remove jurisdictional and legal uncertainty.

¹¹ <https://concourseopen.com/blog/moloch-dao-explained/>

¹² It's important to note this not only applies to DAOs. See the recent Steemit/Hive fork. Hive forked from Steemit after the takeover. The community left Steemit to form Hive. <https://hackernoon.com/inside-trons-steem-takeover-attempt-and-the-birth-of-the-hive-blockchain-ya1g63249>

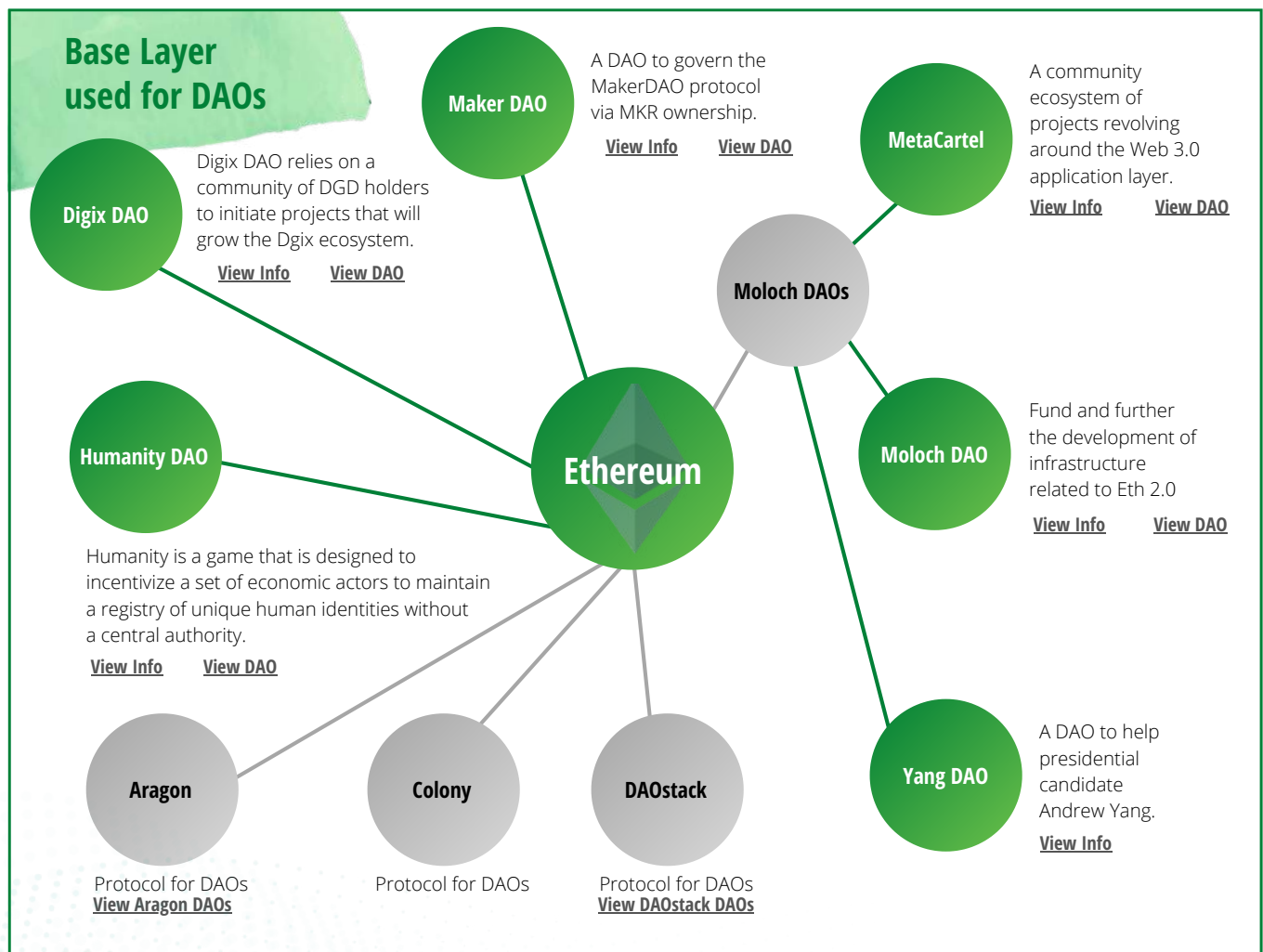
¹³ Note: This how the DAO was hacked.

¹⁴ <https://runtimeverification.com/blog/how-formal-verification-of-smart-contracts-works/>

TECHNOLOGY LAYER FOR DAOs

The Base Layer used for DAOs is based on blockchain technology provided by protocols like but not limited to Ethereum, EOSDac (decentralized autonomous corporation), Tezos, Cosmos, Decred, Dash, Enigma and Colony to name a few. At the platform level, you have companies like Aragon and DAOstack which use solidity and can be considered DSaaS (DAO software as a service) models. DAOs built using Aragon and DAOstack sit at application level. It is important to note that you don't need to use Aragon or DAOstack to build DAOs and that you can fork existing DAOs to create a specific DAO for your needs.

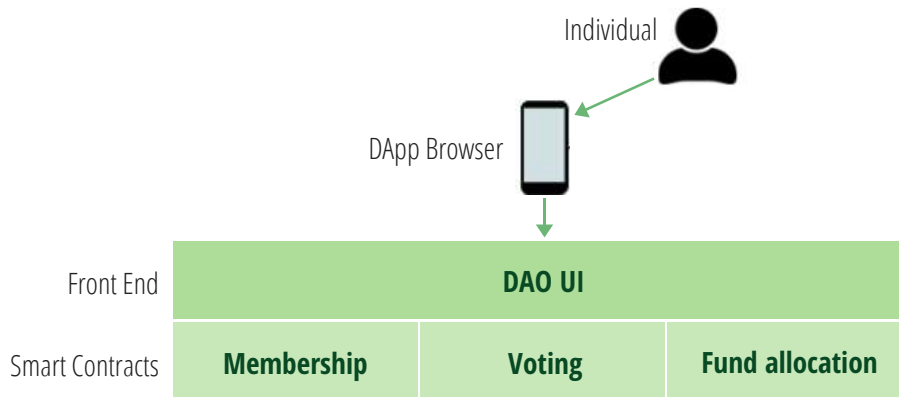
The diagram below shows how The DAO ecosystem is built using Ethereum.



Other technology pieces for DAOs come from the underlying protocol (but can be forked) such as the core consensus mechanism and Improvement Proposals/software upgrades. Synthetix is taking a slightly different approach to this problem, they are deploying “governance by exception” approach.¹⁵

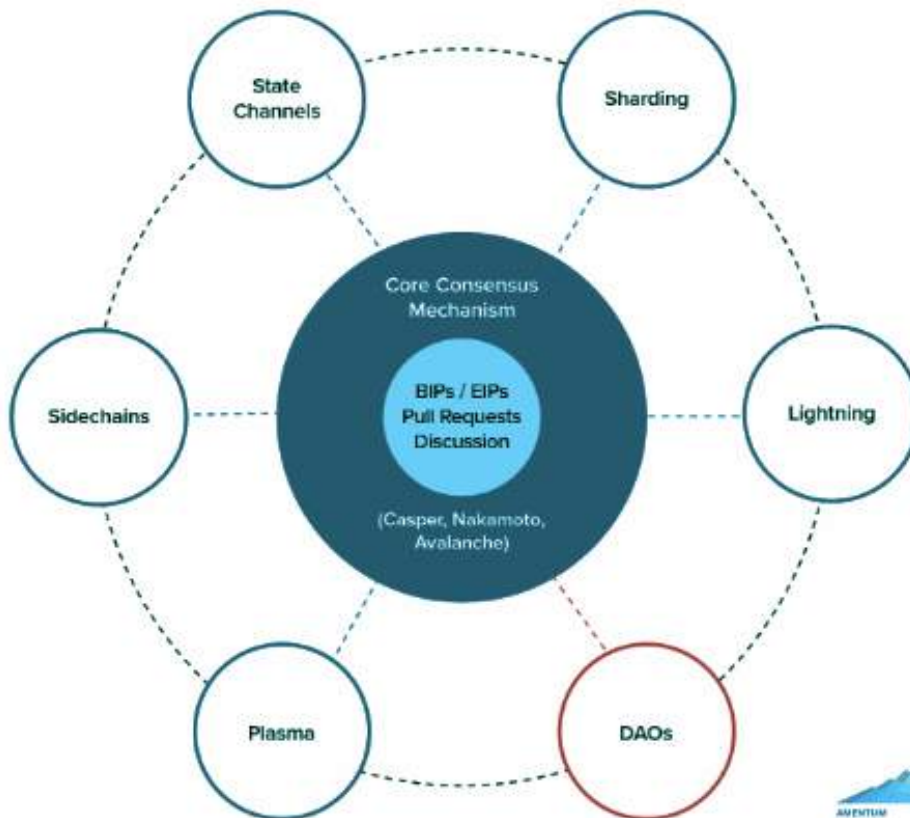
¹⁵ <https://github.com/Synthetixio/SIPs/issues/98>

Governance by exception appoints a council of experts to manage protocol upgrades but allows tokenholders to veto any specific change. This approach focuses on protocol iteration as being critical in the early stages of development. Synthetix is working on this structure with Aragon.



DAOs exist as part of the Layer 2 ecosystem built on top of Ethereum as an example.

See the image below:



16 McKie, Steven 'The Year of the DAO Comeback' (2019)
<https://medium.com/amentum/the-year-of-the-dao-comeback-9c888b44980>

DAOs AND DECENTRALIZED FINANCE (DeFI)

Decentralized finance uses applications built on open, public blockchains (like Ethereum or Bitcoin) to facilitate financial services to anybody, anywhere without the need for traditional financial intermediaries. Cryptocurrencies and digital assets can be moved directly within the DAO itself. This is accomplished through a feature called composability (aka money legos). Composability allows for protocols and applications to be selected and assembled in combinations. An example is how Ethereum is a protocol which MakerDAO, another protocol, is built on top of. MakerDAO is used by many other DeFi applications and those applications use others themselves. DAOs are using these pieces for the treasury function and network value transfer.

