Decentralized Autonomous Organization (DAO) – A Review

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Article Information	Abstract
	The idea of DAO development is a novel and radical solution to the constant centralization of power and financial capabilities of the world community. Unlike decentralized finance (DeFi) in general, which uses blockchain to replace trusted third parties in banking, lending, investing, and other financial transactions, DAOs use technology to transfer some or all decision-making power from organizations to individuals using a code for setting guidelines, namely how decisions are made and implemented. Investors place their digital assets in liquidity pools using code-driven smart contracts without the need for an intermediary to ensure that all parties meet their obligations. In exchange for their investment, investors receive a token that allows them to participate in the centralized management of the pool, including the ability to vote to choose which beneficiaries receive a portion of the income that becomes a donation and set parameters for smart contracts. And although this scheme, in addition to advantages, has disadvantages, the idea of DAO continues to develop. At the moment, this development is limited only to the digital environment. Yet, the perspective is impressive.

A. Introduction

On June 17, 2016, about $60 million was stolen by hackers from The DAO. And although it soon ceased to exist, the concept behind The DAO - a decentralized autonomous organization - served as an impetus for new projects in the field of cryptography. The DAO stands for the 'Decentralized Autonomous Organization' (or DAO for short). In such organizations, the functionality, powers, and responsibilities are distributed among the holders of DAO tokens, partly among their employees.

The DAO was initially a fund in which decisions were made not by the board of directors but collectively by all token holders on smart contracts. These are basically parts of code implementing blockchains that do not require trust or confirmation from intermediaries. When some predefined condition is met, the smart contract executes the corresponding clause of the contract (Virovets & Obushnyi, 2021). Due to a vulnerability in the code, hackers stole a large sum from the organization at a time without formally violating the terms of the contracts, as a result of which the question arose of whether to return the money (which was technically feasible but contrary to the very idea of the organization) or admit losses (depriving investors of money). Both scenarios were disastrous, and the fund closed (Virovets & Obushnyi, 2021). But it was closed not because the concept was weak. Some principles greatly distinguished The DAO from other existing organizations:

1. Absolute tolerance towards potential voting participants on the platform (in terms of state, geography, and other parameters);

2. Consideration of any proposals to change the platform with a collective vote.

3. Opportunity to receive profit in crypto coins for realized offers that create value (profit was converted into platform tokens and directed to further development).

Now several projects affect or implement the ideas of the DAO. For example, the private cryptocurrency Dash or tokenized gold in Digix (Wrigth, 2020). There is also a decentralized transport network Backfeed and OS for collective management DAOstack. Finally, the infrastructure project Colony aimed at the digitalization of self-organized companies called colonies (Wrigth, 2020). The voting mechanism is present in the colonies, but it is often unnecessary for small day-to-day operations. At least, the approval of procedures by all colony members is superfluous. There can be several colonies, each modular and customizable, to allow the implementation of systems that differ in functionality, including less distributed and centralized ones.

B.   DAO Overview

At the beginning of 2021, DAO became a hot topic of discussion among representatives of the crypto community. Many blockchain projects quickly announced the presentation of their organizations of this type. Currently, the trend remains immensely popular and continues to develop (Wrigth, 2020).

Unlike a centralized and abstract decentralized but not the autonomous organization, DAO has some fundamental properties due to its structure. Consider a decentralized autonomous corporation (DAC) as an example of a DAO, a subtype

of DAO that is well terminologically described. DAC should have the following properties and characteristics (Diallo et al., 2020):

1. Autonomy - after reaching a certain critical mass in terms of a set of parameters, the DAO should be able to function independently of the creators.

2. Distributed - DAO should not have central nodes vulnerable to attacks.

3. Transparency - all transactions and the rules by which they are carried out must be available and known to all participants.

