DECENTRALISED AUTONOMOUS ORGANISATIONS:
The Future of Corporate Governance or an Illusion?

***Brian Sanya Mondoh** **

***Dr. Sara Adami-Johnson** ***

Matthew Green** *

Dr. Aris Georgopoulos** **

Brian Sanya Mondoh Attorney-at-Law at the Bar of Trinidad and Tobago, L.E.C Pg. Dip in Law (Hugh Wooding Law School, Trinidad), Barrister of England and Wales (Lincoln's Inn), LL.M (Distinction) (Nottingham Law School, UK), BPTC Pg. Dip Law (Nottingham Law School, UK), LL.B (Hons) (Nottingham Law School, UK), B.A. Psychology (Daystar University, Kenya)

Dr. Sara Adami-Johnson (Ph.D) Attorney-at-Law at the State Bar of California, Ph.D in International Business Management (International School of Management, France), LL.M (Antonin Scalia Law School, Mason University, USA), LL.M (Pallas Consortium of European Universities), LL.B (University of Milan, Italy)

Matthew Green Solicitor of England and Wales, LPC (Distinction) (University of Law, UK), GDL (University of Law, UK), B.A. English and History (University of Nottingham, UK)

Dr. Aris Georgopoulos (Ph.D) Attorney-at-Law at the Athens Bar, Asst. Professor of Law at the University of Nottingham, UK, Head of the Research Unit for Strategic and Defence Procurement for Social Sustainability and Human Rights (Public Procurement Research Group - PPRG, University of Nottingham, UK)

Abstract

"What things will be like, when, if ever, they have attained righteousness" [1]

A Decentralised Autonomous Organisation ('DAO') is a term used to describe a 'virtual' organisation embodied in computer code and executed on a distributed ledger or blockchain.[2] DAOs implement smart contract code (discussed below) to automate organisational governance and corporate decision-making tackling issues and operational systems inherent in traditional corporations.[3]

Firstly, DAOs can be used by participants working together collaboratively outside of a traditional corporate form. Secondly, DAOs can also be used by a registered corporate entity to automate formal governance rules contained in corporate bylaws or imposed by law (Jentzsch, 2016).

Likened to a 'digital co-operative', a DAO's participant maintains direct real-time control of contributed funds and the DAO's governance rules are formalised, automated and enforced using smart contract code. A smart contract, i.e. a self-executing code on a blockchain, executes business logic when predetermined conditions are met i.e "*if "x" occurs, then execute step "y"* [4] (Szabo, 1994).[5] Smart contracts are designed to execute and monitor contractual conditions (such as payment terms and enforcement of legal agreements amongst other things). Arguably, smart contracts could lower various transactional costs and losses, minimise malicious and accidental occurrences, and also diminish the need for trusted intermediaries and centralised institutions such as central banks and reserves (Szabo, 1994).

Around the world, the legal status of DAOs remains the subject of active and vigorous debate and discussion. Some commentators suggest that DAOs are autonomous code and can operate independently of legal systems; others suggest that they must be owned or operated by humans or human created entities. Ultimately, how a DAO functions and its legal status will depend on many factors, including how the DAO's code is programmed and by whom, where, and for what purposes it is used (Jentzsch, 2016).

[1] "On Man's Perfection in Righteousness" St Augustine
[2] SECURITIES AND EXCHANGE COMMISSION SECURITIES EXCHANGE ACT OF 1934 Release No. 81207 / July 25, 2017 Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO, https://www.sec.gov/litigation/investreport/34-81207.pdf
[3] Jentzsch, C. (2016). Decentralized autonomous organization to automate governance [White Paper].
[4] Stuart D. Levi and Alex B. Lipton, *An Introduction to Smart Contracts and Their Potential and Inherent Limitations,* Harvard Law School Forum on Corporate Governance (May 2018) https://corpgov.law.harvard.edu/2018/05/26/an-introduction-to-smart-contracts-and-their-potential-and-inherent-limitations/#3
[5] Nick Szabo, Smart Contracts, 1994 http://www.virtualschool.edu/mon/Economics/SmartContracts.html

Background

A Decentralised Autonomous Organisation ('DAO') is an entity, whereby rules and decision making are driven by pre-defined protocols, which allows it to be decentralised and autonomous. To expand further, it is a blockchain-based system that enables participants to coordinate and govern themselves toward a common goal through self-executing smart contract codes deployed on a public blockchain (De Filippi & Hassan, 2016).[6]

DAO code is mostly created using the 'Solidity' programming language. Solidity is an object-oriented, high-level language for implementing smart contracts running on the Ethereum Virtual Machine.[7] A contract in Solidity is a collection of code ('its functions') and data ('its state') that resides at a specific address on the Ethereum blockchain.[8] The contract defines the governance rules of the organisation and holds the group's treasury. Once the contract is live on Ethereum, no one can change the rules except by a vote.[9] For context, there are other smart contract languages, but those are beyond the scope of our publication.