The two core pieces that make DeFi flourish in networks are liquidity and collateral. Liquidity is about the state, the banking system it superintends, and the money it issues. DeFi challenges the centrality of the states and the banking system as the source of money issuance, proposing instead p2p reciprocal issuance amongst agents in a network. In normal times, free markets determine what is acceptable as collateral and what is not, and how they can be utilized for leverage. A worker's primary asset is their capacity to work and earn money. In the context of work, the employer (owner) can use the worker as collateral; yet the worker cannot use themselves as collateral. The collateral question is the financial version of 'class'. In DAO+DeFi compositions, all agents can issue assets to be used as collateral.

“DAO+DeFi allows expanding the grammar of finance - freeing it from its narrow use right now - to making intangible, informational, relational values (native to the internet) recognizable and economically expressible - and thus exchangeable, liquid, consumable, spendable and stakeable - without necessarily reducing their information into one index of price and one measuring unit of profitability, without restricting their use by proprietary ownership, without hiding their source code, without needing to monetize them via advertising.”

Akseli Virtanen, ECSA

DAO TENSION TRIANGLE

What is a Tension Triangle

In the instance of a DAO, the tension triangle can be considered a balancing act between three distinct yet equally important components. This is not a traditional trilemma as much as a triangle of tensions. As you slide around, there are tensions that need to be ameliorated between all sides. While it is difficult at times, an optimal mix can be achieved if the dynamics are right. This sliding scale is not a static point in time so moving towards one side and away from another gives different degrees of interaction with each other. It is a balancing act which if approached properly will lead to the long term success of the DAO. Most DAOs use trial and error and gradual adjustment to move toward what the participants feel is optimal. It must be noted that this tension triangle may not hold in the long run existence of the DAO.

A trilemma is different from a tension triangle in that with a trilemma difficult choices must be made between the implementation of three different design options, where one is limited to picking two of the three options. The act of designing a system to implement all three goals is axiomatically impossible, as the combination of their existence counteracts one another. These options can all be unacceptable or unfavorable or they can all be favorable, depending on different contexts or towards different subsets of the affected demographic. Regardless, difficult choices need to be made. All systems have tradeoffs and using a triangle helps map these out.

The three sides of DAO Tension Triangle are based on Albert Hirschman's book "Exit, Voice, and Loyalty." For Hirschman, organizations take shape based on how stakeholders/ members/ citizens respond to perceived declines in the value of products, services, or political representation.

- Exit takes form whenever one either:
 - (1) leaves circumstances one finds disagreeable,
 - (2) withdraws one's consumer faith in a line of commercial products,
 - (3) departs an organization for another better representing one's interests, or
 - (4) in the extreme, forsakes the nationality to which one had pledged allegiance.
- Voice is the articulation of discontent with a product, service, or policy position under conditions. If an individual's voice is not heard, exit becomes a viable option.
- Loyalty to a firm, mission, or policy platform inhibits leaving or complaining about a bad situation; it thereby effectively suppresses tendencies for both exit and voice.¹⁷

So as Charles Tilly observed: 'Voice is more effective and likely when the exit is possible but not too easy. Some loyalty is necessary to voice opposition. If there's no loyalty and exit is impossible, people will have no choice but to suffer in silence. If there is absolute loyalty, no one will voice opposition.'¹⁸

¹⁷ Matthew T. Witt (2011) Exit, Voice, Loyalty Revisited, Public Integrity, 13:3, 239-252

¹⁸ Charles Tilly (1977) "From Mobilization To Revolution"

A DAO, like any organization, must balance the forces of voice, exit, and loyalty. The extent to which a DAO respects the sovereign nature of the individual is the extent to which it permits exit. The Individual is all about **autonomy in participation**. The Individual can choose when to join a DAO and when to leave a DAO as well as choose to participate and vote in all other decisions of the DAO (use their voice).

It maps to free will. The Individual is Exit. Governance mechanisms are the DAO specific design space associated with Voice. Participating in governance and attempting to improve the DAO by being active is governance. This is the Individual using his voice for the greater good. To strengthen governance requires strengthening the voice and weakening incentives for the exit. Decentralization is like Hirschman's concept of loyalty. Decentralization not only describes the technology platform but the attributes and ethos of those who choose to participate in the DAO. It is loyalty which influences whether participants in a DAO will lean towards voice or exit, all else being equal. For DAOs, decentralization along with the people and their motives behind the DAO are the major factors influencing the credibility of the project.

"Decentralization is neither binary nor costless. It involves tradeoffs. It's about achieving enough decentralization to meet the demands of your use case at whatever scale you're aiming for." - Reserve Protocol

Highly centralized organizations engender disloyalty and skepticism (e.g. XRP). Decentralized ones gain a passionate following that may lean towards voice rather than simply leaving, even though it is possible (e.g. MakerDAO). Voice and exit come at the expense of one another. If it is easier to exit, the mechanisms of voice lose some of their importance. If the mechanisms of voice become more binding, it is harder to exit. Loyalty and decentralization influence how these mechanisms are implemented. Decentralization makes mechanism design more difficult, whether it is a voice or exit mechanism, but engenders greater loyalty to the DAO as a whole.¹⁹

The components of the DAO Tension Triangle are:

- **Decentralization (Loyalty)**

- In the context of a DAO decentralization is not just a technical aim but a political one. Decentralization becomes a belief system by which members maintain their loyalty to the DAO. Specifically, how many individuals or organizations ultimately participate in the DAO.
- The degree of decentralization also differs for every DAO and is governed by their purpose, capabilities, and costs of participation.

- **Individual (Exit)**

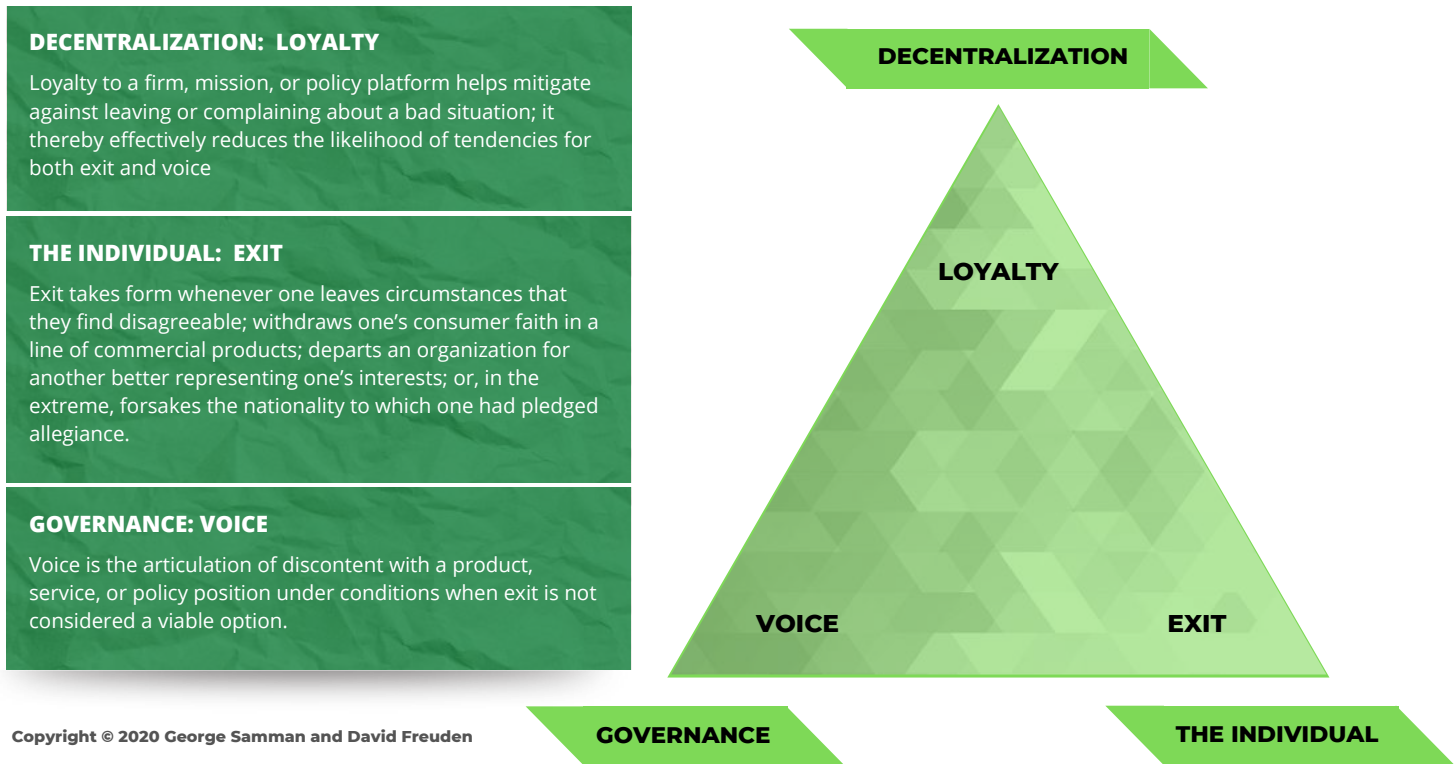
- A person who believes in rights and power for the individual. The individual is often someone who believes in self-governance and the greater good but wants individual rights to be upheld, and who is willing to do things for his/her self. The definition can also extend to include registered or unregistered corporations that operate under the jurisdiction of their lands and are legally treated and defined as individuals.

¹⁹ Inspirations from this came from conversations with Charlie Smith from Reserve.

- **Governance (Voice)**

- Governance rules relate to organization legal structure, operations, purpose, membership, on-chain and off-chain voting, and all facets that enable its existence and dismantling.

DAO Tension Triangle



To better understand the DAO Tension Triangle it's important to understand both the individual definition of Loyalty (decentralization), Exit (the Individual) and (Voice) Governance as well as the relationship each of these have with each other.

GOVERNANCE - DECENTRALIZATION

Decentralization is challenged and limited by centralized elements of governance (discussed below). Allowing for centralized pieces of governance to be modified over time leads to greater decentralization. There are many forms of governance that exist and there are varying degrees of decentralization amongst different projects.