4. Confidentiality - customer information must be cryptographically protected.

5. Trust - there are no activities within the DAO that require "trust".

6. Guarantee - functioning is carried out solely in the interests of customers and token holders.

7. Self-management - automatic execution of the embedded algorithms.

8. Resistance to corruption – corruption in the classical sense is impossible.

9. Sovereignty – the right to own resources.

Setting up an organization is simple in terms of scale, saving the money, time, and paperwork required to incorporate organizations or companies formally (Nielsen, 2019). At least for now, this may change later, and regulated registrations will be required. But the legality of its work is a problem since the idea of a decentralized format presupposes operation around the globe, making it difficult to comply with all the rules simultaneously in all countries without exception (Nielsen, 2019). Thus, only three locations have the opportunity to register a DAO, namely Wyoming (USA), the Marshall Islands (Republic of the Marshall Islands) (Datta, 2021), and the city of Zug (Switzerland) (Zalan, 2018). However, just the example of the town of Zug is beginning to spread throughout Switzerland (Zalan, 2018).

Of course, it could be objected that the resulting organization could operate independently of its creators or any other central authority. Because DAOs are open source, all their rules, transactions, and actions are recorded on the blockchain and can be viewed by anyone, usually providing complete transparency and immutability. However, this organization must be registered in a jurisdiction that allows this activity or accepts these innovative initiatives.

Autonomy will also be enhanced through artificial intelligence and machine learning using network functions in the blockchain (Mienert, 2021). This will promote the interaction of DAOs between themselves. Code autonomy is a way to keep personal and collective agreements classified and non-disclosed to third parties irrespective of their power and wealth. A DAO will succeed only if smart contracts are transparent and verifiable (Mienert, 2021).

The appearance of the DAO idea is a larger revolution in scope than the idea of cryptocurrencies. This because DAO is about a decentralized emission of money and a decentralized management system (Mienert, 2021). Smart contract technology can potentially eliminate the need for banks, courts, and credit institutions. However, it is imperative to remember that DAO is a governing body, not the whole project.

Unfortunately, today the understanding of DAO as a decentralized autonomous organization is still very vague (Mienert, 2021). This is because the DAO model has no centralized hierarchy. Instead, one observes an alternative approach with their token-based system of acceptance. The idea behind these

tokens is that they can be bought and traded freely on various decentralized exchanges. Another option to obtain them is to earn via providing liquidity or computing power for mining or staking (Mienert, 2021). In any case, holding management tokens gives holders access to voting, which determines the organization's development strategy.

Now we need to forget about the classic board of directors and the company's CEO and imagine that there is a concept of an organization that does not require trust and that all its members are equals (Mienert, 2021). Everyone can raise the value of the project by taking an active part in its life, for example, by voting. Almost the entire process is automated and executed by a smart contract, not by a human. There are two types of DAO management:

1. Directly from participants through proposals and voting tools.
2. The community elects a DAO council, and that council votes on behalf of the community.

What is a DAO?

1. DAO is a self-organizing community with decentralized and automatically executed via blockchain functions of governance and voting, financial management, participation, compensation, and organization of workflows (Nielsen, 2019).
2. DAO is a distributed self-improving mechanism based on rules. It has a well-defined public process for any changes made to its codebase. There is no single point of control or deeming failure (Nielsen, 2019). The DAO code base can be improved using the built-in decision methods.
3. DAO is a new organizational form that allows resources to be coordinated through decentralized, provably neutral mechanisms. DAOs generate public goods similarly to traditional organizations such as corporations, NGOs, governments, and cooperatives (Wright, 2020). DAO is an excellent organizational form that allows for coordination with less overhead and more aligned incentives. That's why some of the most impressive products we see today appear in the DAO (Wright, 2020).
4. DAO is not a complete replacement for corporations. Still, it represents an alternative for many organizations that can benefit from a programmable management model and decentralization: corporations, cooperatives, religious organizations, schools, NGOs, government agencies and departments, and local communities (Nielsen, 2019).
5. DAO is the way an organization functions, not its legal form. A DAO may have legal personality in any or many jurisdictions (Wright, 2020). The DAO can (and often must) pay taxes according to local laws. But the form of the organization alone is not as important as the reason for the appearance, the community of participants, and internal processes.
6. Prerequisites for creating a DAO (A DAO starts with two things: a mission and a community/culture):
7. One believes in having a mission or product idea that will resonate with many other community members worldwide.