The purported goal of DAOs is to successfully manage the assets under their control and to maximise their net economic returns (Minn, 2019).[10] DAOs are distributed and decentralised i.e. independent from a central control or a single point of failure. DAOs are also tamper-resistant meaning they cannot be manipulated by any single party without the consensus of the majority in the network.

As discussed below, Slock.it The *DAO,*[11] was the first implementation of a DAO-type entity to automate organisational governance and decision making. The *DAO's* whitepaper proposed innovative dynamics for distributed crowdfunding and set out rules of governance upon which the code would function and enforce.

[6] De Filippi, P., & Hassan, S. (2016). Blockchain technology as a regulatory technology: From code is law to law is code. *First Monday*, *21*(12). https://doi.org/10.5210/fm.v21i12.7113
[7] Introduction to Smart Contracts: https://docs.soliditylang.org/en/v0.8.14/introduction-to-smart-contracts.html, See: https://docs.soliditylang.org/
[8] Geeks for Geeks, What is Smart Contract in Solidity?
https://www.geeksforgeeks.org/what-is-smart-contract-in-solidity/
[9] Decentralized Autonomous Organizations: https://ethereum.org/en/dao/
[10] Minn Taeck, K. (2019), Towards Enhanced Oversight of "Self-Governing" Decentralized Autonomous Organizations: Case Study of The DAO and Its Shortcomings
https://jipel.law.nyu.edu/wp-content/uploads/2020/01/Minn_Article.pdf
[11] Christoph Jentzsch, Decentralized Autonomous Organization to Automate Governance Final Draft – Under Review, https://download.slock.it/public/DAO/WhitePaper.pdf.

DAOs rely on code to grant members the ability to control or direct the organisation's assets either directly or indirectly (Wright, 2021).[12] Once deployed, the DAO becomes independent of its smart contract developers and contains rules, which are embedded in code. The rules are self-executed independently of the will of the parties (Wright, 2021). Each DAO is structured differently, but usually, when joining a DAO, participants agree to the protocols in place. The data that triggers execution of the smart contract can be internal to the blockchain protocol or the smart contract can receive the data from an outside source.[13] Smart contracts are not modifiable once deployed, and the outcome of their execution cannot be reversed. If anyone tries to do something that's not covered by the rules and logic in the code, it will fail. In the event of an error, a register must be recreated, and the smart contract must be run again.

It has been argued (Wright, 2021) that DAOs are just 'Decentralised Organisations' ('DOs') because they are not fully autonomous. Most 'DAOs' are managed by distributed consensus—using smart contracts to aggregate the votes or preferences of members and can be described as participatory DAOs. As a result, human intervention is always needed to make decisions. In its truest form, a DAO ought to be entirely algorithmic and can be described as an algorithmic DAO. In this way, the underlying smart contracts coordinate human activity and are not dependent on human decision-making to technically operate (Wright, 2021).

Theoretically, DAOs can be architecturally decentralised with independent actors running different nodes, and are geographically decentralised (situated in different jurisdictions), but they are logically centralised because the rules set in the protocol will always be a point of centralisation (Voshmgir, 2019).[14]

Worth noting, there are computational lawyers involved in smart contract development and DAO legal engineering, and have launched DAOs aimed at simplifying the legal structuring of DAOs[15] based on the philosophy of *'code is law'* (Lessig, 1999).[16]

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[12] Wright, A. Clinical Professor of Law at Benjamin N. Cardozo School of. (2021). *The Rise of Decentralized Autonomous Organizations: Opportunities and Challenges*. Stanford Journal of Blockchain Law & Policy. https://stanford-jblp.pubpub.org/pub/rise-of-daos

[13] Henning Diedrich, Ethereum (2016); See Carla Reyes, If Rockefeller Were a Coder, 87 GEO. WASH. L. REV. 373 (2019).

[14] Shermin Voshmgir, Tokenized Networks: What is a DAO?, BLOCKCHAINHUB (July 2019), https://blockchainhub.net/dao-decentralized-autonomous-organization.

