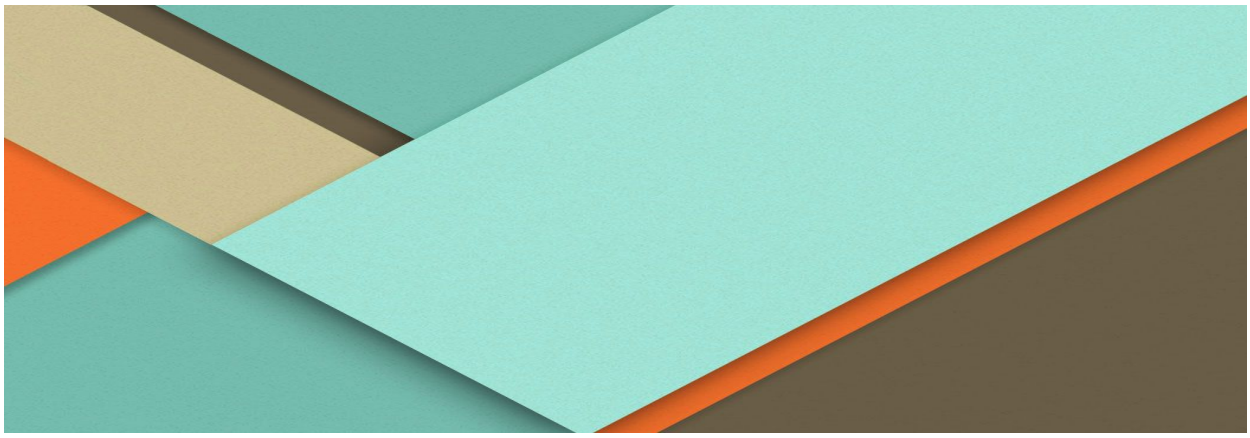

The Decentralized Autonomous Organization and Governance Issues

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Discussion Paper

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Abstract: The Decentralized Autonomous Organization (DAO) represents an innovation in the design of organizations, in its emphasis on computerized rules and contracts, but the DAO's structures and functions also raise issues of governance. This discussion paper enumerates those issues, so as to encourage further research on DAOs and governance.

The Decentralized Autonomous Organization and Governance Issues

The Decentralized Autonomous Organization (DAO) represents an innovation in the design of organizations, in its emphasis on computerized rules and contracts (see Dilger 1997, Dupont 2017, Jentzsch 2016, Norta et al 2015, Norta 2016, Swan 2017), in an age of blockchain technology and cryptoanarchist decentralized structures (see Chohan 2017a, 2017b, 2017c, 2017d, 2017e, 2017f). However, the DAO's structures and functions also raise issues of governance (see Chohan 2017g, 2017h, 2017i, 2017j, 2017k, 2017l) that also require urgent academic and practitioner attention, particularly since (1) DAOs are still considered entities that are somewhat ineffable or at the very least difficult to describe, and (2) the precise legal status of the DAO organizational-type is yet indeterminate.

For the purposes of definition, a DAO[1] , is an organization that is run through rules encoded as computer programs called "smart contracts." A DAO's financial transaction record and programmed rules are maintained on a blockchain, which ostensibly increases transparency dramatically at the expense of security. Real-world examples of this business model include *Dash governance*, *The DAO*, and *Digix.io*. Of these, the best-known practitioner example is the former entity of *The DAO*. Its governance and security issues are worth particular attention because, when it was launched with $150 million in crowdfunding in June 2016, with smart contract implementation through the technology of Ethereum, The DAO was instantaneously hacked and drained of US$50 million in cryptocurrency (see also Chohan 2017a, 2017b, 2017c, 2017d, 2017e, 2017f). The hack on the DAO was nullified the subsequent month, and the money was restored

[1]DAOs are also called decentralized autonomous corporation (DACs)

through a hard fork intercession of the Ethereum blockchain, and was the product of a decentralized bailout made possible by a majority vote of the blockchain's hash rate.