8. One already has an existing community within one's own culture and wants to create new development and monetization tools.
9. One can see the benefits of decentralizing work. One does not want to hire people on staff but organize work in smaller groups within the community.
10. One is interested in the global talent pool. The DAO operates 24/7 and has performed globally from day one, giving access to the best talent on the planet.
11. One wants to create an organization that will be owned and developed by the community.

Legal nature of DAO

There is no standard approach in the traditional legal system for interpreting what a DAO is. Some lawyers claim that it is a simple partnership. The others see this structure as an association. Western Europe tends to interpret it as a partnership. Finally, Wyoming and the Marshall Islands (Datta, 2021) are pioneers of RegTech in the DAO legal framework. Yet, it is still unclear which statement can be considered correct. The answer to this question has not yet been found due to the number of legal and regulatory use cases that exist at the moment. The world needs a fresh legal perspective from every country's government on current social needs. Before, when there was no guidance or implementation of the law, many crypto lawyers developed legal solutions for DAO registration using traditional legal institutions such as Foundations or companies with an LLC registration (Mienert, 2021). This is evident from the required registration process of a DAO in Wyoming, USA. This can be achieved in two forms, either online or offline. The entire process costs approximately $100 as a one-time fee for the registration and an extra $60 paid annually for reporting fees (Horwitz, 2022). Nonetheless, the registration process itself comprises several steps (Horwitz, 2022):

Step 1. Choose the form of application to the Secretary of State's office: online or offline, completing a specifically designed form.
Step 2. Select the type of LLC.
Step 3. Choosing an LLC business name that is available in Wyoming, USA.
Step 4. To register in Wyoming, USA, one would need a registered agent, which one has to appoint and mention in the specific form.
Step 5. Choose a DAO organizer who will be submitting the documents.
Step 6. Develop and file the Articles of Organization corresponding to the laws and regulations in Wyoming.
Step 7. Develop an operating agreement for the DAO that will contain every member's significant role, duties, and responsibilities.
Step 8. Apply for and get the EIN. This tax identification number must be legal with the tax authorities and a requirement for the organization to function legally.

The procedure is similar for both the Marshall Islands (Datta, 2021) and the city of Zug in Switzerland (Zalan, 2018). Although at the same time, the fee may vary. The registration procedure seems simple enough. However, are there now legal instruments for creating a DAO in each country? The response is more of a yes than no. Everything always depends on the specific "modifications" embodied in the client's project. For example, project management features, the interaction of

participants with the community, whether the goal of making a profit is inherent, a roadmap, etc. (Mienert, 2021). Speaking about the implementation of the DAO in individual countries, the first thing that comes to mind is creating a specific entity or public association. It is preferable to look at several problems that may arise in the process of registration and project implementation using traditional legal mechanisms inherent in legislation:

Social:

- A small number of legal professionals to develop documents that could create a "legal bridge" between On-chain and Blockchain (Mienert, 2021).
- The inability of state registrars to the new realities of WEB3 and the Blockchain field. The documentary correlation of the online world with the offline world can be misinterpreted, resulting in the impossibility of registering the desired association (Mienert, 2021).

Legal:

The previously mentioned "Public association" can be expressed in 2 forms:

- The public organization whose founders and members (participants) are individuals. In this example, the subjectivity of the participants is limited.
- A public union is a public association whose founders are legal entities of private law, and members (participants) can be legal entities of personal law and individuals. In this example, subjectivity in the institutional aspect is limited.