[15] KaliDAO, https://app.kalidao.xyz/; See LexDAO, https://www.lexdao.coop/, The LAO, https://www.thelao.io/

[16] Lessig Lawrence, *'The New Chicago School'* (1998) 27 JLS 661. This framework is also known as the 'New Chicago School framework' or the 'pathetic dot theory'. Also, commentary suggests that the widespread deployment of rules administered through self-executing smart contracts and decentralised (autonomous) organisations will lead to expansion of a new subset of law, term *Lex Cryptographia*. See, Wright, Aaron and De Filippi, Primavera, Decentralized Blockchain

Membership

A DAO has a certain set of members or shareholders, which with a pre-established majority quorum, for example: 67% of members, have the right to spend the entity's funds and modify its code. The members collectively decide on how the organisation should allocate its fund (Vitalik Buterin, 2013).[17] DAO members purchase 'governance tokens', which are native cryptocurrencies that are tied to a specific DAO's project, and the proceeds are then allocated to DAO's treasury's account (Schwinger, 2022).[18] DAOs are 'flat' organisations with no formal delegation of power made to specific participants, nor is any participant crowned as having superior powers.[19] Ideally, participants enter and engage with co-equals to add equal (or similar) value to the community (Lund, 2022).

Depending on members' investment/stake in the project, DAOs provide them with protocol-based ownership rights, which may include the right to access, manage, or transfer the DAO's resources, services and membership. Majority stakeholding can also be associated with specific privileges, in terms of utility, embedded in the code, providing members with the opportunity to engage in an organisation's decision-making and governance processes. The code also specifically allows for profit sharing based on each participant's stakeholding.

The global, borderless, permissionless nature of blockchain enables members to participate in a DAO regardless of their physical location, background, or creed (Wright, 2021). Whilst the minimum membership numbers for a DAO are unclear, the term 'organisation' is likely to refer to an entity comprising multiple ('two or more') people acting towards a common goal rather than a legally registered organisation (De Filippi & Hassan, 2016).

Technology and the Rise of Lex Cryptographia (March 10, 2015). Available at SSRN: https://ssrn.com/abstract=2580664 or http://dx.doi.org/10.2139/ssrn.2580664

[17] Buterin, V. (2013). Ethereum whitepaper: A next-generation smart contract and decentralized application platform [White Paper]. https://blockchainlab.com/pdf/Ethereum_white_paper-a_next_generation_smart_contract_and_decentralized_application_platform-vitalik-buterin.pdf

[18] Robert A. Schwinger, *DAOs Enter the Spotlight,* https://www.law.com/newyorklawjournal/2022/03/21/daos-enter-the-spotlight/

[19] Lund Dane, DAO Governance Primer: Flat DAOs https://lund.mirror.xyz/Fe5BYyO5oMcVeXyXUK1iZX4QM-KVBc4azAG5jjU6ETM

As we will discuss in depth below, for some DAOs legally wrapped as Delaware limited liability companies, the maximum membership is capped at 99 members so as to comply with United States ('U.S.') Securities law amongst other regulations.[20] Interestingly, when Slock.it the *DAO* launched in May 2016, more than 10,000 people worldwide invested in the *DAO*.[21]

DAOs -v- Corporate Structure

DAOs seem to present anti-fragile and flexible operational advantages, at least as compared to existing legal organisational structures in that: membership can be attained at the click of a button in comparison to formal appointment based on pre-defined roles,[22] assets can be moved in a matter of seconds and in some instances, there is no need to interact with third party intermediaries and institutions such as banks, there is no centralised authority or top-down hierarchical governance structure and all transactions are memorialised on a blockchain ledger.

A DAO is a dispersed and communal entity. Community members submit proposals to the group, and each node can vote on each proposal (Daugherty & Lehot, 2021).[23] Just like other blockchain-based applications, DAOs are argued to exhibit a high degree of transparency and tamper-resiliency, quicker transactional movement, while also avoiding protracted contested decision-making, deadlocks and fraudulent behaviour (Wright, 2021).

A drawback is that DAOs are currently unconsidered substantively at law, with no consistent recognised legal status in the U.K. as in other common law or civil law jurisdictions (Armstrong et al, 2019), which troubles regulators and policy makers because it is not clear who bears legal rights and responsibilities.[24] Consequently,

[20] The LAO, https://docs.thelao.io/membership.html
[21] Cade Metz, The Biggest Crowdfunding Project Ever—the DAO—Is Kind of a Mess, WIRED: BUS. (June 6, 2016), https://www.wired.com/2016/06/biggest-crowdfunding-projectever-dao-mess.
[22] TalentDAO, NoDW #4: Decentralized Leadership, https://talentdao.substack.com/p/nodw-4-decentralized-leadership
[23] Daugherty D.P. and Lehot L., DeFi and the DAO: How the Law Needs to Change to Accommodate Decentralized Autonomous Organizations,
https://www.foley.com/en/insights/publications/2021/12/louis-lehot-defi-dao-how-law-needs-to-change
[24] Dean Armstrong, Dan Hyde and Sam Thomas, *Blockchain and Cryptocurrency:International Legal and Regulatory Challenges,* Bloomsbury Professional 2019;
https://www.bloomsburyprofessional.com/uk/blockchain-and-cryptocurrency-international-legal-and-regulatory-challenges-9781526508393/

