Platform Whitepaper

DAOBAY

decentralized e-government platform

by David N. Jones

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A Letter From The Founder

My name is David N. Jones, I am a technologist, inventor and founder of Lumena Energy. I am a graduate of the Massachusetts Institute of Technology (**MIT**) and a Software Engineer with a minor in Electrical Engineering. We launched in 2019 at the **Google Headquarters** in Chicago, IL. We are a cleantech enabler that focuses on constructing virtual power plants. We most recently encountered a bottleneck in the sociopolitical layer of our business. One of the biggest barriers to entry we face is that every market we enter has its own subset of legislation, regulatory hurdles, and social dilemmas to address.

Subsequently, this compiled an endless list of queries such as:

· *How will communities cooperate with other communities?*

· *How to liaise with local governments for fluctuating price indexes*

· *What to do when the local legislature changes?*

Ultimately, this bottleneck was distilled down into a single question: **How can we engineer an autonomous democracy?**

This led us inexorably toward the development of the ***REDAO*** or Renewable Energy Decentralized Autonomous Organization, which I'll get into later on.

The sociopolitical climate of energy production is ever changing, and if we were to interfere with every cog in the gear, we would be left dancing an endless waltz. This would also jeopardize the autonomy of our virtual power plant framework. We would eventually revert to a centralized system—that's a bad thing.

Fortunately, our predicament was met with the creation of the DAO. Thus, helping us to architect a living breathing solution. The reason for this whitepaper is to share some of our domain expertise in the hopes that it will accelerate the adoption of the DAO. *cont.*

This is how **DAOBay**--an open-source DAO operating system was born.

We then realized that it would kill two metaphorical birds with one stone by building a **DAO operating system** (***DAO OS***)

1. **Provide an open-source platform for our clients to create their own REDAO**
2. **Provide a way for anyone to build their own DAO quickly and without needing coding skills.**

I personally believe decentralization is the future, and it will manifest itself in every facet of human interaction. Wherever there is an intersection of decision making and a large concentration of people, there will be a need for the DAO.

Please join us as we share our combined progress on **DAOBay.**

The DAOBay Team

Executive Summary

DAOBay is a **DAO Operating System**. The straightforward UI walks the user through a multi-part tutorial. Our fully Web3 native Decentralized App (***Dapp)*** first integrates the users crypto wallet, then integrates an Ethereum-based blockchain, and finally renders hard-coded Operating Documents via a template.

This gives the UI three distinct layers:

1.Initial setup of identifiers and proxies

2.Rules and Dispute Resolution Client

3. Hard-coded Operating Documents

Once completed, **DAOBay's** intuitive prompt creates a democratically-governed infrastructure of DeFi portfolios driven and optimized by SingularityNET's AI.

The **Distributed ledger technology** can **automatically** enable basic features such as:

· Batch payouts for salaries, grants, and bounties
· Automate trustless reporting leveraging **IPFS** decentralized storage
· Integration with **Gnosis**, **Aragon,** and other leading DAO frameworks.

Create immutable smart contracts that require **Proof-of-Stake** (*PoS*), optional extra layer of security by requiring government issued ID to avoid multiple accounts.

The issuance of a finite amount of governance tokens results in a **Coin-weighted** delegation. A DAO has its own native tokens, and whoever holds the tokens is a member of the DAO.

These tokens can be used for trading, if a user wants to leave the DAO, they may simply trade it to a friend. Or if a user chooses to stay in the DAO, it can be used for crucial decision-making.

Intro

What Is A DAO?

Like many newbies, you're probably unfamiliar with the term **DAO.** It stands for Decentralized Autonomous Organization, in layman's terms it's a **Digital organization with pre-agreed upon rules that aim for collective management and is not influenced by a central government**.