Governance deals with many issues which relate to the community as opposed to the individual. It makes solving them challenging:

1. Arbitration & Conflict resolution
2. Taxation
3. Law of Land or Lands (multiple)
4. Off-chain compliance and transparency
5. Membership process
6. Profit vs Non-Profit
7. Dividend Distribution
8. Fund repatriation (Profit or Loss) of funds impact on tax – DAO or individual?
9. DAO Dissolution
10. DAO break-up value greater than DAO value (if ETH value goes up)
11. Contracting or hiring staff to do work – who and how is this done, recorded, records stored
12. Legally compliant – record keeping, lodging and storing

DAOs have varying degrees of governance “on-chain” and have governance rules for which members can vote and how.

Depending on the importance of the issues, the governance rules of the DAO may limit the ability to vote on the issue, such as funding grants (e.g. cannot vote for your own proposal or sponsored proposals) or the need to activate a pause / kill-switch in event of funding breach,²⁰ such as the recent BzX attack.²¹ If controlled by a few people, this limits decentralization.

Governance activities that happen external to the protocol are called “off-chain” governance, They include: negotiating and entering third party contracts, hiring/firing, and voting (can be on-chain or off-chain).

The complexities between stakeholders and their bargaining power makes designing blockchain governance mechanisms difficult and can challenge the decentralization objectives of the DAO.

²⁰ This applies to a singularly controlled pause-switch, but not if it were a collective super-majority vote. Similarly the constraint to not vote on your own proposal doesn't necessarily mean it's less decentralised, but merely the rules of the DAO individuals vote into. This is similar to quadratic voting.

²¹ <https://haseebq.com/flash-loans-why-flash-attacks-will-be-the-new-normal/>

DECENTRALIZATION - INDIVIDUAL

The larger a decentralized structure becomes the lower the participation rate tends to be. In larger DAOs, the individual may be more marginalized and choose not to participate or be passive, particularly if proxy voting or staking coins through an exchange or pool whereby an individual gives up voting power and the right to participate in governance. If the DAO has a controlling voting entity this has a similar effect, reducing the incentive to participate in DAO governance for individuals. The most recent example of this at the time of writing is the Steemit/Tron hardfork.²²

The larger the DAO gets, the less influence the individual exercises as their perception of their voting power becomes diminished or inconsequential once the individual becomes a smaller part of a large group. This can be seen via Dunbar's Rule and the Ringelmann Effect, which states that members of a group become lazier, disenfranchised, and more detached as the size of their group increases. This stems from the assumption that "someone else is probably taking care of that." In the real world, this occurs in every election cycle in countries where voting is optional, where everyone has the right to vote but only a small percent of people actually do vote.

The MetaCartel (MCV) Whitepaper highlights these tradeoffs:

"MCV's goal is to facilitate a DAO with a focus on open participation where its members are enabled to have a radical level of flexibility in their continued involvement, all while having a right to participate in the management of the DAO (investment decisions, asset management, membership admissions). These goals are naturally in tension: If MCV becomes too open too quickly, the community runs a high risk of either lapsing into a traditional leader/follower org structure or fragmenting into dysfunctional cliques. If MCV is too rigid, it will miss critical opportunities to build the community. MCV will carefully consider all such social, legal, and technical factors to enable a continuous, dynamic readjustment of this delicate balance."²³

²² <https://cointelegraph.com/news/steem-community-resists-takeover-hard-fork-launches-hive-network>

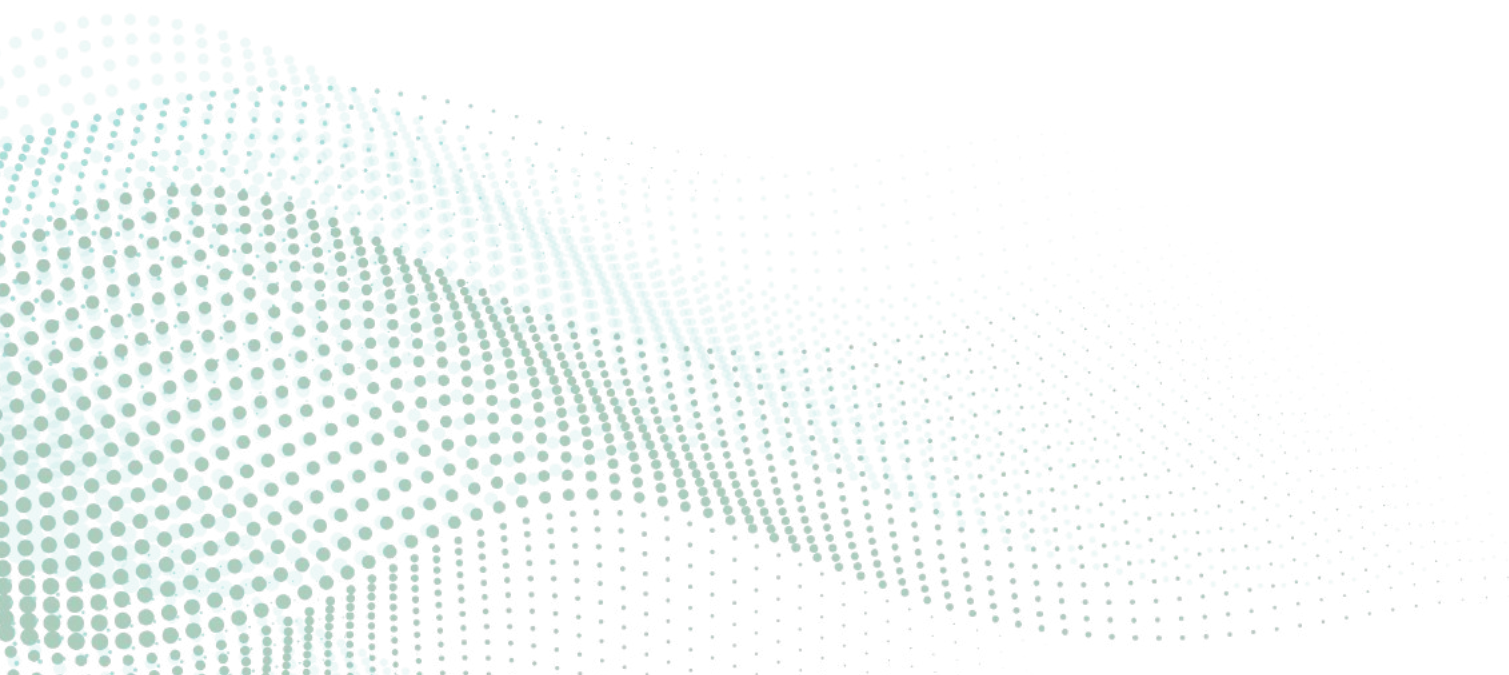
²³ From the Metacartel Whitepaper: <https://github.com/metacartel/MCV/blob/master/Whitepaper.pdf>

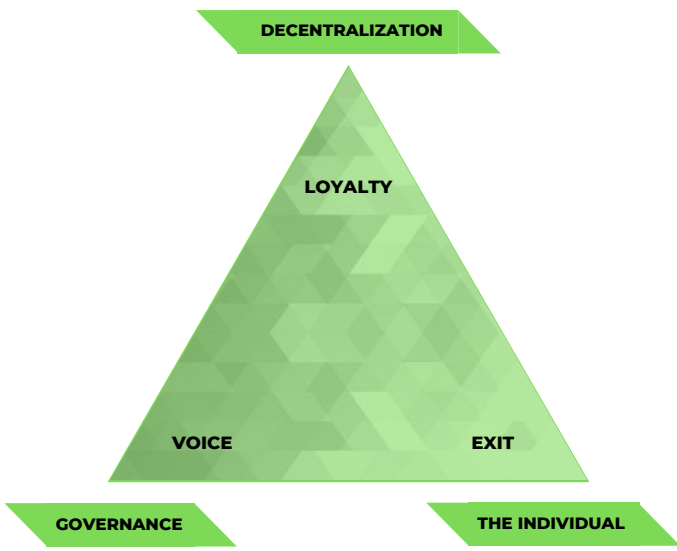
INDIVIDUAL - GOVERNANCE

Decentralization is a sliding scale of how open the DAO is. Fully decentralized would mean anyone can participate and vote/make decisions and become involved in the DAO, but in practice, it doesn't work like this. There would be a tremendous scalability problem for most DAOs as they get bigger or need everyone to vote on and approve every decision. This would make decentralized governance impractical. If you require too little attention from members the decision making could not be in the best interest of most DAO members and lead to collusion and misrepresentation of the majority. If members feel they aren't being represented or their voice isn't being heard they will "ragequit" and take their assets out of the DAO.

Instead, there are many centralizing elements particularly around who can join, how they can join and/or an economic contribution via a staking requirement. This is done through a group of insiders vetting who can join based on reputation, sought-after domain expertise or bank account (whales are always welcome).

For example, the LAO is a member-directed venture capital fund and a registered LLC in the US. They have limited membership to only 100 members in compliance with US Securities law with a 120ETH minimum staking contribution.





Elements of DAO Tension Triangle

DECENTRALIZATION	THE INDIVIDUAL	GOVERNANCE
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- Defining what is on-chain and off-chain. Why?
- Org structure and legal framework for off-chain and commercial operations
- Member participation and decision making
- Niche purpose of DAO
- Member joining criteria

- Arbitration & Conflict resolution
- Voting and participation
- Rage quitting process and impact
- Non-rage quit exit process
- Decision making
- Change of DAO rules with no communication – impact
- Gaming (Hacking) the system
- Malicious actors
- Tax Issues
- Personal Legal exposure if DAO compromised or bad actor
- Identity and data protection
- Member / Public updates

- Arbitration & Conflict resolution
- Taxation
- Law of Land or Lands (multiple)
- Off-chain compliance and transparency
- Technology
- Membership process
- Profit vs Non-Profit
- Dividend Distribution
- Fund repatriation (Profit or Loss) of funds impact on tax – DAO or individual?
- DAO Dissolution
- DAO break-up value greater than DAO value (if ETH value goes up)
- Contracting or Hiring staff to do work – who and how is this done, recorded, records stored
- Legally compliant – record keeping, lodging and storing

GOVERNANCE

Governance is the central piece of a DAO. Since DAOs operate on smart contracts or executable programs/protocols mainly created on Ethereum, DAOs do not have a centralized and conventional management structure. The code for DAOs is often open-source. The governance of this structure gives privileges and the right to vote to participants in the DAO who are geographically distributed but want to participate in the governance process and help the DAO better achieve its goals. All members, unless deferred to a central authority, have a say in the DAO's direction. The purpose of DAO(s) is to code governance and enable participation while minimizing the operations requirements of a corporation to function effectively.

