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Data Science for Fraud Detection (https://blog.codecentric.de/en/2017/09/data-science-fraud-detection/)

Decentralized Autonomous Organization – Organizations on the Blockchain (https://blog.codecentric.de/en/2017/09/decentralized-autonomous-organization-blockchain/)

09/01/17 by **Jonas Verhoelen (https://blog.codecentric.de/en/author/jonas-verhoelen/)**

No Comments (https://blog.codecentric.de/en/2017/09/decentralized-autonomous-organization-blockchain/#comments)

Classical organizations are known to us in all dimensions: From small to gigantic, from non-profit to capitalist, the global organizational landscape is composed of various forms and structures. However, the most frequent commonality between these manifestations is that all organizations have a central authority that executes most of the control.

With increasing distribution of the blockchain technology (What is blockchain? (https://blog.codecentric.de/en/2017/07/what-is-blockchain/)), the first decentralized autonomous organizations have emerged. They aim to manage themselves in self governance by cutting out middlemen and providing trust and transparency by using a blockchain.

But what exactly is a Decentralized Autonomous Organization (DAO) about?

What is a DAO?

A Decentralized Autonomous Organization is an organization defined by Smart Contracts (distributed computer programs). These contracts are kept alive by a blockchain. The code is therefore executed in a decentralized manner and the state is maintained by a consensus in the system.

These contracts, which are often referred to as "programmable money", use source code to implement all available transactions, cash flows, rules and rights of the organization. The members of the organization could, for example, be recorded and managed on the basis of these smart contracts. They are then able to interact with the organization internally. From then on, they are permanently listed in the history of the blockchain, which can be imagined as a database. Their affiliation with the organization can always be demonstrated by the blockchain history.

To achieve this, the necessary Smart Contracts must be deployed and expanded over time. This means that an already existing group of people creates the basis for the actual DAO and ensures that it can be built on it. The modification of the organization thus takes place through changes to its code. This must therefore be implemented again, tested, reviewed and deployed. The state (members, finances, decisions, etc.) is changed by transactions on the blockchain in connection with the existing smart contracts.

This all sounds very abstract and futuristic, so we'll next look at a few examples and use cases for DAOs.

Examples and Use Cases

So far, DAOs are mainly found in the FinTech sector. The main focus here is on the digital currencies, which can benefit from a sophisticated and fast organizational structure in a volatile and fast-moving market.

A well-known and quite purist example is "Dash" (Digital Cash) . Dash aims to be the perfect digital cryptocurrency: it is fast, secure, fully digital and it avoids double spending. The further development of the project and its funding are publicly proposed and decided by the community . Proposals can be submitted and voted by the community. Those who run master nodes to keep up the network have a special role in those votings. The operator must freeze a lot capital in Dash to prove his interest in the system. Thus, within a relatively short time, decisions that often take projects and classical organizations months or even years, are made within a relatively short time. This seems to work great for Dash because of its good incorporation of external contractors who are even paid in the Dash currency.

A rather bitterly remembered example is "The DAO" , a venture capital fund implemented through an Ethereum Smart Contract . During the then token sale in 2016, in which investors were able to buy shares, a vulnerability in the code was exploited. About a third of the totally funded investments were stolen by the attackers. This incident is still being discussed controversially and it led to a hardfork of the Ethereum Blockchain resulting in two different projects, blockchains and currencies: Ethereum and Ethereum Classic.

The social media platform Steemit is also run by a DAO (steem.io). The aim is to reward the creation of good social media content and to draw attention to them. Bloggers, entrepreneurs and readers are brought together and rewarded for their work. Rewards are transferred in their own currency and can be paid out or used to reward others. The required infrastructure for the platform is also deployed decentrally and is stated to be more scaleable than Reddit .

Based on the listed examples and the generic nature of the blockchain and Decentralized Autonomous Organizations, it becomes clear that there are no limits to possible uses. DAOs can map processes, money flow, decisions, shares and many other aspects on the blockchain. The next big projects could already be organized in this way.

However, we are talking about something completely new, the potential and risk of which is not yet fully known. Therefore, we should take a look at current discussions and shed light on advantages and disadvantages.

Components and properties of a DAO

A bunch of contracts does not constitute a meaningful organization on its own. An organization must be able to make decisions, be liquid and communicate with internal and external bodies. After all, money must get into the organization, employees and service providers have to be paid and interaction with the rest of the world must be possible.
The following components are taken from today's DAOs and synergies with the Blockchain technology. What additions the future of the blockchain world provides for us remains to be seen.