With the advent of decentralized **smart contracts** this will usher in an age where no one human being gets to decide for everyone else. There is no central leadership, it's globally accessible, non-hierarchical, and interoperable. Governance is shared by all members. Think of a DAO like **"A chatroom with a shared bank account".** Due to its pure democratic hyper-rational nature, there are more possibilities than knowns. We should approach DAOs as the new frontier that it is, there are more benefits than drawbacks.
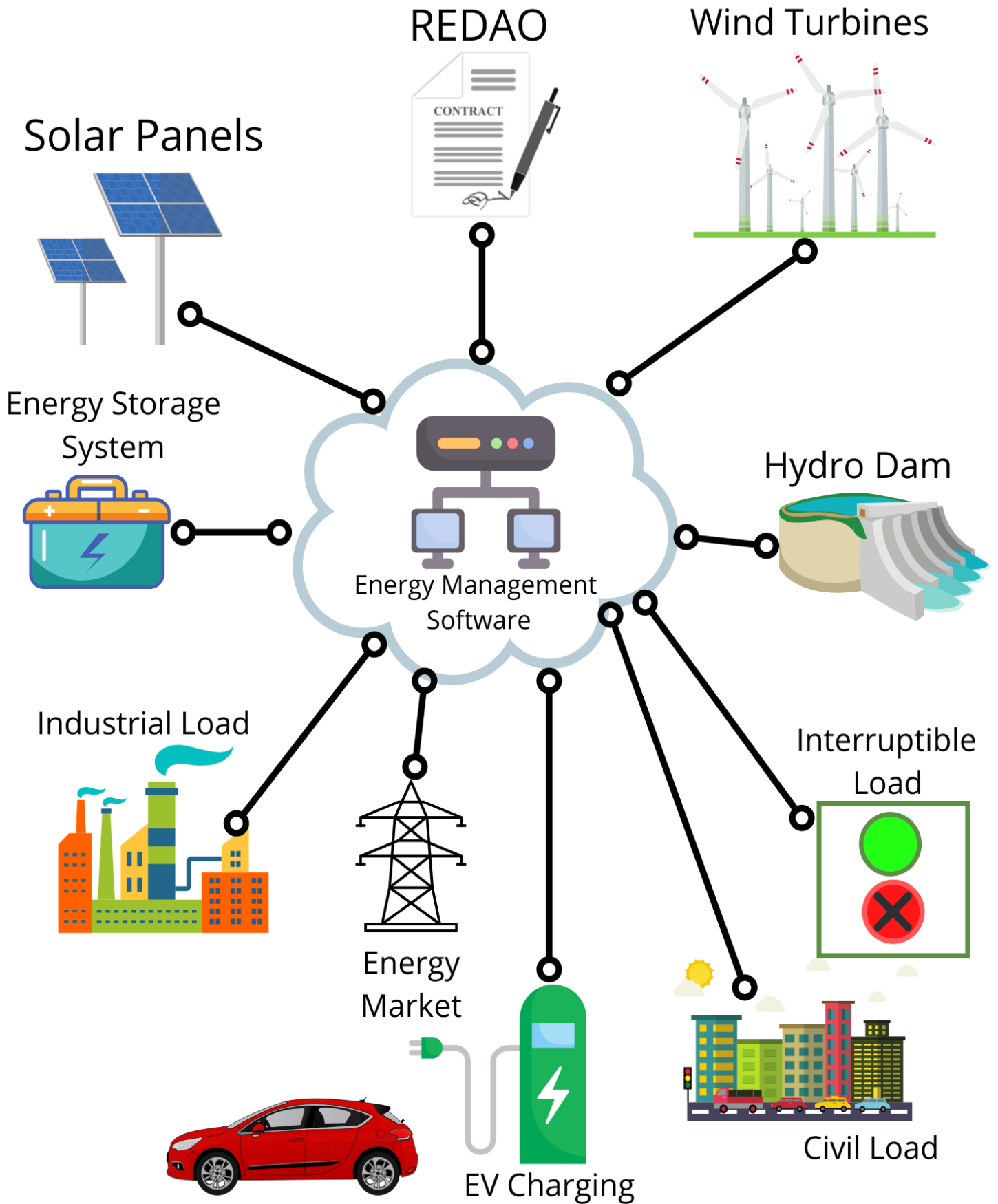
- Verifiable
- Trustless
- Self-governing
- Permissionless
- Distributed and robust
- Stateful
- Native built-in payments

What are we solving?

Closed door decision-making has been the decided model for traditional enterprises and practically every other form of government for thousands of years. While it has its benefits, it has left the majority in the dark. The DAO greatly reduces the risk of corruption and censorship.

The DAO seeks to create boundaryless governance, a space where a person's economic class, race, religion, creed etc. holds no bearing on their ability to propose and help to shape the future of the interest they're vested in.

VPP Framework

Solar Panels

REDAO

Wind Turbines

Energy Storage System

Energy Management Software

Hydro Dam

Industrial Load

Interruptible Load

Energy Market

EV Charging

Civil Load

Birth of the REDAO

The heterogenous framework of the decentralized energy ecosystem, namely the **Virtual Power Plant** has shifted and evolved since its inception, and it will continue to evolve. However, the current Virtual Power Plant model is composed of 5 critical layers:

1. Hardware (Solar panels, Inverter, etc.)
2. Software (Energy management system)
3. IoT framework
4. Battery storage
5. REDAO

The REDAO serves as the social layer of a **Distributed Energy Resource**. When disparate energy assets are required to communicate among themselves, with foreign entities as well as consumers, things can get rather muddled. To boot, politics and legal red tape dictate the constantly changing landscape thus further complicating the execution of a **Virtual Power Plant**, this is where the REDAO demonstrates utility.