DAOs are not an established and widely implemented form of business association (for example a DAO cannot be registered at Companies House in England and Wales), making it difficult for DAOs to interact with other entities imposing heightened personal risk on their members. Despite commentary suggesting that an unincorporated DAO could be deemed by a court to comprise an unincorporated general partnership, no court has made this finding yet (Brummer & Sierra, 2022).[25]

If courts or legislators were to construe DAOs as general partnerships, its participants are likely to owe each other fiduciary duties as partners who may be held jointly and severally liable in the event legal proceedings are brought against the DAO. As it is, the implied relationship between DAO members—is not that of a fiduciary, but rather that participants stand on equal footing, therefore, no member of a DAO owes a fiduciary duty to the organisation or any other member (Wright, 2021). Respectful and good-faith discussion should be the cornerstone of any decision-making process. In addition, participants may join and exit *("rage quit")* a DAO at any time as they have no loyalties to a particular DAO, unless the protocol or code has specific processes for exiting or liquidating membership.

Legal Wrapping

It is worth noting that in the U.S., DAOs could be legally wrapped as Unincorporated Nonprofit Associations (abbreviated as 'UNAs') and Limited Cooperative Associations (abbreviated as 'LCAs'). In July 2021, The State of Wyoming enacted legislation[26]to control the creation and management of DAOs. In March 2022, Wyoming amended the Decentralized Autonomous Organizations (DAO) Supplement (Supplement), which permits DAOs to incorporate and obtain legal status as limited liability companies under Wyoming's Limited Liability Company Act.[27] Supporters of the DAO Supplement believe it will not only protect DAOs from being sued as

[25] Brummer, Christopher J. and Seira, Rodrigo, Legal Wrappers and DAOs (May 30, 2022). Available at SSRN: https://ssrn.com/abstract=4123737 or http://dx.doi.org/10.2139/ssrn.4123737
Sarcuni et al v. bZx DAO et al. (S. D. Cal., 2 May 2022) filed in the US District Court for the Southern District of California is the first to allege that a DAO is operating as an unincorporated partnership.
[26] CHAPTER 29 - WYOMING LIMITED LIABILITY COMPANY ACT
https://sos.wyo.gov/Forms/WyoBiz/Wyoming_Limited_Liability_Company_Act_and_Close_LLC_Supplement.pdf
[27] SF0068 - Decentralized autonomous organizations-amendments; https://www.wyoleg.gov/Legislation/2022/SF0068
See, Troutman Pepper (May 2022), Wyoming Amends DAO Legislation Enabling DAOs to Dictate Quorum Threshold on an Individual Basis
https://www.jdsupra.com/legalnews/wyoming-amends-dao-legislation-enabling-2457236/#:~:text=On%20March%209%2C%20Wyoming%20amended,Wyoming's%20Limited%20Liability%20Company%20Act.

general partnerships but also solidify the rights of DAOs as legal persons and provide clarity and structure to many DAO projects.[28]

Under Wyoming DAO law, a DAO's articles of organisation may define the DAO as either member-managed or algorithmically managed, and, if the articles are silent, the DAO defaults to a member-managed organisation.[29] Notably, Wyoming DAO law requires that, for an algorithmically managed DAO, the underlying smart contracts must be able to be updated, modified, or otherwise upgraded.[30] Therefore, DAOs that take advantage of being incorporated under Wyoming's LLC law will maintain some modicum of centralisation and human control.

Additionally, the DAO's articles of organisation must be amended when the DAO's smart contracts have been updated or changed.[31] In April 2022, Tennessee passed its own DAO legislation. Tennessee's statute, however, refers to the entity type as a "Decentralised Organisation," or "DO." (The omission of "autonomous" is likely a nod to the reality of how most DAOs actually function.) 'DO LLCs' are also subject to Tennessee's standard LLC law (Teague 2022).[32]

Internationally, offshore entity structures like the Cayman Foundation Company and Guernsey Special Purpose Trust also exist as legal wrappers for DAOs (Brummer & Sierra 2022). Despite sharing some common features, DAOs differ dramatically from one another in terms of their purpose and operation, and as a result, particular legal wrappers may make sense in one situation, but not others (Brummer & Sierra 2022).