Autonomy

All components must be implemented via a blockchain and its mechanisms. Source code is common property and can be seen by everyone. There is no central administrative body. Despite the fact that the organization has to be created by someone (without the DAO components already being in place), it must be guaranteed that there is no central instance in the system that can be seen as a "backdoor". Given this autonomy, the influence of the outside world on the organization can be kept as minimal as possible.

Currency

In order not to tie itself completely to a central currency, the DAO's ecosystem should best be given its own currency, also called "tokens". This is used for payment, external investments and finally the building of assets within the organization. The DAO is therefore at least internally liquid. Financial interactions with the outside world that uses fiat currencies, are done through exchanges. An indirect point of contact with classic currencies like dollar or euro seems unavoidable.

Proposals

In order for the organization to develop further, decisions about its future must be made. But first, there must be a place where the community can discuss it and submit ideas. This can be implemented quite democratically using proposals that any member of the organization (or a particular role) can submit and vote on.

Transparency

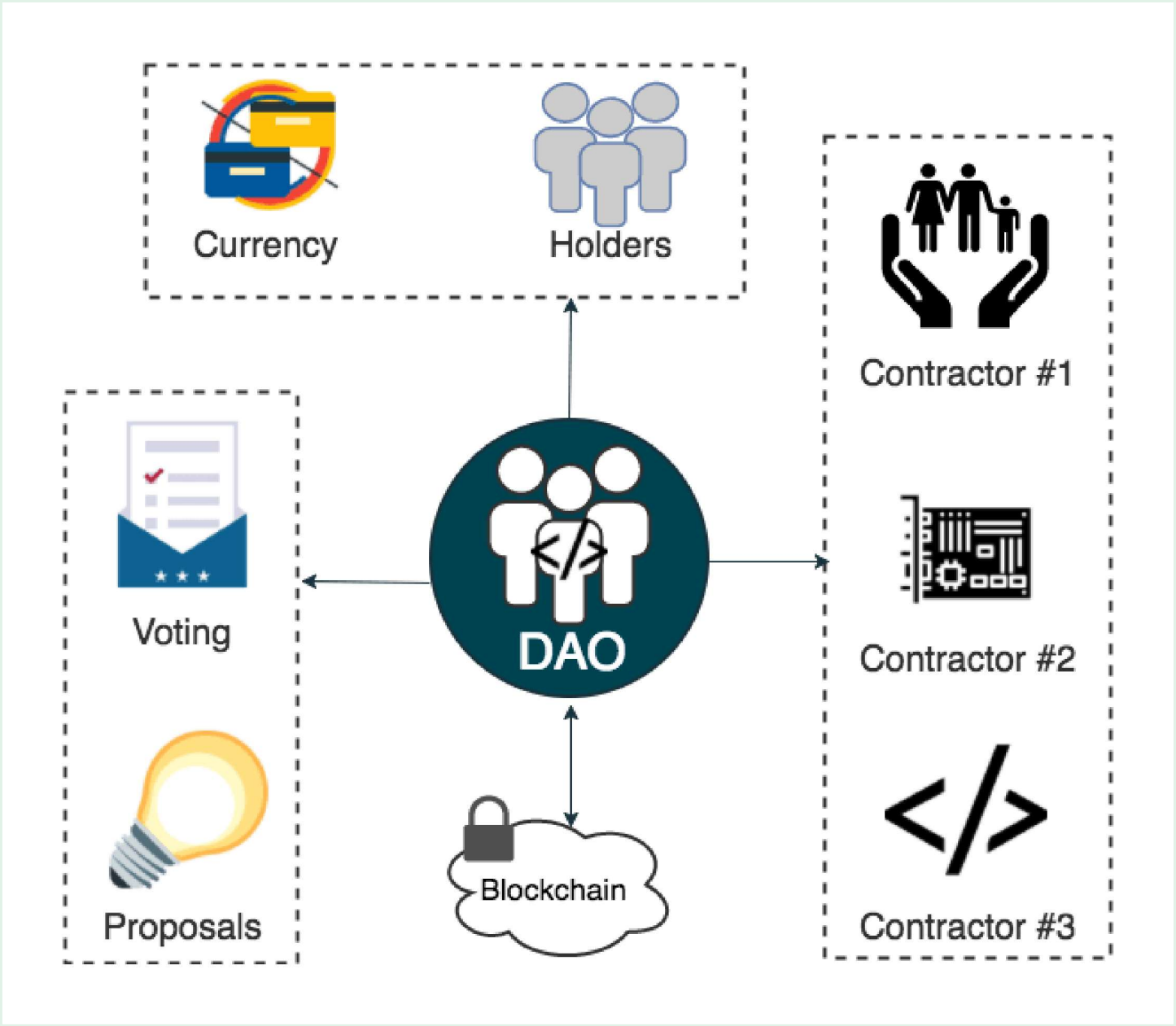
For members of the organization, all processes and mechanisms must be completely transparent, so everyone can participate and work together on a proposal. By capturing all aspects and processes on the blockchain, this is also given and manipulation is made impossible, at least in theory. The result is trust within the entire organisation.