If we take for example the island nation of The Dominican Republic, which happens to be an ideal location for a Virtual Power Plant network; due to its above average annual sunshine, struggling socioeconomic environment and its below standard national energy grid. This constitutes a real-world application for the methodology. The system falls short because currently none of the technology or the disparate entities communicate with one another.

The REDAO would establish a trustless, self-governing token-based blockchain in which **VPP node owners** would be able to sell their Solar Renewable Energy Credits (**SRECs)** or similar on-chain to the open market at prevailing market prices.

The federal and local government would define tariffs, index pricing structure and domestic regulation within the smart contract.

Here's how a consumer use case scenario would look:

Model 1 Figure 1.2

1. VPP node owner has system installed on property
2. Node owner downloads EMS app and agrees to Terms & Conditions
3. Node owner executes energy blockchain trade
4. Node owner receives crypto token as payment
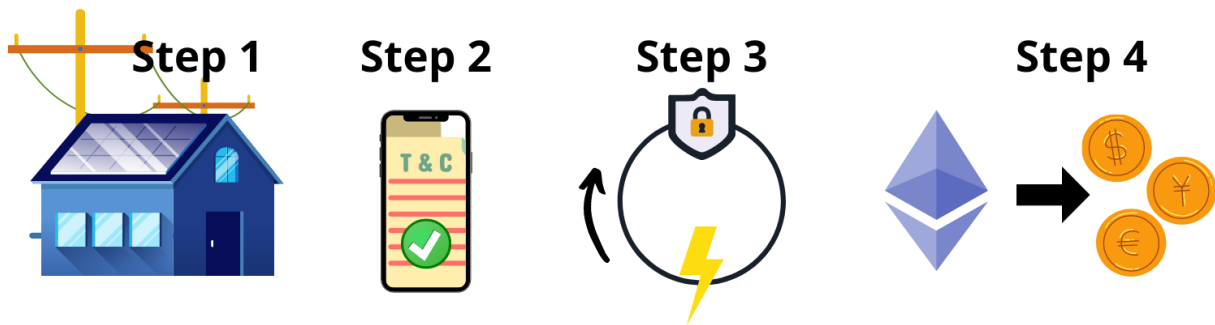
Model 2 Figure 1.3

1. A hurricane strikes a portion of the island causing rolling blackouts
2. VPP node owners on the network use the DAO to conduct on-chain e-referendum
3. Token holders vote to give permission for AI to distribute energy where it is needed most
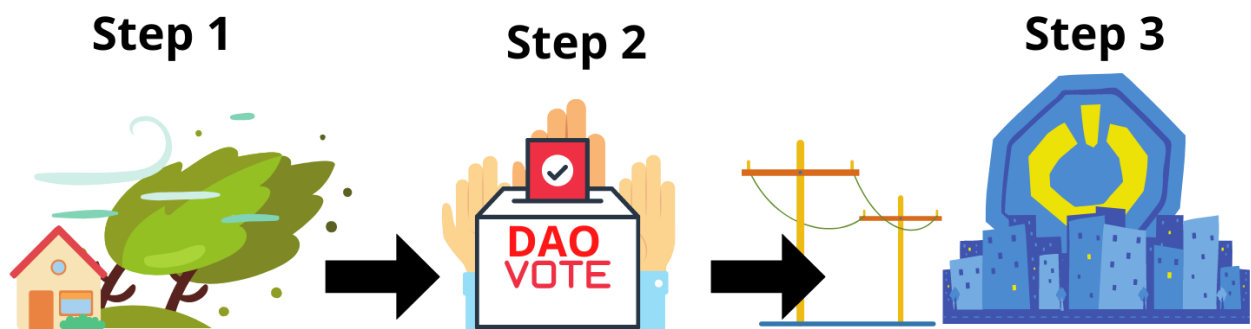
DAO Use Cases

DAO models can take on many different forms, they're not binary and they're not static. The concept is fairly new, society is currently in the fact-finding stage. Time will tell how users will develop user applications and real-world scenarios. Due to its amorphous nature, it's up to the founders to fit the mandate and the objectives into the DAO.

Quick mobilization around a cause removes slow crawling bureaucracy and potentially saves lives. The philosophy of the DAO remains mission-driven. We're moving toward entities that are born on the internet, live on the internet and stay on the internet. But there will be a physical likeness or a shadow structure that is used to process clerical duties such as shipping of items and overhead expenses. Below are a list of practical use cases:

Charity causes- How frequently to send aid to their recipients can create initiatives to seed a project in a matter of hours or days, instead of relying on clunky larger organizations with numerous moving parts. Having decisions and funds move through the blockchain also means transparency, there are countless cases of larger charities misappropriating funds.