[28] Dilendorf Law Firm (2021), Forming and Operating a Wyoming DAO LLC https://dilendorf.com/wp-content/uploads/2021/06/Forming-and-operating-a-Wyoming-DAO-LLC.pdf
[29] Wy. Stat. § 17-31-104(e)
[30] Wy. Stat. § 17-31-105(d)
[31] Wy. Stat. § 17-31-107(a)(iii)
[32] Teague Jordan (June 2022), Starting a DAO in the USA? Steer Clear of DAO Legislation A Primer on DAO Legislation in Multiple States, https://thedefiant.io/starting-a-dao-in-the-usa-steer-clear-of-dao-legislation/

Liability

In terms of liability for DAOs, the first putative class action lawsuit ***Sarcuni et al. v bZx DAO et al.*** **(S. D. Cal. May 2, 2022)** was filed in the Southern District of California. This negligence action is based on the legal theory that a DAO is a 'general partnership' exposing its members to joint and several liability for allegedly failing to reasonably secure their Decentralised Finance ('DeFi') protocol (designed for tokenized trading on margin and lending) resulting on the theft, by a hack, of $USD 55 million.[33]

The English High Court in ***Tulip Trading[34] Limited v Bitcoin Association for BSV and others*** **[2022] EWCH 667 (Ch)** considered liability by open-source cryptocurrency developers to cryptocurrency end-users. The High Court held that the Defendants did not owe any fiduciary or tortious duties as alleged, because the developers of the network software were a fluctuating body of contributors without any organisation or structure. Questions of partnership were not considered. However, it is suggested that liability will not be imposed on DAO participants' unless individual members undertake to act for or on behalf of another in circumstances, which give rise to a relationship of trust and confidence.[35] The distinguishing obligation of a fiduciary is the obligation of undivided loyalty, which will be evidenced through the intentions of contracting parties and programmers (Allen & Brendish, 2022).[36]

Governance

Governance refers to the processes, rules and procedures relied upon to maintain the protocol (Finck, 2018).[37] This encompasses actual protocol modification as well as the deliberation and decision-making processes relevant to managing and coordinating an entire community towards the achievement of a common goal (Van

[33] Skadden, Arps, Slate, Meagher & Flom LLP and Affiliates, Putative Class Action Lawsuit Alleges DAO Members Are Jointly and Severally Liable for a Cryptocurrency Hack;
https://www.skadden.com/insights/publications/2022/05/putative-class-action-lawsuit-alleges-dao-members
[34] See Judgment: https://www.bailii.org/ew/cases/EWHC/Ch/2022/667.html
[35] Bristol and West Building Society v Mothew [1996] EWCA Civ 533
[36] Allen Emma and Brendish Samantha, Don't lose your keys: Bitcoin developers do not have a duty to assist owners in recovering lost cryptocurrency,
https://www.taylorwessing.com/en/insights-and-events/insights/2022/04/dqr-bitcoin-developers-do-not-have-a-duty-to-assist-owners-in-recovering-lost-cryptocurrency
[37] Finck, M. (2018). Blockchain Regulation and Governance in Europe. Cambridge: Cambridge University Press. doi:10.1017/9781108609708

Pelt et al, 2021).[38] DAO governance comprises a mix of 'on-chain and off-chain' deliberations and decisions on how the DAO should evolve and be administered (De Filippi & Loveluck, 2016).[39]

For on-chain governance, a decision is reached by the DAO's coin (or DAO's crypto) holders on the blockchain, and the protocol adapts automatically to install the endorsed update. Miners exercise no agency. Off-chain governance is more complex as it refers to the processes around the protocol that contribute to its maintenance. The actors involved in off-chain governance are, accordingly, more diverse as they include not only coin holders and miners but also core developers and the wider community. Even if a collective or a coin vote leads to an agreement, they lack the means to enact their decision; the true power still lies outside the protocol per se, i.e., with miners or validators (Petrowski, 2020).[40]

The *DAO* Exploit... 'A Case of Fragile Code'

In 2016, The *DAO*, the early DAO-structure we mentioned, organised by Slock.it, was intended to allow cryptocurrency investors to directly fund and manage new enterprises – all to be run on the Ethereum blockchain (DuPont, 2017). The *DAO* was governed according to a majority vote by its investors, instead of entrusting the entirety of the investors' assets to a central manager who decides how to manage The *DAO*'s assets (Jentzsch, 2016). The *DAO* was the largest crowdfunding event in history raising over $USD 150 million. However, it was short-lived. The *DAO* was hacked through the exploitation of several vulnerabilities in its code. This resulted in the syphoning of $USD 60 million and the remedy of last resort was to 'hard fork' ('forcefully split') the Ethereum blockchain to restore the funds raised by the *DAO* and those taken by the attacker.