Why Corporations Need Governance

Corporations are not private enterprises. Private enterprises are businesses where the owner, usually a sole owner, family, partnership or private company, are also the managers and in direct control of the business. Corporations are usually public, private-public partnerships, or public-private entities, that are composed of many shareholders and the corporation relies on managers to operate profitably, distribute dividends, and grow the corporation value. Corporations and private enterprises are structurally, operationally, and legally different. This is an important definition to make as governance is primarily focused on corporations, not private enterprise.

When referring to governance this refers to modern corporate governance, which is based on the foundation of the separation of ownership and control, together with dispersed shareholding. This separation resulted in the need to put protections in place so that those controlling the corporation did not steal from those owning the corporation, especially as almost none of the shareholders individually have any insight or influence into the business operations.

In 'The Modern Corporation and Private Property', by Adolf Berle and Gardiner Means, they argue that it was the structure of corporate law in the 1930s that enforced the separation of ownership and control. They also explore the divergence of interest between ownership and control.

“The economic power in the hands of the few persons who control a giant corporation is a tremendous force which can harm or benefit a multitude of individuals, affect whole districts, shift the currents of trade, bring ruin to one community and prosperity to another. The organizations which they control have passed far beyond the realm of private enterprise - they have become more nearly social institutions.”

It is important that DAOs are structured to ensure that management is correctly incentivized to operate for the long term good of the DAO and all their stakeholders. Otherwise, they risk enabling the Principal Agent problem that has grown in many corporations.

The Principal Agent problem occurs, and recurs, when one person or central entity (the "agent"), is able to make decisions and/or take actions on behalf of, or that impact, another person or entity: the "principal".^[1] This dilemma exists in circumstances where agents are motivated to act in their own best interests, which are contrary to those of their principals, and is an example of moral hazard. One example of this behaviour has been the recent and widespread share buybacks of public companies so that agents can benefit disproportionately through bonuses and incentives, at the cost of the long term health of the corporation, such as having cash-on-hand to manage economic downturns.

For DAO governance, even if record keeping is the only function utilizing blockchain tech via a digital registry, this is still a great transparency improvement over existing infrastructure. Individual voting decisions about corporate affairs can be more efficiently implemented if proxy advisory services can advise individual investors directly, and advisory services can provide oracle services to the smart contracts (smart votes) in order to automate individual voting.

The governance rules that have been developed for DAOs so far are generally rather simple and lack innovation. This is not just a DAO problem but a problem in global democracies. Using blockchain technology, new approaches to the problems surrounding democratic governance can be designed to improve:

- Types of voting (eg majority voting, consensus voting, simultaneous voting, multi-stage voting, futarchy.²⁴)
- When to vote, and when to use sortition ²⁵ (random choice)
- Leaders (term limits?)/ Leaderless / Delegation
- Participation incentives to draw voter turnout
- Education and Information around what needs to be voted on and how to vote
- Identity and weight of voting

DAOs, as they exist now, will not be able to change how dispute resolution occurs, however, they will reduce a lot of the possible circumstances in which it will be required.

²⁴ A form of government proposed by economist Robin Hanson, in which elected officials define measures of national wellbeing, and prediction markets are used to determine which policies will have the most positive effect.

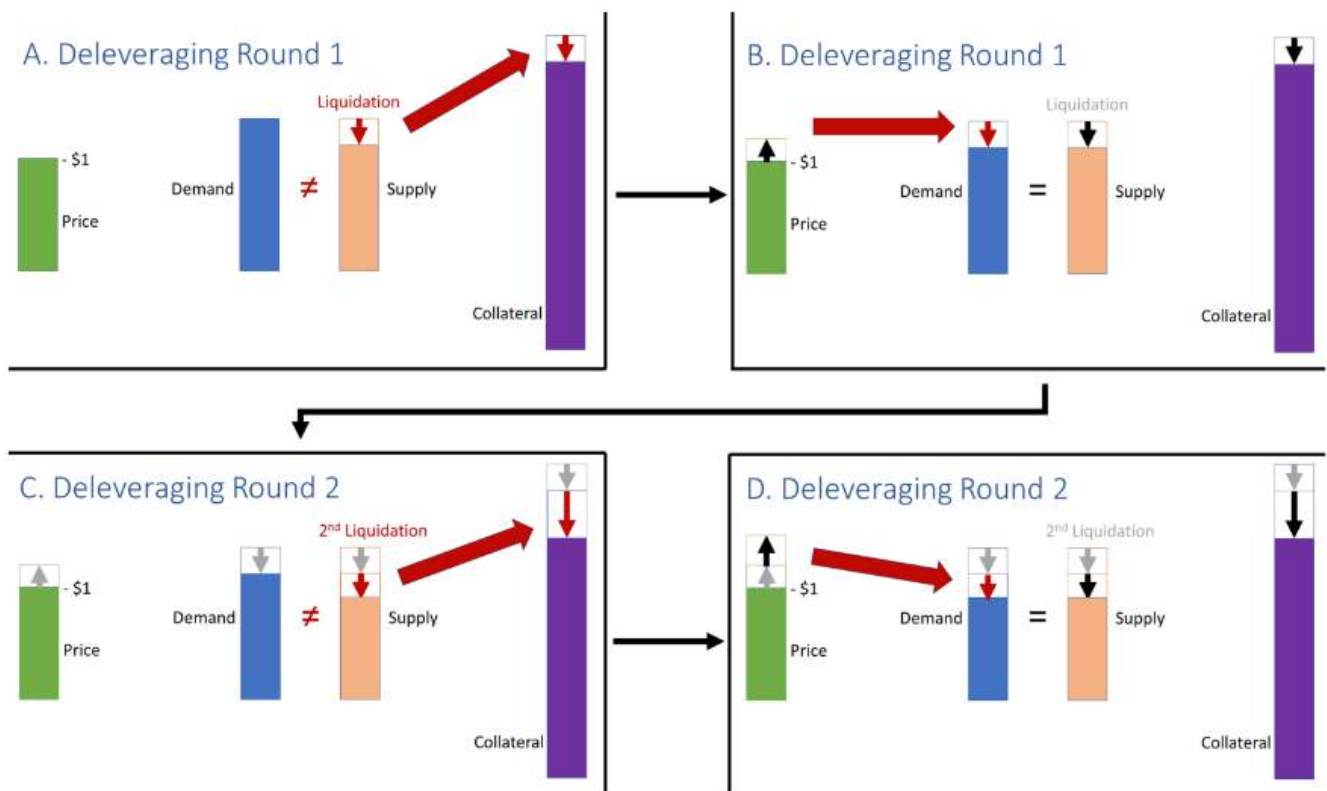
²⁵ Sortition is a way to obtain both scalability and resistance to "demagogues"

Example of Governance: MakerDAO Deleveraging Spiral (Black Thursday) ²⁶

Following the crypto collapse, MKR protocol and MKR governance were able to come to an agreement on governance changes to fix the protocol.

The crypto collapse removed over 50% in value from ETH, BTC, and the crypto market in general. This had a major impact on MKR as it caused a deleveraging spiral.

Ariah Klages Mundt ²⁷ describes this as speculators being forced to repurchase stablecoins at increasing prices as liquidity in the market dries up. ²⁸



Ariah Klages-Mundt's deleveraging spiral diagram ²⁹

²⁶ 'The Market Collapse of March 12 2020: 'How it Impacted MackerDAO' Medium.
<https://blog.makerdao.com/the-market-collapse-of-march-12-2020-how-it-impacted-makerdao/>

²⁷ PhD student Cornell Univerity, applied math. Klages Mundt works on complex systems, including stablecoin and DeFi design and network cascades.

²⁸ https://www.youtube.com/embed/NxpsHA_5Lr4?start=1157&end=1225

²⁹ <https://medium.com/coinmonks/insights-from-modeling-stablecoins-a30e732aef1b>

The speed of the drop in asset prices and the liquidity dries up in the market caused network congestion. High gas prices caused transaction delays and transaction failures. This, in turn, affected the entire Maker ecosystem and its oracles, the pricing data sources for collateral, were affected by the same delays as everyone else.

According to MakerDAO:

“As a result of this, a large number of auctions were triggered, and a subset of those auctions won by bidders who submitted bids decimal points above zero (“zero bidders” submitting “zero bids”). Events leading up to and on March 12 caused an extreme ecosystem-wide shortage of Dai, resulting in Dai struggling to maintain its soft peg to the US Dollar. The unprecedented drop in collateral value triggered auctions for around 1,200 Vaults. Given the network congestion and lack of liquidity, Keepers did not have sufficient Dai or capacity to participate in all 4,447 triggered auctions. Consequently, zero bids could not be challenged as expected under normal market conditions, which resulted in a number of zero bidders winning auctions.”

Decentralized Governance In A DAO

After this massive liquidity event happened the community came together in the Maker Governance Forum to discuss the events and how to best react. MKR holders voted to pass an executive vote to adjust the auction parameters for a limited time to be more congruent with the operational capacity of the Ethereum blockchain. A vote to adjust the risk parameters in response to Dai pushing above the target rate of \$1 followed. Next, Governance proposed the addition of a collateral type uncorrelated with the crypto market to provide diversification and a further source of liquidity. An executive vote resulted, adding USDC as a collateral type. Maker Governance moved fast to vote in Debt Auction parameter fixes and changes and additions to the system. The community also launched further analytic tools, allowing observers to better follow system fixes and changes.