Vote and consensus

Members are also allowed to vote democratically on budget, implementation, and ideas from the community. Members must reach a consensus. They may be of different opinions, but ultimately have to agree on a consensus to determine the state of the blockchain. At Bitcoin, for example, the miners must have the same understanding about which payment history is valid and is accepted as the truth.
If this is the case, the organization is already in a position to make decisions and to operate in the world

External Contractor

Members of the organization can influence the development of the organization and, of course, be involved in the implementation of the accepted proposals. According to implemented rules, they may even be rewarded. Nevertheless, it is likely that the organization needs help with the implementation of software development, marketing and other areas in their business.
External service providers from the "central world" are probably unavoidable. Payment may be made either in its own currency or by partial liquidation into fiat currencies.



(https://blog.codecentric.de/files/2017/08/dao-components.png)

Advantages, disadvantages and the future

A lot of this sounds unusual. However, some advantages are obvious: maximum automation, minimal costs and fast decisions. No employees are needed for the administration, which is necessary for the mere existence of a DAO. Human work is automated and greatly reduces the complexity and inertia of classical companies. Moreover, no single branch is needed. Contributors from the community and contractors can therefore work from all over the world.

A DAO dissolves from any central aspect and can still be anywhere in the world. In addition, it is theoretically not bound to any state or government – if there is no registered organization, where is it officially located? The simplest answer is probably: nowhere.

For a DAO, this sounds very beneficial: All the complex laws and taxes that companies have to take care of are eliminated. It is, however, doubtful whether it will remain like this in the future. It seems unfair to usual economy and many governments and corporations are likely to see this as an attack. The risk of strict regulation or even boycotting at the threshold between a DAO and the "real world" is a big unresolved issue.

Another controversial point is trust. Blockchains are supposed to bring about confidence, DAOs are thus trustworthy organizations, as each participant relies on the system being implemented fairly and constantly improved. For example, since the system is implemented by Smart Contracts, which are essentially distributed code, the entire organization trusts a program. Programs are still being developed by humans who are prone to errors.
A large risk is thus vulnerabilities in the respective blockchain software and the Smart Contracts executed on it. "The DAO" showed that a small mistake can cause the card house to collapse. When this happens, there is no rescue or legal barrier that can help shareholders. All trust lies in the code.

A glimpse into the crystal ball does not reveal whether software can ever be error-resistant. Likewise, we do not know whether and how governments will regulate DAOs and how the rest of the world will deal with them.
How does it go on from here? We must once again content ourselves with not being able to see into the future.

Summary

Decentralized Autonomous Organizations are an interesting development which, with the interest in the blockchain technology, is moving into the spectrum of digital products. Basically, it describes an organizational form that is fully manifested in software and not bound to any location, state, and government. Participants and external contractors are in charge of implementation and further development, since a DAO itself usually does not have any employees. It promises to be a flexible, favorable and transparent form of organization.

Despite the interesting advantages and lively examples sprouting from the ground with the boom of cryptocurrencies, there are still some unexplained questions. This includes statelessness and legal certainty.
On the threshold between DAO and "normal" economy, there is a risk of regulation and boycotting from classical parties (governments, banks, corporations).
Also the deep vulnerability of a DAO due to faulty source code or technical risks like the 51% attack is controversially discussed and still raises many questions.

For a world and economy with more confidence, transparency, fairness and progress it is certainly interesting to follow and support the developments around blockchain. There are surely organizations, projects and companies that could find a better home in a DAO.

Tags

BLOCKCHAIN (HTTPS://BLOG.CODECENTRIC.DE/EN/TAG/BLOCKCHAIN/)

Jonas Verhoelen (https://blog.codecentric.de/en/author/jonas-verhoelen/)

As a full stack developer, Jonas is passionate about developing digital products in agile, cross-functional teams. He prefers to use cloud native ideas such as Serverless and managed services from AWS (Amazon Web Services). Originally influenced by Java, he now prefers Node.js, TypeScript and modern JavaScript tooling.