Commentary suggests that The *DAO* hack itself was entirely *legitimate* according to the smart contract code (Zou, 2020).[41] This was because The *DAO* had no terms and conditions or governing laws prohibiting such a hack, which paradoxically meant that an attacker could transfer the funds without repercussions (Georgiev,

[38] Rowan van Pelt, Slinger Jansen, Djuri Baars & Sietse Overbeek (2021) Defining Blockchain Governance: A Framework for Analysis and Comparison, Information Systems Management, 38:1, 21-41, DOI: 10.1080/10580530.2020.1720046

[39] Primavera De Filippi & Loveluck, B. (2016). The invisible politics of Bitcoin: Governance crisis of a decentralised infrastructure. *Internet Policy Review*, 5(3), 1–28. [Crossref], [Web of Science ®], [Google Scholar]

[40] Joe Petrowski, *Polkadot Governance,* https://polkadot.network/polkadot-governance/

[41] Mimi Zou, *Code, and other Laws of Blockchain,*Oxford J Legal Studies (2020) 40 (3): 645

2016).[42] A section of the community purported that any kind of hard fork was tantamount to an existential system's deceit, arguing that code is law (Lessig, 1999), along the lines of the dictum: *'what is written in the code is the rule of law to abide upon'*, and that any effort to block the attacker would be morally wrong and against the very spirit of decentralised autonomous organisations (DuPont, 2017).[43]

Surprisingly, the attacker wrote a letter to the community, supporting this very position of supreme algorithmic authority and that he or she "rightfully claimed" Ether tokens by exploiting an embedded "feature" of The *DAO*'s structure that was designed to "promote decentralisation". Notwithstanding the diatribe, a hard fork was initiated by the underlying blockchain and Ethereum Foundation in order to stop the attacker from draining funds. The minority viewed this intervention as censorship, or proof that blockchain technology was unable to live up to its idealistic promise of decentralisation, immutability and tamper resistance. Others, however, argued that, despite such ideals, a hard fork was an obvious choice when a community was faced with an existential financial crisis of such kind (Vitalik Buterin, 2017). In the circumstances, decentralisation and immutability should not promote a powerless stand against attackers, even in absence of a formal democratic decision-making process for calling for the hard fork (Dupont, 2017).

The *DAO* exploit underscores the importance of implementing good and pragmatic governance (Campbell-Verduyn et al 2017).[44] Ideally, The *DAO* was supposed to represent a turning point in legal authority, where code is law and that collaboration can be governed by algorithms (Jureta, 2021).[45] Contrary to the ideological underpinnings of code is law and of blockchain's decentralised trust and immutability, the hard fork retroactively invalidated transactions that were formally valid within code. In doing so, The *DAO* exploit illustrates that autonomous entities can still produce less favourable outcomes from a "purist" perspective, and just like traditional organisations, DAOs are unable to completely escape the risk of governance problems and dispute resolution.

[42] Hristo Georgiev, The Hack That Changed the Blockchain Perspective, MWR LABS (Aug. 11, 2016), https://labs.mwrinfosecurity.com/blog/the-hack-that-changed-the-blockchain-perspective
[43] DuPont Q, Experiments in Algorithmic Governance: A history and ethnography of " The DAO, " a failed Decentralized Autonomous Organization, https://iqdupont.com/wp-content/uploads/2018/06/DuPont-Experiments_in_Algorithmic_Governance-2017.pdf
[44] Campbell-Verduyn, M., Goguen, M., and Porter, T. (2017). Big data and algorithmic governance: The case of financial practices. New Political Economy, 22(2): 219–36.
[45] Jureta I., Limits of Decentralized Autonomous Organizations, https://ivanjureta.com/limits-of-decentralized-autonomous-organizations-dao/

The *DAO* exploit also highlights that unguided and unchecked dispute resolution in such a nascent area of technology, still mostly beyond the reach of legislated regulations, will most certainly result in unfair outcomes and processes (Minn 2019). More recently, in April 2022, an attacker managed to exploit Beanstalk Farms'[46] governance mechanism and sent funds to a wallet the attacker controlled. The attacker, in this case, took advantage of the protocol's security loopholes and gained possession of about 67%-79% voting power, which was more than the ⅔ voting threshold, and approved corrupted system proposals. The attacker fled with over $USD80 million in Ether (ETH) and 36 million in Beans (BEAN) from the protocol. Consequently, the protocol lost all its Total Value Locked ('TVL'), which was around $USD 180 million (Rajpalsinh 2022).