When there is a crisis in governance, it is important to be nimble and adaptive and quick to organize and respond as Maker did in this evolving and unprecedented situation. The governance process needs to be user-friendly and structured and remains that way so decisions can be voted on and executed. In this situation, it was the ability to quickly onboard new collateral types and change risk and auction parameters. It is important to note that getting community involvement, participation, and consensus on these issues leads to a stronger DAO and further strengthens the governance mechanisms.

Another example of a project that has moved toward decentralized governance is Compound. Compound has moved to a DAO like structure where they have issued a governance token COMP which gives all those who own the token the right to participate in community governance and vote on all changes to the protocol (eg adding assets, system parameters).³⁰

³⁰ Leshner, Robert 'Compound Governance is Live' Medium. - <https://medium.com/compound-finance/compound-governance-decentralized-b18659f811e0>

Melonport AG was one of the first companies to wind itself down after the main-net launch and implement its promise of fully decentralized governance. In Feb 2019, Melonport AG handed over control of the protocol to the Melon Council DAO (MCD).³¹ The Melon Council DAO is composed of known parties who can bring technical expertise into the Melon ecosystem. The Melon Council DAO is also open to nominated user representatives. The design of the DAO was intended to protect and represent Melon users who have held the most tokens if something were to go wrong. The DAO currently runs on aragonOS and decisions can be monitored.³²

“The Melon Council DAO has been operating for over a year now. One year on; KyberDAO, Compound, MakerDAO, and SynthetixDAO are unveiling plans to fully decentralize and we’re starting to see the beginnings of a truly self-sustainable financial infrastructure becoming a reality. As more protocols fulfill the decentralization promise, we are set up to learn a lot about how robust the different governance designs hold up in times of crisis. The DeFi DAO models that survive will likely become the DeFi rails for the next few decades.” Mona El-Isa, Founder of Melon Protocol & Avantgarde Finance

³¹ <https://melonprotocol.com/docs/governance/>

³² <https://mainnet.aragon.org/#/0xfe1f2de598f42ce67bb9aad5ad473f0272d09b74/home/>

COMMON DAO GOVERNANCE CHALLENGES

Governance Systems

A common element required across all DAOs is a decentralized governance system: an efficient and resilient engine for collective decision-making at scale. The possibility of thousands or millions of people to make decisions together, quickly and wisely. Consequently, a DAOs greatest challenge is effectively coordinating the dissemination and communication of information and decisions to all members.³³

Staking/Masternodes

This governance model is based on “skin in the game”. Where those who own the most tokens are either masternodes or weighted heavier (based on the amount of tokens owned) in governance decisions. In theory, this should solve the loyalty problem as these nodes/stakers have more to lose than anyone as a result of poor governance decisions. However, it under-represents large portions of the network. This leads to the centralization of the network as a disproportionately powerful minority is making decisions for the entire network. Voting mechanisms such as **quadratic voting**³⁴ and **conviction voting**³⁵ attempt to mitigate against this.

Examples of protocols using masternodes are Dash and EOS. In the Dash ecosystem, a portion of the block reward is held in escrow to be used for the development of the network based on what budget proposals are voted for by the Masternodes and therefore get funded. This gives the blockchain the ability to “mint money” for proposals since voting and funding is built into the protocol. Proposals can sit for a long time and once they hit a threshold are minted. While there is a pool of capital this has to be traded off on masternode/stake voting. Once a vote is accepted, the funding is minted and the block reward gets allocated for these proposals.

Shadow Voting

A shadow vote is a vote cast by a token holder with no economic stake in the protocol. This can be accomplished by borrowing a governance token, voting with it, then returning it to the lender. In the worst case, a shadow vote can be virtually free. The attacker executes a flash loan, votes, and returns the loan within a single atomic transaction, incurring no capital carrying costs or interest payments. There are also Dark DAOs which are decentralized cartels that buy on-chain votes opaquely. In more ideal cases, the attacker is forced to bear capital carrying costs, to pay interest for an extended period, or to expose their collateral to margin calls and penalties.

³³ Based on a conversation with PeterPan, co-founder of Metacartel

³⁴ <https://towardsdatascience.com/what-is-quadratic-voting-4f81805d5a06>

³⁵ <https://medium.com/giveth/conviction-voting-a-novel-continuous-decision-making-alternative-to-governance-aa746cfb9475>

Protocols cannot control second-market interest rates, but they can influence the “cost of governance” by manipulating how much time it takes to complete the voting process.³⁷

In any system where a token can influence governance, it exposes the voting process to collusion and bribery around key decision making. This is one of the biggest attack vectors within a DAO. Plutocracy and cartel-like behavior need to be addressed in the ruleset from the conception in order for a DAO to be a viable, well-functioning, and resilient entity.

DAO Identity

DAOs have varying requirements of identity, ranging from no formal KYC requirement where members remain pseudonymous and are known only by their avatars, such as MetaCartel, through to a DAO requiring social media accounts to be linked to members identity, such as RocketDao. The requirement and type of identity is DAO specific, yet this may change if voted on by DAO members, as DAOs scale beyond their initial group of shared-vision collaborators or possibly if legal and regulatory compliance enforces identity requirements.

In addition to the potential legal requirements for member identity, governance and voting can also be impacted by identity choice. If you can't be identified sufficiently in some cases it may impact your member rights. These can range from KYC/AML of government-issued identity documents through to using existing reputation-based networks such as Google, Facebook, and Twitter to verify identities. Whilst centralized, these networks do defend against fake users, bots, spam links, etc. (Sibyl attacks) by using proprietary, closed-source data, and algorithms.

New DAOs such as SourceCred are developing their own contribution based identity that tracks and assigns reputation and credibility to members based on quality and quantity of contribution.³⁸

³⁷ Monegro, Joel (2020) 'How much Does a Crypto-Vote Cost' Placeholder 7 Jan 2020 - <https://www.placeholder.vc/blog/2020/1/7/how-much-does-a-crypto-vote-cost>

³⁸ <https://sourcecred.io/docs/concepts/cred>

DAO ARBITRATION AS A SERVICE

Aragon has introduced a novel system for DAO Governance called Aragon Court which can be referred to as Dispute Resolution as a Service (DRAAS).³⁹ The Aragon Network already has a native token, ANT. This token is used for governance in Aragon Network votes, with which ANT holders have the opportunity to set the direction of the project and how it allocates its resources. Governance tokens are a common feature of DAOs and are used solely for the aforementioned purposes. There are some issues with regard to these types of tokens which will be mentioned in a later section. Aragon Court has its own native token, ANJ. This alternative token system is used as there is a jury selection process and ANJ is a work token so bad jurors can be punished as they have to stake ANJ to get selected to jury duty.

Aragon Court is a dispute resolution protocol that handles subjective disputes that cannot be solved by smart contracts. This is achieved by having a set of jurors drafted for each dispute who will vote to guarantee a certain ruling.

“Jurors sign up to get drafted into the court by staking and activating ANJ tokens in Aragon Court's smart contract. The more tokens a juror has activated, the higher the chance of getting drafted. Once the court is live, jurors will be able to acquire ANJ either on the open market or by depositing ANT into an Aragon Fundraising-based bonding curve to mint ANJ tokens.”⁴⁰

Once a ruling has been decided "and the decision is not appealed or appeals process has been exhausted, the final ruling is sent to the smart contract that triggered the dispute and all the adjudication rounds for the dispute can be settled, taking into account the final ruling for rewards and penalties. It is important to recognize this is an important attempt to move to an on-chain court and jury, while still having some off-chain elements to it.

How Voting Occurs On Platform and Who Makes The Decisions?

Things that can be voted on:

- Outside expenditures that the organization makes. This could include who to partner with or who to pay money to outside the organization (i.e. developer grants).
- What products/focuses will be on a decentralized organization's roadmap.
- Which additional members can be permitted to mobilize the plan into actual products and code.
- How potential profits/dividends will be distributed amongst the DAO's members and contracted agents.
- Protocol upgrades or technological implementations.

³⁹ <https://blog.aragon.org/aragon-court-is-live-on-mainnet/>

⁴⁰ All information comes from Aragon's description of how the court works. - <https://blog.aragon.org/juror-pre-activation-guide/>

In order to have a well-functioning and resilient DAO it is most important that all members be involved in the governance and decision making processes. However, there is a conundrum that needs to be solved. Many members may not have certain expertise and knowledge in a certain area or won't be available to vote on certain issues for a variety of reasons (away, working on other things, non-contactable). Having all members vote over time will not be scalable. In situations like this, where not all members can vote, it is important for the outcome to represent the global opinion of the DAO. This concept has been dubbed "holographic consensus" by Matan Field of DAOstack.⁴¹ It states:

"The DAO's approximate opinion about a proposal would then be achieved when most opinionated agents have approximately sufficient bandwidth to consider the proposal and express their opinion. A decentralized decision-making system will be denoted resilient if it ensures all decisions made in the DAO to agree with its approximate opinion (or to approximately agree with its global opinion)"

Good governance would allow for segments of a DAO to vote on issues on behalf of the DAO and make sure that the decisions have consensus amongst the "global opinion".

How members are allowed to exit (Moloch allows for "ragequitting", dilution bounds)

"Ragequitting" has become part of the popular DAO lexicon and describes how most DAOs allow members to leave if they don't agree with the consensus, investment and governance decisions of a DAO. It allows members to leave with their holdings as soon as they want to. In many cases, they are allowed to receive distributions from any investments they voted on prior to their leaving.

As Albert O. Hirschman describes it in his book "Exit, Voice, and Loyalty" this is voting with your feet. Hirschman wrote that technological advances would increase the likelihood of exit as a strategy for dealing with states (or corporations) in decline. In the industrial era, he notes, there were great economic advantages to operating at a large scale which the era of technology has rendered obsolete. In the industrial era, it was, therefore, impractical to divide sprawling jurisdictions into enclaves where everyone could have his own way, even on important items. As technology has specialized into niches and decentralization permeates, DAOs are a natural extension of this.

