

Fischer, Aron; Valiente, María-Cruz

**Article**

## Blockchain governance

Internet Policy Review

**Provided in Cooperation with:**

Alexander von Humboldt Institute for Internet and Society (HIIG), Berlin

*Suggested Citation:* Fischer, Aron; Valiente, María-Cruz (2021) : Blockchain governance, Internet Policy Review, ISSN 2197-6775, Alexander von Humboldt Institute for Internet and Society, Berlin, Vol. 10, Iss. 2, pp. 1-10,  
<https://doi.org/10.14763/2021.2.1554>

This Version is available at:

<https://hdl.handle.net/10419/235958>

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Governance  
Volume 10 Issue 2



GLOSSARY  
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## Blockchain governance

**Aron Fischer** *Colony* aron@colony.io

**María-Cruz Valiente** *Universidad Complutense de Madrid* mcvaliente@ucm.es

**DOI:** <https://doi.org/10.14763/2021.2.1554>

**Published:** 20 April 2021

**Received:** 18 November 2020 **Accepted:** 15 December 2020

**Competing Interests:** The author has declared that no competing interests exist that have influenced the text.

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**Citation:** Fischer, A. & Valiente, M.-C. (2021). Blockchain governance. *Internet Policy Review*, 10(2). <https://doi.org/10.14763/2021.2.1554>

**Keywords:** Blockchain, Governance

**Abstract:** Blockchain governance can be regarded as the integration of norms and culture, the laws and the code, the people and the institutions that facilitate coordination and together determine a given organisation.

This article belongs to the **Glossary of decentralised technosocial systems**, a special section of *Internet Policy Review*.

## Definition

Blockchain governance can be regarded as the integration of norms and culture, the laws and the code, the people and the institutions that facilitate coordination and together determine a given organisation.

## Origin and competing definitions

The importance of governance is well recognised in the information technology (IT) industry (ITSM Library, 2008) and this term is widely used in academic, economic and policy debates. In the blockchain space, this term has been tightly linked to *Decentralised Autonomous Organisations* (DAOs) (Buterin, 2013). Unfortunately, there is no common understanding, or generally accepted formal definition of *governance*, when associated with blockchain-based technologies. In pursuit of a formalisation of this term, before going more deeply into its evolution in the context of blockchain technology, we will briefly chart out a few common definitions.

The origins and most common approaches to governance are thoroughly dealt with by Hufty (2011), and as stated by Bevir (2011), at the most general level, governance can be associated with “*theories and issues of social coordination and the nature of all patterns of rule*”. The Oxford English Dictionary defines governance as “*the action or fact of governing a nation, a person, an activity, one’s desires, etc.; direction, rule; regulation*.” In an economics context, governance is defined as “*the use of institutions, structures of authority and collaboration to allocate resources and coordinate the effort and activity in society or in the economy*” (Bell, 2002).

On the other hand, from an IT *perspective*, governance is composed of the leadership and the set of structures and processes that guarantee that the IT of an organisation provides support and extends the organisation’s strategy and objectives in a manner that is focused on achieving a better alignment between the business and IT (van Bon, de Jong & Pieper, 2008). In contrast, Margaret Blair notes that corporate governance is “*the whole set of legal, cultural, and institutional arrangements that determine what publicly traded corporations can do, who controls them, how that control is exercised, and how the risks and returns from the activities they undertake are allocated*” (1995, p. 3), as quoted in Clarke (2012). However, the meaning of corporate governance could vary considerably according to the values, insti-

tutions, culture and objectives pursued by each organisation as well as the corporate governance system in the jurisdiction where the corporation is registered (Pollman, 2019; Norbäck & Persson, 2009). Corporate governance is not just about accountability, and it has an important role enabling strategising, value creation and innovation, as highlighted by Kraakman et al. (2017).

In this context, Morell (2014) presents the term *community governance* which is defined as the direction, control and coordination of a dynamic process, which evolves over time and manages several aspects of power classified by eight inter-related categories, from 'cultural principles/social norms' and 'formal rules or policies', to 'infrastructure provision'.

## **Academic review of the term in the blockchain domain**

Despite the gap in literature due to the lack of a formal, comprehensive and holistic definition of what governance means in different domains, we can find several papers focused on governance whose approaches are applied or could be applied to blockchain technology.

For example, Reijers et al. (2016) explore how blockchain technology enables the configuration of specific forms of political organisation using the Ethereum network as a case study, based on the idea that the blockchain can act as a legal framework that provides the basis for online interactions of any kind in terms of governance.