Unprecedented 'Emergency' Powers

On 19 June 2022, the Solana[47] DeFi platform, Solend, through a majority, voted on an emergency governance proposal to take over a whale's[48] account with an "extremely large margin position" so that the whale's funds could be withdrawn instead of automatically liquidated on the open market.

Contrary to principles of decentralisation, there was no language suggesting further options or strategies that could be implemented; either take control or do nothing. Reports also suggested that participants were incentivized with an 'airdrop'[49] for voting on the proposal with only one thought-out course of action.[50] The Solana community condemned the move, calling it the 'opposite of what DeFi should be and outright illegal'. The Solend team was forced to initiate a second governance proposal vote to invalidate the previously-approved proposal and to find another solution that did not involve forcibly taking over an account.

[46]Beanstalk Farms Suffers $182M Loss in DeFi Governance Exploit
https://www.cryptotimes.io/beanstalk-farms-suffers-182m-loss-in-defi-governance-exploit/, See; Beanstalk Farms Hacked: Total Damage is 182 million,
https://medium.com/uno-re/beanstalk-farms-hacked-total-damage-is-182-million-b699dd3e5c8
[47] Solana, https://solana.com/
[48]A whale refers to individuals or entities that hold large amounts of cryptocurrency. Whales hold enough cryptocurrency that they have the potential to manipulate currency valuations.
https://www.investopedia.com/terms/b/bitcoin-whale.asp
[49]An airdrop involves sending coins or tokens to wallet addresses of active members of a blockchain community for free or in return for a small service.
See; What is a Cryptocurrency Airdrop? https://www.investopedia.com/terms/a/airdrop-cryptocurrency.asp
[50] Wright, A. Liam. Solend pays users to vote on proposal to liquidate whale wallet OTC and avoid "bad debt"
https://cryptoslate.com/solend-pays-users-to-vote-on-proposal-to-liquidate-whale-wallet-otc-and-avoid-bad-debt/

Conclusion

Unsurprisingly, The *DAO*'s case exemplifies that human intervention in certain circumstances is still required to implement complex decisions that have a direct effect on the off-chain and physical environment and members' livelihoods. Viewing DAO governance through a corporate governance lens helps explain the Ethereum community's choice to hard fork the Ethereum protocol after The *DAO* hack (Del Castillo, 2016).[51] Nonetheless, research is still unclear as to whether algorithmic DAOs should be limited to simple decision rules, and tough decisions reserved for community-wide ruling through participatory DAOs.

Commentary suggests that the technical conception of a DAO can be summarised as, *"automation at the centre, humans at the edges"* (Vitalik Buterin, 2014).[52] This invites the question; whether fully autonomous and solely automated DAOs, without any human intervention, are actually desirable or if the concept of 'autonomy' should be interpreted in a broader sense so that human participation is called in to perform tasks that automation is, at this juncture, unable to optimise, such as engaging in litigation or solving conflicts that arise. Given the nascent nature of DAOs and the uncertainties of their legal treatment in many jurisdictions, *only time will tell* how these organisations will be regulated and defined and ultimately their success. However, the promise of DAOs is far from guaranteed and they are not without risk.[53] Until then, the development and testing of their vulnerabilities greatly assists in how communities define, adopt and interact with DAOs.

[51] Michael del Castillo, The Hard Fork: What's About to Happen to Ethereum and the DAO, COINDESK (July 24, 2016), https://www.coindesk.com/hard-fork- ethereum-dao [https://perma.cc/7U9G-AN6X].
[52] Buterin Vitalik; DAOs, DACs, DAs and More: An Incomplete Terminology Guide, https://blog.ethereum.org/2014/05/06/daos-dacs-das-and-more-an-incomplete-terminology-guide/
[53] TalentDAO, NoDW#1, https://talentdao.substack.com/p/nodw-1

REFERENCES

---

1. Allen Emma and Brendish Samantha, Don't lose your keys: Bitcoin developers do not have a duty to assist owners in recovering lost cryptocurrency https://www.taylorwessing.com/en/insights-and-events/insights/2022/04/dqr-bitcoin-developers-do-not-have-a-duty-to-assist-owners-in-recovering-lost-cryptocurrency

2. Armstrong D, Hyde D and Thomas S, *Blockchain and Cryptocurrency:International Legal and Regulatory Challenges,* Bloomsbury Professional 2019; https://www.bloomsburyprofessional.com/uk/blockchain-and-cryptocurrency-international-legal-and-regulatory-challenges-9781526508393/