It is important to note that the essential characteristic of such an association is the absence of property interest for the first and the second option (Mienert, 2021). This means that: members (participants) of a public association are not entitled to a share of the property of a public association and are not liable for its obligations. Incomes or property (assets) of a public association are not subject to distribution among its members (participants) and cannot be used for the material satisfaction of any individual member (participant) of a public association (except for deductions for social events, such as "initiatives") (Mienert, 2021).

Also, it would be advisable to note several other important characteristics, such as:

- The founders of a public organization can be citizens, foreigners, and stateless persons who are in the country of registration on legal grounds, who have reached the age of 18, and youth and children's public organization - 14 years. It follows from this that the legislator does not have a residency requirement and that, in exceptional cases, a DAO can be created by young crypto enthusiasts.
- Public association founders may be legal entities of private law, including public associations with legal entity status.
- The legislator also set a requirement for the minimum number of founders of a public association. Not less than two persons.
- The bureaucratic aspect is also present in implementing this concept: a protocol for collecting founders and fixing several essential elements. Particular attention should be paid to the need to elect a leader and management bodies of a public association per the approved charter (hierarchy and DAO are mutually exclusive factors). But this paragraph does

not apply if our DAO operates without the status of a legal entity and the requirement for managers was not recorded in the protocol.

- Regardless of the chosen form (with or without the status of a legal entity), our formation is subject to registration.

This implementation format will not be appropriate for every DAO project; for a more accurate definition, one would require contacting lawyers practicing in this field while providing complete and reliable information about the project.

DAO as an LLC

As mentioned, the most widespread registration form of DAO is an LLC. Generally, this company is established by one or more legal entities and individuals, with the authorized capital divided into shares. At the same time, LLC founders are not liable for any obligations and are responsible for the losses associated with the activities of the company, within the value of their shares or shares in the authorized capital of the company, but only until the company is in the stage of bankruptcy. Thus, DAO, a limited liability company, is a community that unites one or more persons and has an authorized capital consisting of founders' shares. With this money and other property of the Limited Liability Company, the organization is liable for debts, and this obligation belongs to the category of joint and several. In case of company bankruptcy, the participants bear subsidiary liability for the company's debts with all their property.

This form of DAO registration has pros and cons, although currently, it is the only form of registration seemingly legal. We will consider them below:

Pros:

- Has no subjective restrictions on participation (individuals or legal entities).
- The regulated goals of the cooperative are like the plans of the DAO.

Cons:

- The nature of LLC's centralization and registration in a legal entity's status brings under question the relative proclaimed decentralization of the DAO.
- Bureaucracy in terms of documentation, establishing internal governments and providing variability of a lot of data to form.
- An open question on the relationship between the categories "physical asset" and "virtual asset."

The effectiveness of using the LLC form to implement a DAO project raises more questions than it answers and may only be appropriate for point projects. If there are circumstances in which neither the first option nor the second option would be considered reasonable, then it would be fair to consider incorporating a conventional LLC as a service company to meet the social and economic needs of the DAO.

In most countries now, there is no regulated definition of what DAO is. It would be reasonable to borrow the concept of the USA, the state of Wyoming - with precise regulation of the DAO, defining the main terminological interpretations and interactions of project management from the online to offline.

Requirements for DAO and how it works

1. The purpose of most DAOs is to create protocols by co-directing the interests of participants (contributors), users and investors.

2. It should be ready to train, onboard massively, and coordinate the work of new contributors. An adequately designed onboarding process allows anyone to become a member and, with enough time and commitment, a leader in the DAO.

3. Writing, lobbying, and executing props is perhaps a DAO's most essential and complex process. This combines politics (the ability to find compromise and social consensus around rather tricky issues), entrepreneurship (the ability to convince an organization to allocate (often measured in millions of dollars) funds and deliver concrete results at the end), and communication (the ability to correctly articulate the meaning of the task being performed as participants DAO, and a group of token holders, journalists, users).