A single natural disaster such as a California wildfire can devastate land, wildlife and cause billions in property damage. A DAO can provide necessary aid where it is needed most.

Financial lending can place NFT's in a smart contract, if borrower defaults ownership is placed in borrower

Real Estate Investment-Funds can quickly be allocated to bootstrap a purchase on real estate properties, bypassing the need for an agent, a bank or practically any middlemen.

DAO Categories

A DAO can be driven by any purpose, the industry is still in its fact-finding stage, at the time of this writing December 2021, these are the viable DAO categories:

1. **DAO Operating Systems**-Offer the resources for people to start their own DAO

2. **Grant DAOs-**Acts as a form of venture capital fund. Communities can donate funds and use a DAO to vote how capital is allocated in the form of governance proposals.

3. **Protocol DAOs-**Give voting power back to communities

4. **Investment DAOs-**Allow members to pool capital and invest in projects at their earliest stages, more legal restrictions than a typical VC fund

5. **Social DAOs-**Friends can become coworkers and interact on a decentralized platform

6. **Service DAOs-**Used to create decentralized working groups for individuals and talent agencies-they help bridge the gap between Talent and Communities.

7. **Collector DAOs-**NFT communities work with artists or platforms

8. **Media DAOs-**Incentivize content creators and consumers and share the open agenda of news

9. **REDAOs-** Virtual Power Plant node owners abide by federal and state energy regulations and collaborate with fellow node owners on the same grid network.