Although still considered difficult to describe as an organizational type, the conceptual basis of a DAO has been typologized by an underlying ability of blockchain technology to provide a secure digital ledger that tracks financial interactions across the internet (see Chohan 2017a), bolstered against forgery by a method known as *trusted timestamping* and by dissemination of a distributed database. The advantage of this approach is that it eliminates the need to involve a bilaterally accepted (trustee-oriented, see Chohan 2017h) 3rd-party in a financial transaction, which simplifies the sequence. From a financial standpoint, such a process reduces the costs associated with a blockchain-enabled transaction with ensuring the availability of the associated data, and this is because of the elimination of both the trusted third party, as well as the elimination of the need for continual recording of contract exchanges in different records. Extending this logic outwards, if regulatory authorities allowed it (see also Chohan 2017b), blockchain data could supplant the need for public documents related to the governance and accountability associated with rights to ownership as are normally assigned by titles and deeds. This is because a blockchain approach would allow multiple cloud-computing users to forge a loosely formed peer-to-peer smart contract collaboration.

A further extension of the logic of the DAO, along cryptoanarchist principles (see Chohan 2017e), is that DAOs may be constructed in a manner that allows function without human managerial interactivity, so long as the underlying *smart contracts* are made robust and substantiated by Turing-complete mechanisms (see original work in Nordin 1995). Since cryptocurrencies such as

Ethereum (see Chohan 2017a) can meet the Turing threshold, the DAO's autonomous functionality can be enabled.

There is a strong connection between DAOs and cryptoanarchist thought, because a well-run DAO should serve as a transparent platform wherein individuals can still maintain control over their personal data and their identities (see also Chohan 2017e).

That said, governance issues in the context of DAOs still require a systematic exploration. One problem emerges from the procedural nature of voting on DAO-related modifications. As an example, the BitShares exchange has been faced with a lack of voter participation, an absence of voter engagement, because of the labor required to consider each proposal. The procedural nature of the DAO's alterations is thus a first governance consideration.

The second accountability problem relates to the legal indeterminacy of DAO. This consideration is pressing because, in the past, similar organizational structures have regarded by the U.S. Securities and Exchange Commission as illegal offers of unregistered securities. This may be circumvented, but only to a slight degree, in the formation of a general partnership structure as opposed to a corporation - but that would entail assuming unlimited liability for participants, even if smart contract code or the DAO's promoters and vendors state otherwise. This is a frightening legal burden that may impede the development of DAOs, and the underlying accountability structures must be visited carefully, so as to comply with the legal frameworks. *Le cas écheant,* any known participants, or persons who are at the interface between a DAO and regulated financial systems, may be targets for regulatory enforcement or civil actions.

A third problem is in the essential construction of the DAO. The code of a DAO will be extremely difficult to alter once its system is in function / in operation. This extends to the trivial such as bug fixes in centralized code. However, if bugs are not fixed, they leave the DAO vulnerable to all sorts of attacks. At the same time, initiating fixes would require (1) the writing of new code, and (2) an agreement to migrate all the funds. This creates a dichotomy between transparency and security: although the code is visible to everyone, it is difficult to repair.

A fourth problem emerges from the risks of voter manipulation - it is important for safeguards to exist such that groups of voters do not scheme machinations against the DAO machine. This horizontal accountability will be a necessary resource in preserving the democratic nature of the DAO's subjacent cryptoanarchist thought.

In sum, while the DAO represents a technological innovation with much promise in leveraging blockchain to push for an autonomous, self-managing, transparent, more efficient organization, the nature of (1) accountability, (2) security, (3) transparency, and (4) democracy vis-a-vis the DAO have yet to be considered in significant detail. New research must build on existing foundations to propose both theoretical and practical solutions to the functionality of the DAO in light of the abovementioned challenges.

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