4. It is required to make an open-source tool or protocol that will be managed and developed by the community.

DAO structure

Typically, a DAO has project leaders or "context managers" and a long tail of contributors with very different levels of involvement (Mienert, 2021). Leaders typically work full-time and invest time in building context and relationships within the organization. Their main goal is to provide clarity and build an infrastructure that allows participants to do meaningful work leading to a common goal (Mienert, 2021).

a. Instead of a hierarchical governance structure, the DAO has "emergent" leadership, where the entire system is designed to empower people to take action and lead the organization.
b. DAOs are "fractal" organizations. The DAO is not a monolithic organization. DAOs usually have a lightweight management tool that controls the treasury and critical parameters such as multisig participants and parameters.
c. Most DAOs have multiple worker threads:
    1. Development
    2. -Product
    3. Community
    4. People ops (employee lifecycle management)
    5. Compensation
    6. Marketing

d. There are projects in every workflow. Projects are broken down into tasks that require a leader to get things done and hold the team accountable. Working groups are fully responsible for the implementation of the project.

e. DAOs can choose legal shells for compliance, tax, and fiat payroll purposes. Many tools help with this: Korporatio, Fairmint.co, Etherize, Otonomos, and OtoCo.

General trends

Corporations must rethink their approach to culture, compensation, and people ops strategies to compete successfully in the new decentralized landscape.

Decentralization is the primary trend (Mienert, 2021). The first DAO is undoubtedly Bitcoin. Its mission is to create a decentralized public monetary system. Its community comprises miners, developers, users, node holders, and others. Satoshi has done a titanic job of making this decentralized organization, but today has virtually no influence on the future of Bitcoin. The community has built tens of thousands of businesses, products, applications, and organizations around Bitcoin. The community is developing new versions of the protocol, researching, lobbying in parliaments, and much more.

C. Conclusion

The DAO has never been and never will be about maximizing personal gain or profit. But DAO is about the balance of individual and collective. DAO is a structure that helps everyone to remain creative, realize the maximum of their potential, receive fair remuneration and be in a team of like-minded associates. DAO is an organization without a leader, without a control system, and with open and unlimited collaboration. DAO is about ownership.

DAO should help earn money for those who learn and create new successful systems based on this knowledge. Any person who makes a successful system gets a lot. We want to help you get there faster. Those who believe in success provide training, community access, and funding. It turns out that those who have accumulated tokens can invest them in other people and their systems.

In theory, the idea of a DAO idea has many pros. Management automation allows to get rid of the staff and managers so as to be able to decrease the impact of the human factor thereby eliminating all corruption and abuse of power. The complete rejection of centralization, despite the technical feasibility, is still a somewhat romantic idea.

An example is a fully decentralized online store that will sell digital products like games, art, and music. The DAO is also a perfect fit for any crowdfunding activities, freelance exchanges, philanthropy, and venture capital funding. However, things like logistics, author authentication, and even the proper motivation of DAO participants are still challenging to implement on a fully decentralized basis. As of now most DAOs are restricted to the fintech niche, media, GameFi, and metaverses. Decentralized autonomous organizations now have great potential, but it is difficult for them to go beyond the digital space. The real sector is currently omitted. However, it seems that this is just a matter of time. Nonetheless, if a code vulnerability is identified, it will be a real challenge to prevent theft. Much more than in a centralized organization.

The DAO could become one of the critical approaches to allow companies and various businesses to fundraise and resolve legal issues without the mediation of centralized institutions. This allows you to bypass bureaucratic difficulties and create a reputation as a "people's" enterprise. The question is, can such a model of organization exist outside of the digital space? We'll see you shortly.

So far, the idea's effectiveness is visible only in the cryptocurrency industry, which initially required complete decentralization. In real money, the problem of guarantees - financial and legal - invariably arises. The potential of the DAO is just beginning to unfold - experts are sure that in five years, instead of company shares,

tokens will be issued, and all processes will be optimized and completely go online. In any case, the DAO standard is our future.

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