Similarly, Davidson et al. (2016) share the idea that by eliminating the need for trust of agreed contracts through consensus and transparency, blockchains enable a new type of governance for autonomous organisations with the legal coordination properties of a market. Further, the governance attached to these decentralised autonomous organisations could be implemented as blockchain-based software systems through smart contracts (i.e., small pieces of code deployed on the blockchain) (De Filippi & Wright, 2018). Although the fact that the blockchain is operated autonomously, could itself raise problems for corporate governance, such as corporate record-keeping and the maintenance and upgrading of blockchains themselves (Yermack, 2017).

Another approach is the use of notions of governance of the commons derived from the study of natural resources, particularly the work of the Nobel-laureate Elinor Ostrom (1990) as the basis for blockchain-based self-governance (Rozas et al., 2018). They identify and conceptualise six affordances that blockchains may

provide including tokenisation, formalisation and decentralisation of rules, autonomous automatisations, decentralisation of power over the infrastructure, increase in transparency and codification of trust.

Data governance is another less explored approach presented by Micheli et al. (2020). In their work, governance is defined as the power relations between all the actors affected by, or having an effect on, the way data is accessed, controlled, shared and used, the various socio-technical arrangements set in place to generate value from data, and how such value is redistributed between actors.

Finally, in another line of research, Karjalainen (2020) presents an informative survey of governance models in blockchain-based decentralised networks. It is worth highlighting that consensus mechanisms inherent in blockchain transactions have been excluded from this study.

## Usage of the term ‘blockchain governance’

We find relevant visions of governance in the context of blockchain, for instance, in the works presented by Finck (2018) and Reijers et al. (2018). However, as mentioned earlier, the academic research for *blockchain governance* is still somewhat sparse (see also: Pelt et al., 2020), and while governance is a much discussed topic at blockchain conferences, such as Ethereum Devcon, the annual conference for all Ethereum developers, researchers, thinkers, and makers (DevCon Archive, n.d.); *Community Ethereum Development Conference* (EDCON, n.d.); *Ethereum Community Conference* (ETHCC, n.d.); and DAOfest, an event series focused on advancing the technology and adoption of decentralised governance globally (DAOfest, n.d.), the written record still comprises mostly blog posts and social media entries of dubious quality.

As stated previously, all governance is ultimately a social construct, comprising not simply laws (or bylaws), but also norms, culture, institutions, and individuals. Despite impassioned claims to the contrary, this is no different in regard to blockchains.

To understand the (mis-)usage of the notion of *blockchain governance*, we must first consider what specifically blockchains bring to the table: they enable systems in which adherence to procedure is automatically enforced, relying neither on norms nor a legal system, and leaving no room for individual discretion. This strict separation of enforceable procedure on the one hand and norms and discretion on the other is genuinely novel, but its import is exaggerated. Among the more enthusi-

astic supporters of blockchain technology, we observe a tendency to wilfully ignore all questions of norms and culture and equate *governance* entirely with coded procedures (*code is law*). Once all governance is reduced to procedure, it is hard to resist the claim that blockchains change everything.

This mixture of confusion and hubris is exemplified nicely in Singh (2020), who introduces "standard" governance as being either *direct governance* or *representative governance*, thus conflating governance with voting procedures, and asserting that everything is different with the blockchain: "*We can broadly categorize the governance types into two major categories: Standard Governance and Blockchain Governance*" (n.p.).

A further ambiguity stems from the fact that *blockchain governance* is used in two related but distinct contexts—governance of the chain itself vs governance using the chain. Additionally, usage in the first context is further complicated by the highly polarised and politicised nature of the blockchain space where we observe different factions reinterpreting and redefining the phrase to fit their outlook.

In this first usage, *blockchain governance* refers to *governance of the blockchain* (i.e. the specific question of making consensus-relevant changes to the software running a blockchain). *Consensus relevance* here means a change to the internal rules of the blockchain that must be applied (i.e., software must be updated) by all relevant participants in the blockchain network such as cryptocurrency exchanges, wallet software providers, miners, and users. If a large enough portion of the network does not apply the changes, then the network splits into two: those following the new rules and those following the old rules—this is called a *hard fork*<sup>1</sup>.