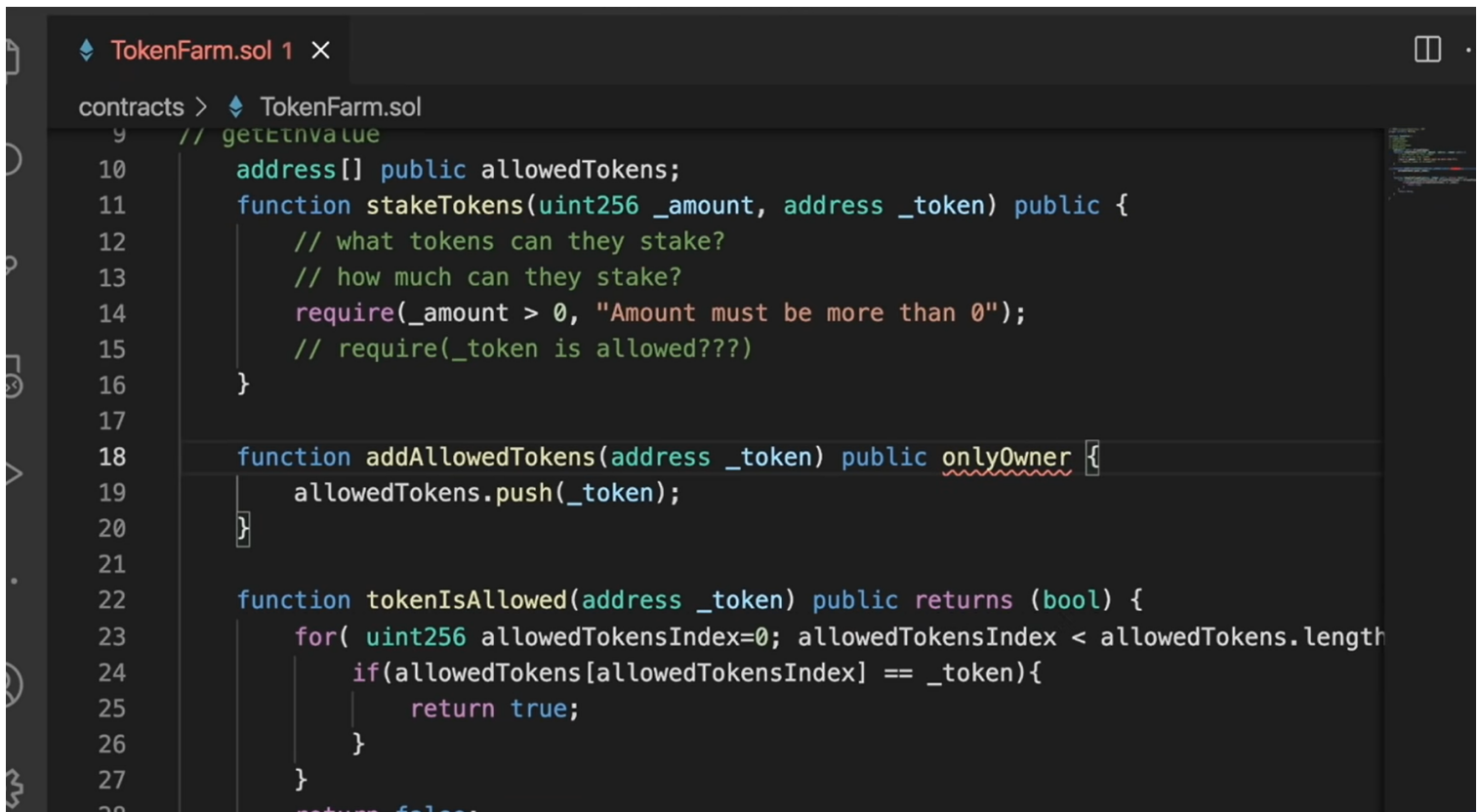**DAO Structure**

Build-Congress-Governance

DAO Tools

Snapshot, which are mainly used to manage the voting proposals of token holders. These tools make it easier for members of the organization to view proposal details and voting status.

How A Smart Contract Works

The contract defines the rules of the organization and holds the group's treasury. Once the contract is live on Ethereum, no one can change the rules except by a vote. If anyone tries to do something that's not covered by the rules and logic in the code, it will fail.The treasury is defined by the smart contract too, that means no one can spend the money without the group's approval either. This means that DAOs don't need a central authority. Instead, the group makes decisions collectively and payments are authorized automatically when votes pass.

Figure 1.4

Sample DAO source code

```solidity
      // getEthValue
10        address[] public allowedTokens;
11        function stakeTokens(uint256 _amount, address _token) public {
12            // what tokens can they stake?
13            // how much can they stake?
14            require(_amount > 0, "Amount must be more than 0");
15            // require(_token is allowed???)
16        }
17
18        function addAllowedTokens(address _token) public onlyOwner {
19            allowedTokens.push(_token);
20        }
21
22        function tokenIsAllowed(address _token) public returns (bool) {
23            for( uint256 allowedTokensIndex=0; allowedTokensIndex < allowedTokens.length
24                if(allowedTokens[allowedTokensIndex] == _token){
25                    return true;
26                }
27            }
28            return false;
```

ethereum
Smart Contract

Voting Structure

Does the founder have to set all the rules and think of every possible scenario? Ideally, yes but there's no limit to the number of scenarios for which you have set the governance. The role as the creator of the DAO would be to set the basic rules of governance at minimum.

The DAO creator needs to think about the potential underlying causes of conflict and then set how those conflicts will be resolved. The structure of voting rights is based on many parameters and therefore varies greatly. Below is a list of preliminary governance rules to consider:

Questions To Address Prior To Creating A DAO:

I.   *What is the objective of your DAO?*

II.   *Who can vote?*

III.   *How many votes do the creators get?*

IV.   *What happens when there is a tie?*

V.   *Will members need to qualify a hurdle to be eligible voting members?*

VI.   *Does every member get to participate?*

VII.   *DAO Duration*

VIII.   *Minimum quorum*

IX.   *Margin of voting*

X.   *Multi-level governance structure*

XI.   *Simple majority voting*

XII.   *Super majority*

XIII.   *Council cycle*

XIV.   *Coin holding*

What makes a DAO safe?

DAOs rules are encoded into a custom smart contract. The objective is to ensure that no human entity is able to control or manipulate the agreed upon rules later on.Transparency-everything on the blockchain is publicly auditable which means you don't have to worry about the obfuscation of data.

Disadvantages of a DAO

Like any new concept, DAOs are not without fault. They are not an end-all solution to every type of organization, and there is still much exploration to be conducted and mistakes to be made. DAOs can use code to replace all aspects of legal contracts and automate virtually every aspect of operating expenses, at its current state many organizations may not be able to obtain certain laws protection. However, it's worth noting that in June 2021 Wyoming officially recognized DAOs as LLCs.

Also, one of the biggest drawbacks is that DAOs are hard-coded. There have been some that failed miserably, a decentralized autonomous organization is only as good as its code. Choosing the right agency to render your DAO is very important.

Like any other business enterprise, the safest bet would be to insure your investment.

Conclusion

We can't expect every person to turn into decision making experts, we have to meet in the middle to have a balanced decision making process. I believe the DAO is the next step in that evolutionary process. We can only continue to experiment, iterate and track the results.

No single person has all the answers, conversely, not every member of society is qualified to ---- but bringing more people into the space for open dialogue paves the way for democratization.

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