Onchain vs Offchain

In many DAO's activities can happen "on-chain" or "off-chain". For example, MetaCartel describes in its whitepaper that fundraising and asset management are on-chain.⁴² However, many of its decisions will be coordinated through social consensus, using "off-chain" communication channels such as group chats, video meetings, and in-person meetings. These interactions help the members develop and evaluate ideas, initiatives, and values together long before a formal proposal is submitted to a vote of the members (similar to Ethereum Improvement Proposals (EIPs)). As such all DAO members are recognized as managing members of the Limited Liability Company ("LLC") and will have full economic, informational, and governance rights in the LLC.

⁴¹ <https://medium.com/daostack/holographic-consensus-part-1-116a73ba1e1c>

⁴² Shapeero, 'p3terpan', Soleimani (2019) 'MetaCartel Ventures' White Paper. - <https://github.com/metacartel/MCV/blob/master/Whitepaper.pdf>

Voter Participation

In the real world, political elections are one of the few opportunities for all individuals to participate. However, voter participation is low as people feel disenfranchised and left out of the system. Some countries have compulsory voting with penalties for nonparticipation, as opposed to incentives, such as Australia.

What can be learned and adapted to DAOs from research on compulsory voting vs voluntary voting from the political systems? A dissertation presented at Harvard on Five Studies on the Causes and Consequences of Voter Turnout provides some examples of the impacts of compulsory vs voluntary voting from the political systems.

“By collecting and comparing two novel data sources to assess the extent of turnout inequality in Australia before compulsory voting. Overwhelmingly, wealthy citizens voted more than their working-class counterparts. Next, exploiting the differential adoption of compulsory voting across states, they found that the policy increased voter turnout by 24 percentage points which in turn increased the vote shares and seat shares of the Labor Party by 7 to 10 percentage points. Finally, comparing OECD countries, they found that Australia’s adoption of compulsory voting significantly increased turnout and pension spending at the national level. Results suggest that democracies with voluntary voting do not represent the preferences of all citizens. Instead, increased voter turnout can dramatically alter election outcomes and resulting public policies”

One of the challenges for DAOs as their scale is ensuring that they enable, incentivize and/or penalize participants to vote, whilst ensuring that they can operate structurally in the event of low voter participation.⁴⁴

Growing Pains To DAO Size

If a DAO becomes too big will they stop working effectively and will members begin to quit if they feel their voices and votes don’t matter? According to Dunbar’s Rule and the Ringelmann Effect, this is a real concern. It is a phenomenon found in many nations where voter apathy or differences of opinion between different regions cause people to feel unrepresented within the whole.⁴⁵

⁴⁴ "Five Studies on the Causes and Consequences of Voter Turnout"

https://dash.harvard.edu/bitstream/handle/1/11156810/Fowler_gsas.harvard_0084L_10773.pdf?sequence=3

⁴⁵ Ringelmann Effect: Members of a group become lazier as the size of their group increases. Based on the assumption that “someone else is probably taking care of that.”

Nassim Taleb talks about this in his book 'Anti-Fragile' when talking about Switzerland and its cantons:

“Governs them is entirely bottom-up, municipal of sorts, regional entities called cantons, near-sovereign mini-states united in a confederation. Bottom-up variations—or noise—is the type of political volatility that takes place within a municipality, the petty fights and frictions in the running of regular affairs. It is not scalable (or what is called invariant under scale transformation): in other words, if you increase the size, say, multiply the number of people in a community by a hundred, you will have markedly different dynamics. A large state does not behave at all like a gigantic municipality, much as a baby human does not resemble a smaller adult. The difference is qualitative: the increase in the number of persons in a given community alters the quality of the relationship between parties.”

Taleb then goes on to say:

“Take for now that the small (in the aggregate, that is, a collection of small units) is more antifragile than the large—in fact the large is doomed to breaking, a mathematical property we will explain later, that, sadly, seems universal as it applies to large corporations, very large mammals, and large administrations. There is another issue with the abstract state, a psychological one. We humans scorn what is not concrete.”

The size and success of DAO as it scales will depend on many factors:

- The scope of what's decided on by participants
- Track record/history of governance
- How well it can coordinate decision making by members
- Effectiveness of the processes enabling the DAO

Is Dunbar's Number Applicable To DAOs?

British anthropologist, Robin Dunbar, developed what is referred to as the Rule of 150, aka Dunbar's Rule. Dunbar's number is a suggested cognitive limit to the number of people with whom one can maintain stable social relationships or social purpose, and the benefits and consequences of these relationships. Dunbar proposed that on average people have 5 intimate friends, 15 best friends, 50 good friends, 150 friends, 500 acquaintances, and 1,500 people humans can recognize on sight.

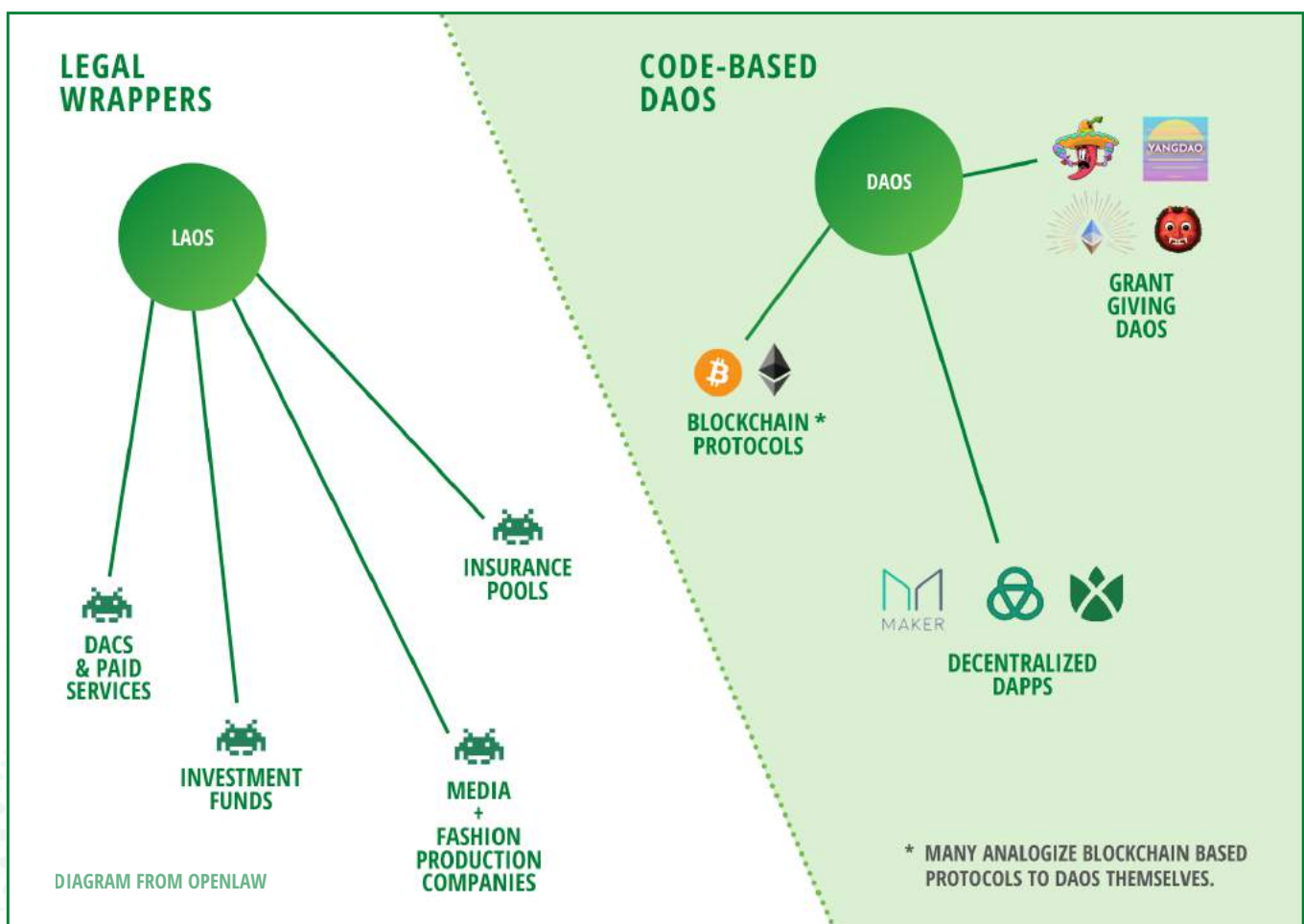
According to Dunbar and many researchers, this rule of 150 remains true for early hunter-gatherer societies as well as a surprising array of modern groupings in social and working environments including offices, communes, factories, residential campsites, military organizations, 11th Century English villages.

Currently, most DAOs operate with less than 150 members, which according to Dunbar's number falls within the framework of friends. As such, a shared vision and common goal is more easily conveyed and worked towards. The challenge moving forward is scaling beyond 500 members, Dunbar's quota for acquaintances, where true decentralization enables anyone to join or unjoin a DAO without the same level of social connection and social contract that DAO benefits from with smaller numbers.

DAOs AND CORPORATIONS

In the US, DAOs can also adopt legal frameworks of an LLC, a Limited Liability Company, which enables them to operate with the same legal protections of registered corporations for both themselves and their members. One example is the LAO, a for-profit US legally compliant venture capital fund that is organized as a DAO. The LAO is being launched by OpenLaw, which is a blockchain protocol that is mapping real-world legal contracts with smart contracts in order to bridge them into the digital, Ethereum ecosystem. This forms a legal wrapper⁴⁶ for projects like DAOs.

“Like The DAO, The LAO allows Members to pool capital, invest in projects, and share in any proceeds from the investment. The LAO is organized as a legal entity (a Delaware limited liability company) primarily administered via an online application (a "DApp") and related smart contracts. The LAO will enable its members to vote on project funding proposals and invest in early-stage Ethereum ventures. Unless modified by the members, funding will be provided to projects in stablecoin or Dai.”



⁴⁶ A legal wrapper gives DAOs legal templates/proformas that they can use as part of their structure to abide by particular regulatory constructs.