Examples of this approach include: (i) Curran (2020), who uses *blockchain governance* to vaguely mean whatever process leads to consensus-relevant changes in the software, and hard forks are hailed as a safety valve for users to choose their own fork if things go awry; and (ii) Rajarshi (2020), where governance is conflated with voting procedures, and hard forks are hailed as enabling "*much more flexibility in operation than traditional structures*" because "*a user is free to choose which blockchain to follow*."

In this context, we typically observe the introduction of a strict separation of gov-

1. This term itself is not well defined. Thus *hard fork* may refer to a network split where different actors in the network follow different rules, whether due to an update that was not universally installed or due to a software flaw; but it is also used to describe a successful network upgrade that could have led to a split but did not.

ernance into *off-chain governance* and *on-chain governance*.

The main idea of *on-chain governance* is to use coded procedures within a blockchain that represent voting procedures by which decisions about consensus-relevant software upgrades are mediated through the consensus system itself. Usage of the term in industry is neatly summarised by Frankenfield (2018): "*On-chain governance is a system for managing and implementing changes to cryptocurrency blockchains. In this type of governance, rules for instituting changes are encoded into the blockchain protocol. Developers propose changes through code updates and each node votes on whether to accept or reject the proposed change*".

Proponents of this way of doing things disparage the off-chain (human) world as being outdated in its reliance on people, norms, and culture to achieve *governance*, specifically alleging that procedures might be ill-defined or opaque: "off-chain collectives that organize over phone calls or at conferences, which either leads to shadow hierarchies where only a few, unwritten people make decisions" (Petrowski, 2020, n.p.). Central to this line of thought is that anything on-chain is transparent and thus fair, and anything off-chain is hidden and potentially nefarious. This stands in contrast to the Bitcoin notion that *all* consensus relevant changes are bad because they represent human involvement and in as much as code is law, they are breaking the law (De Filippi & Wright, 2018). On-chain governance, they argue, only aids and abets such law breaking; arguing that the goal is not coordinated updates to the network, but immutability.

The other context in which *blockchain governance* is used ignores the previous question entirely and focuses on using the blockchain to achieve governance. It presupposes the existence of a functioning blockchain network such as Ethereum, which can be leveraged to deploy smart contracts that encode the procedures of a decision-making paradigm. The blockchain is used to force/guarantee adherence to procedure, but the decisions being made have nothing to do with the blockchain itself (i.e., upgrading, avoiding hard forks). Rather, the goal of this form of *on-chain* governance is to enable the creation and operation of DAOs (i.e., organisations whose bylaws are written in code and enforced by the blockchain).

Once a DAO has been deployed to a blockchain, its rules can no longer be changed—short of a hard fork of the underlying network. Envisioning the need for future changes, DAO authors must incorporate the rules-for-changing-the-rules in the original deployment. We may think of this as analogous to an ordinary legislative process, coupled with a process for amending the constitution that the legislation is based on.

Current prominent examples of DAO platforms such as Aragon (Aragon, n.d.) and Daostack (DAOstack, n.d.) place heavy emphasis on a process in which proposals—usually to reallocate cryptocurrency funds—are put forward, a voting procedure then determines passage of the proposal, and eventually the funds are moved. This all happens on the blockchain, though off-chain communication and discussion are alluded to. Other examples such as Colony (Rea et al, 2020) take a more holistic view of governance, involving primarily off-chain interactions between human beings to come up with ideas and make decisions, and usage of the blockchain is reserved for enforcement, as opposed to decision making, whenever this is feasible.

It is worth noting that all DAO projects are ultimately a mixture of off-chain and on-chain elements, echoing the idea that even with blockchains and cryptocurrencies, governance consists of more than coded procedures.

## Conclusion

As we have seen, the concept of *blockchain governance* is still under development and it can be understood differently depending on the domain of the application area under discussion.

In a broad sense, *blockchain governance* can be regarded as the integration of norms and culture, the laws and the code, the people and the institutions that facilitate coordination and together determine a given organisation. Importantly it refers to the entirety of motivations, rules, and activities that feed into the establishment of choices and subsequently deciding on them, and includes, but is not limited to, any coded on-chain rules that guide these processes.

However, *blockchain governance* also refers to two distinct dimensions: off-chain governance vs on-chain governance.

When referring strictly to smart contracts, one should specify that one is referring specifically to the on-chain elements of the governance system in question. Further care should also be taken to clarify whether one is talking about governance of a blockchain's own consensus relevant rules, or whether the governance system in question is merely using a blockchain to enforce on-chain rules in an otherwise unrelated off-chain domain.



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