It is important to acknowledge that the DAOs philosophy around decentralized governance is not new. There are many examples throughout history, such as Guilds, Cooperatives, and Credit Unions. One of the better known recent examples is Wikis, with Wikipedia being the largest and most popular wiki to date. Wikipedia is a multilingual online encyclopedia created and maintained as an open collaboration project by a community of volunteer editors using a wiki-based editing system. It is owned and supported by the Wikimedia Foundation, a non-profit organization funded primarily through donations.

The Green Bay Packers is another example. A franchise of the National Football League they are also a publicly held non-profit corporation. They are owned by their fans with a cap to limit how many shares any one person can own to remove the ability for one person to gain influence or control over the team.

Their community-owned values can be seen at their home field being sold out for two decades and some of the teams' fan-owners volunteering work concessions at these games and donating part of the proceeds to community charities.

DAO-based corporate architecture isn't only being used by cryptocurrency-based platforms. Many companies are looking to use the benefits of a DAO structure to streamline and improve their businesses. As corporations look to more shareholder-friendly models, DAO governance models are being tested and adopted.

- Robin Hood Asset Management Cooperative is a registered cooperative in Finland that operates under EU regulation and Finnish law. As a cooperative, the individuals that become members determine how the co-op is run. Each member has one equal vote. The co-op invests in Wall Street stock exchange and crypto markets and a part of the profit generated by the fund is invested into projects building the commons. Members decide which common projects get funded.⁴⁷
- UK-based Nexus Mutual is a decentralized mutual insurance provider, which is incorporated as a cooperative and driven by a DAO. They have started by issuing policies that insure smart contracts, but the project aims to expand their offering to insure other types of risks which are typically covered by traditional insurance companies.⁴⁸
- Estonia has been dubbed the Digital Republic. The nation is virtual, borderless, blockchained, and secure. They were the first country to offer e-Residency, a government-issued digital identity, and status that provides access to Estonia's transparent digital business environment. A recently launched EstoniaDAO aims to connect 60k+ Estonian e-residents to a decentralized organisation, with the aim of setting the foundations for new models of ownership and governance.⁴⁹
- In France, La Suite du Monde provides land, financial and legal support to 'imagined communes' that are local, resilient, independent, self-organized cooperatives and plans to use DAOs to manage their funds and initiatives.⁵⁰

⁴⁷ Robin Hood Cooperative - <https://www.robinhoodcoop.org>

⁴⁸ Nexus Mutual - <https://www.nexusmutual.com.au>

⁴⁹ Estonia DAO - <https://estoniadao.org>

⁵⁰ La Suite du Monde - <https://www.lasuitedumonde.com>

It is unlikely that existing corporations would look to adopt DAOs into their existing governance as it opposes and threatens their current centralized controls and organizational structures. However, there is a case to be made that adopting DAOs for some existing processes (e.g. shareholder/proxy voting) would enable more efficient governance of centralized entities. One area where existing corporations may experiment with DAOs could be through their charitable foundations, as they have their own structure and model and don't threaten or add risk to corporations' existing centralized models. In this example, a corporation's charitable arm could adopt a DAO structure to enable all stakeholders, be they employees, shareholders, members, etc, to have a voice in the quantity and deployment of funds, the process of application, the approval of grants, and full transparency of all stages through this process.

FINAL THOUGHTS AND CONCLUSIONS

1. There has been an explosion of DAOs in the last year and that trend should continue. The reason for this is DAOs introduce a greater degree of transparency combined with the trust layers of blockchain into an organization's corporate structure. As a result of this, expect to see more protocols built for expressing and programming organizations and their governances.
2. DAOs need to have a community-first approach - it is very difficult to start a DAO without a shared vision and a strong sense of community.
3. DAOs can turn open source-projects into for profit organizations, simultaneously bringing the best of decentralization and governance.
4. DAOs are organizations built on top of a protocol layer (mainly Ethereum right now). The internet of value includes money (DeFi) but also an organization's equity (DAO)
5. DAOs will enable individuals to invest in projects at their earliest stages, even before the "smart" money. VC's and institutional investors will not be able to lead here.
6. DAO's have multiple off-chain operational requirements that rely on human action, such as team communication, governance, arbitration, contracting, management function or board. All off-chain functions require a level of accountability to ensure what is said will be done, when it needs to be done, and at a quality expected. As in any business, it is important to design good governance and communication tools so that member expectations are being fulfilled.
7. Exploits are part of the adaptive development of a network especially networks that contain economic and financial value built using novel technology. If the system is sufficiently robust, it will respond, become stronger and move forward. The main point is that exploits will happen regardless of the goodwill of the participants so the network needs to be robust enough to be able to overcome unethical actors - particularly if the ruleset is in the software (smart contracts).
8. For-Profit DAOs will grow bigger over the next few years and may begin to accumulate large amounts of capital to deploy back into the crypto ecosystem. This will be powered by DeFi.
9. DAO decentralization is relative to the mission and purpose of each DAO. This is reflected in their onboarding process for members. Some DAOs, like RocketDAO, have an automated onboarding process that is open to everyone. It does not require an invitation, vetting process, or staking to join. This approach will enable them to scale and decentralize faster than DAOs that have chosen a process of invitation-only and high staking and also intentionally capped numbers for their current stage of development, such as a LAO.

10. At the legal level, DAOs have been exploring legal structures (LLC) as a means of both operating within legislative requirements, as well as providing some legal protection to the DAO and their members. What is still unclear is if legislation will look beyond the DAO and create obligations for individual members. This could be for a variety of reasons from taxation through to membership in DAOs that participate in activities that may be deemed potentially illegal.
11. Web 2.0 Era VCs and even a mass majority of crypto VCs will all completely miss out on many crypto-native opportunities to invest in projects because the investment process is different than anything before it. Since VCs won't be able to fund many of these projects, communities will step up in their place. There is no better investor than those who believe in projects and incentives are aligned.⁵¹
12. Investing in DAOs allows "normal" individuals to invest both their money and time (work) into projects in a way that hasn't been possible until now. Community and contributors grow the company through the community before ever seeking outside capital.
13. As blockchain and subsequent technologies continue to evolve, whole new business models, enterprises and new economies will be created for future needs that haven't been identified yet and with it, an opportunity for decentralized organizations to be created from the outside in, not the inside out.
14. It's still early days and exponential growth, adaption and adoption will be the result of current DAOs real-world use cases delivering on the promise of DAOs governance and member voice participation.

⁵¹ Inspired from [@pet3rpan](#)

APPENDIX

DAO ECOSYSTEM

The descriptions below have been provided by the respective team members directly.

Our intention is to provide the opportunity for readers to quickly understand the DAO landscape with links to each project to help you do your own research.

Please note that this not a definitive list and the ecosystem of DAOs continues to grow.



Akropolis



Akropolis is an upgradeable framework for creating for-profit DAOs. The first product comprises (a) liquidity and incentive management using bonding curve, (b) capital coordination mechanism for under-collateralized credit, (c) yield rebalancer. Thus, it aims to translate new DeFi developments into the original vision for a provably solvent pension fund, independent of the banking system, and resilient to inflation and a wide range of attack vectors.



Aragon



Aragon is a software application for creating and governing organizations, such as companies, nonprofits, clubs, and communities. Organizations can use Aragon to define and enforce their governance rules and collectively manage shared resources such as money, contracts, and other blockchain-based assets.



Aragon Network



Aragon Network is an organization that provides infrastructure and services to organizations, and is governed by [Aragon Network Token \(ANT\)](#) holders. The first service provided by the Aragon Network is [Aragon Court](#), a dispute resolution protocol.



Arbitrage DAO



Arbitrage DAO is a DeFi Union Arbitrage Fund built by Stake Capital team. It uses a combination of on-chain liquidity and off-chain bots designed for arbitrage opportunities



Arweave ARCA DAO



Arweave is a protocol that enables economically sustainable permanent information storage. By offering a new form of storage, backed by an endowment, Arweave enables users to persist web pages, web apps, and all other types of documents, forever. The ARCA DAO funds people like you to pursue your vision for applications, integrations, and beyond with the Arweave protocol.



Bancor



Bancor is a defi protocol, we are creating a DAO to give participants in the bancor ecosystem control over the protocol. The first vote will be on the staking rewards model sometime during 2020.



Bisq



Bisq is a peer-to-peer bitcoin marketplace powered by free/libre software. Maintaining utmost privacy, security, and freedom is a top priority for users, and for the project itself—the project's decentralized autonomous organization model allows it to operate sustainably without ties to any jurisdiction, legal structure, or funding mechanism.



Bitfwd



Bitfwd is a grassroots community of cypherpunks, Blockchain developers, entrepreneurs, and crypto enthusiasts, who bring together resources, content and educational activities. Bitfwd makes Blockchain accessible to everyone.



BlockRocket



BlockRocket is a Web 3.0 focused engineering and product delivery team which builds products using emerging decentralised and web 3.0 technologies, our most well known project is KnownOrigin.io. We have been involved in a few DAOs over the last 18 such as the MetaCartel and RaidGuild.



bZx



The bZx protocol is a financial primitive for shorting, leverage, borrowing, and lending that empowers decentralized, efficient, and rent-free blockchain applications.



CarbonDAO



The CarbonDAO is a mechanism for the distributed evaluation of carbon credit projects, informing their funding, and finally managing the carbon credits generated by the projects.



CO2ken



CO2ken has launched a Carbon DAO with the objective to kickstart an open and DEcentralized Carbon Accounting ecosystem on Ethereum—we call it DeCA. By turning carbon credits into fungible tokens we hope to bring transparency & trust to carbon markets.



Colony



Colony is a platform for community collaboration: Do work, make decisions, and manage money, together.



The Commons Stack



The Commons Stack is building commons-based microeconomies to sustain public goods through incentive alignment, continuous funding and community governance. Their library of open-source, interoperable web3 components will put effective new tools in the hands of communities, enabling them to raise and allocate shared funds, make transparent decisions, and monitor their progress in supporting the Commons



Cone



Cone brings free-market economic principles inside of firms, enabling companies to function more like a city than a traditional company. By allowing teams within an organization to operate as semi-independent startups, firms can become more modular, innovative, resilient, and scalable



CuraDAO



CuraDAO leverages emerging technology to empower a community of do-ers and thinkers with tools to collectively manage financial and non-financial resources. By improving trust, CuraDAO removes barriers for collaboration and participation. An ecosystem where anybody can contribute to the common goals of the community and receive a fair reward in return.



Curve Labs



Curve Labs is a team of design and developer interventionists architecting distributed solutions for the future economy. We tackle systemic challenges of the Anthropocene by creating, combining, and integrating modular open-source technologies to form decentralized organizations more than the sum of their parts.



DAO Osaka



DAO Osaka is a small for-profit Arts DAO which commissioned artists to create NFT artworks that were subsequently sold, the goal being to prove that DAOs can be profit seeking.



DAObase



DAObase is the leading source of knowledge about DAOs and the OrgTech powering them.



Daohaus



Discover and join existing DAOs. Or summon your own.



DAOstack



DAOstack is building Collaborative Networks - DAOstack is an open source project advancing the technology and adoption of decentralized governance. Most popular DAOstack DAOs portal: Alchemy.daostack.io

Dash



Dash is digital cash that provides financial freedom to everyone by offering a completely decentralized payment system. Transactions are instant, secure, easy, and with near-zero fees.

Decred



Decred is a digital currency, decentralized credits. It is community-directed, with stakeholders voting to govern their network, and their consensus is that it should aim to be a superior store of value.



Decentraland DAO



Setting up a DAO to decentralize policy, assets, and infrastructure; and a foundation to further Decentraland's mission.



DEPO DAO



DEPO DAO is a decentralized community focused on funding and supporting the next generation of open-source political technology builders

DeversiFi



DeversiFi gives traders an edge in popular crypto markets by allowing them to trade with lightning speed and deep aggregated liquidity directly from their privately owned cryptocurrency wallet. Users can take advantage of more trading opportunities while always preserving control of their assets for when they need to move fast.

district0x



district0x is a connected network of user governed marketplaces, with all the governance features in place to allow third party expansion of the network.



DMM



DeFi Money Market (DMM) is an ecosystem built on the Ethereum blockchain that bridges interest-generating real world assets into the Decentralized Finance (DeFi) ecosystem in a transparent, trust-minimized, overcollateralized, and permissionless manner.



dOrg



dOrg is a full-stack freelancer agency that builds and self-governs with web3 technology, including dApps, DAOs and DeFi.



DXdao



DXdao develops, governs, and grows DeFi protocols and products. Owned and operated by the community, the DXdao, built on the DAOstack framework, has over 400 member addresses and the potential to significantly scale its membership.



Ethereum



Ethereum is a global, open-source platform for decentralized applications.

• • • • • ECONOMIC
• • • • • S P A C E
• • • • • A G E N C Y

Economic Space Agency



Economic Space Agency is a 21st century economic technology company. It is building peer-to-peer economic networking protocols which are open and free to use, give everyone equal capacities of economic expression, and can make the value of intangible, informational and relational recognizable and economically expressible. They call it the post-capitalist economic media.



Galt Project



Galt Project is property tokenisation and self-governance protocol on Ethereum mainnet and xDai sidechain. Property owners can tokenise their property (apartments, houses or land plots) as unique ER721 tokens and unite in "Community of Homeowners" DAO's. Each DAO can be as small as an apartment house, or several neighbouring houses, or in theory as big as a whole city or region.



Genesis DAO



Genesis DAO is a grant-giving organization run by the DAOstack community. Through 2018-19, the DAO was funded by DAOstack to transparently support efforts to grow the open-source DAOstack ecosystem.



H O L O C H A I N

HoloChain



All HoloChain dApps function as a DAO. Peers mutually enforce state changes per the dApp's coded rules. Because this is done via validation instead of global consensus, there are no limits to TPS or scale.

Kava



K L E R O S

Kava

DeversiFi



Kava is a cross-chain DeFi lending platform offering stablecoin loans to users of major cryptocurrencies. Kava's platform is controlled collectively by Kava stakers which vote on-chain to control the system's parameters such as interest rates, debt ratios, and collateral types accepted. As a DAO, Kava holders can vote on system changes, upgrades, and enable parameter changes via on-chain governance votes.

Kleros

DeversiFi



Kleros is a system of decentralized courts, creating open source online dispute resolution. Kleros uses advanced game theoretical incentives to utilize the power of the crowds to analyze and rule on cases correctly. It acts as a decentralized third party capable of efficiently providing decisions to questions ranging from simple to highly complex



kyber network

Kyber Network

DeversiFi



Kyber Network is an on-chain liquidity protocol that aggregates liquidity from a wide range of reserves, powering instant and secure token exchange in any decentralized application. Kyber is the most used liquidity protocol in DeFi, with the most number of integrations and users, and almost US\$1Billion worth of trades facilitated since its launch. The protocol is open source and governed by the KyberDAO, a decentralized community of Kyber Network Crystal (KNC) token holders who stake their tokens and collectively vote on key protocol parameters. KyberSwap.com is a non-custodial token swap platform and one of the 100+ DApps built using Kyber's protocol.

The LAO

DeversiFi



The LAO is being organized in the spirit of The DAO, as a member-directed venture capital fund organized in the United States, with an aim to be compliant with U.S. law. Like The DAO, The LAO allows Members to pool capital, invest in projects, and share in any proceeds from the investment. The LAO is organized as a legal entity (a Delaware limited liability company) primarily administered via an online application (a "DApp") and related smart contracts.



LexDAO



LexDAO is a group of legal engineers, lawyers, and blockchain enthusiasts, building smart contracts and other tools for smart legal agreements and online dispute resolution. The community is also working on creating inclusive standards and certifications for Legal Engineering.



Machi X

DeversiFi



Machi X is a collective of artists and patrons, curating and trading digital art. The Machi X DAO is a member-directed organization where members pool resources, create proposals to improve Machi X, and approve governance changes for the Machi X ecosystem.



MakerDAO

DeversiFi



MakerDAO enables the generation of Dai, the world's first unbiased currency and leading decentralized stablecoin. Dai eliminates volatility through an autonomous system of smart contracts called the Maker Protocol, as well as through decentralized community governance.

The Maker Ecosystem Growth Foundation is tasked with bootstrapping MakerDAO to fuel growth and drive the organization toward complete decentralization. The Foundation provided development support through the launch of Multi-Collateral Dai (MCD) and is currently spearheading efforts to decentralize development.



MarketingDAO



DAOs let us build software ladders. Anyone can acquire reputation and achievements. It's a more scalable, trustworthy and fair way of running organizations



Melon Protocol



Melon was completely decentralised last year and handed over to a DAO which runs on Aragon. Melon is building a DAO module which is almost ready which will mean that for-profit DAO's can manage a Melon fund with all the benefits that come with that.



MetaCartel



The MetaCartel Ecosystem is the home of DAO summoners.



Meter



Meter is a programmable money infrastructure with a unique economic and consensus design. It leverages proof of work mining algorithm to create a low volatility global currency and state of the art proof of stake consensus to safeguard the payment system. The Meter Governance Token (MTRG) used to qualify as a validator for maintaining the network, and to gather proposals and votes for major changes to the protocol.



Moloch DAO



Moloch DAO awards grants to advance the Ethereum ecosystem.



Nexus Mutual



Nexus Mutual is a people-powered alternative to insurance where members share risk together. It's initial product covers members against Smart Contract failure.



OpenLaw



OpenLaw is building a technology stack to help power next generation "smart" legal agreements. The OpenLaw protocol documentation is intended to provide a resource for developers to build around our open source language and integration APIs



OracleDAO



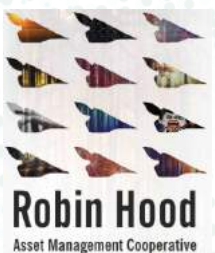
OracleDAO is a smart contract aimed at coordinating efforts to fund marketing, research, and engineering related to the Augur project. OracleDAO focuses on positive externality projects to improve value for REP holders and users of Augur.



Pocket Network



Pocket Network is a decentralized infrastructure protocol that provides developers with trustless access to the full API for any blockchain client through a global, distributed network of node operators.



Robin Hood Cooperative



The Robin Hood Cooperative is an investment fund and a platform for the crypto finance of the commons, a new kind of democratically governed and decentralized financial cooperation tool, a community for risking and speculating together, prototyping new financial instruments, also offering a legally compliant service to have exposure to the crypto markets.



Stake DAO



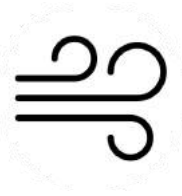
Stake DAO distributes value generated by a basket of DeFi services to stakeholders. The DAO functions as a cooperative, whereby stakeholders earn SCT tokens for providing collateral and, via a staking mechanism, receive a share of the fee revenues generated by supported DeFi services. The Stake DAO token effectively encapsulates the intrinsic value of the DeFi services basket. The Stake DAO token also grants pro-rata governance rights over all operation concerns of the DeFi services' provision. Staking derivatives are also enabled via locked pools on top of the supported DeFi protocols.



StakerDAO



StakerDAO is a community of investors that builds and manages products for decentralized finance. We are focusing on on-chain governance, cross-chain synthetics, and tokenizing real world assets.



SwiftDao



Investment club daos for honest blockchain projects with a focus on fraud resistance, social investing, capital growth, and reduced overhead.



Synthetix



Synthetix is a decentralised synthetic asset issuance protocol built on Ethereum. These synthetic assets are collateralized by the Synthetix Network Token (SNX) which when locked in the contract enables the issuance of synthetic assets (Synths). This pooled collateral model enables users to perform conversions between Synths directly with the smart contract, avoiding the need for counterparties. This mechanism solves the liquidity and slippage issues experienced by DEX's.



Trojan DAO



The Trojan DAO is a decentralized art. collective based in Athens. Today, art. is controlled and commissioned by the wealthy. Trojan DAO aims to change this paradigm, giving curation power to the artists themselves.



Vocdoni



Vocdoni is building a privacy-centric governance platform using digital voting with maximum guarantees of anonymity (thanks to zk-SNARKs), and a set of tools to manage the relationship of organizations and its members.

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