3. Asmakov Andrew, Solana Lending DAO Overturns Vote to Take Over At-Risk 'Whale' Wallet, https://decrypt.co/103330/solana-lending-dao-overturns-vote-to-take-over-at-risk-whale-wallet

4. Beanstalk Farms Hacked: Total Damage is 182 million, https://medium.com/uno-re/beanstalk-farms-hacked-total-damage-is-182-million-b699dd3e5c8

5. Beanstalk Farms Suffers $182M Loss in DeFi Governance Exploit https://www.cryptotimes.io/beanstalk-farms-suffers-182m-loss-in-defi-governance-exploit/

6. Brummer, Christopher J. and Seira, Rodrigo, Legal Wrappers and DAOs (May 30, 2022). Available at SSRN: https://ssrn.com/abstract=4123737 or http://dx.doi.org/10.2139/ssrn.4123737

7. Buterin, V. (2013). Ethereum whitepaper: A next-generation smart contract and decentralized application platform [White Paper]. https://blockchainlab.com/pdf/Ethereum_white_paper-a_next_generation_smart_contract_and_decentralized_application_platform-vitalik-buterin.pdf

8. Cade Metz, The Biggest Crowdfunding Project Ever—the DAO—Is Kind of a Mess, WIRED: BUS. (June 6, 2016), https://www.wired.com/2016/06/biggest-crowdfunding-projectever-dao-mess.

9. Campbell-Verduyn, M., Goguen, M., and Porter, T. (2017). Big data and algorithmic governance: The case of financial practices. New Political Economy, 22(2): 219–36.

10. Daugherty D.P. and Lehot L., DeFi and the DAO: How the Law Needs to Change to Accommodate Decentralized Autonomous Organizations, https://www.foley.com/en/insights/publications/2021/12/louis-lehot-defi-dao-how-law-needs-to-change

11. De Filippi, P., & Hassan, S. (2016). Blockchain technology as a regulatory technology: From code is law to law is code. *First Monday*, *21*(12). https://doi.org/10.5210/fm.v21i12.7113

12. De Filippi primavera & Loveluck, B. (2016). The invisible politics of Bitcoin: Governance crisis of a decentralised infrastructure. *Internet Policy Review*, 5(3), 1–28. [Crossref], [Web of Science ®], [Google Scholar]

13. Del Castillo Michael, The Hard Fork: What's About to Happen to Ethereum and the DAO, COINDESK (July 24, 2016), https://www.coindesk.com/hard-fork- ethereum-dao [https://perma.cc/7U9G-AN6X].

14. Dilendorf Law Firm (2021), Forming and Operating a Wyoming DAO LLC https://dilendorf.com/wp-content/uploads/2021/06/Forming-and-operating-a-Wyoming-DAO-LLC.pdf

15. DuPont Q, Experiments in Algorithmic Governance: A history and ethnography of " The DAO, " a failed Decentralized Autonomous Organization, https://iqdupont.com/wp-content/uploads/2018/06/DuPont-Experiments_in_Algorithmic_Governance-2017.pdf

16. Finck, M. (2018). Blockchain Regulation and Governance in Europe. Cambridge: Cambridge University Press. doi:10.1017/9781108609708

17. Geeks for Geeks, What is a Smart Contract in Solidity? https://www.geeksforgeeks.org/what-is-smart-contract-in-solidity/

18. Hristo Georgiev, The Hack That Changed the Blockchain Perspective, MWR LABS (Aug. 11, 2016), https://labs.mwrinfosecurity.com/blog/the-hack-that-changed-the-blockchain-perspective

19. Henning Diedrich, Ethereum (2016);

20. Jentzsch, Christoph, Decentralized Autonomous Organization to Automate Governance Final Draft – Under Review, https://download.slock.it/public/DAO/WhitePaper.pdf.

21. Jentzsch, C. (2016). Decentralized autonomous organization to automate governance [White Paper].

22. Jureta I., Limits of Decentralized Autonomous Organizations, https://ivanjureta.com/limits-of-decentralized-autonomous-organizations-dao/

23. Lessig Lawrence, *'The New Chicago School'* (1998) 27 JLS 661. This framework is also known as the 'New Chicago School framework' or the 'pathetic dot theory'.

24. Lund Dane, DAO Governance Primer: Flat DAOs https://lund.mirror.xyz/Fe5BYyO5oMcVeXyXUK1iZX4QM-KVBc4azAG5jjU6ETM

25. Metjahic Laila, Deconstructing the DAO: The Need for Legal Recognition and the Application of Securities Laws to Decentralized Organizations
http://cardozolawreview.com/deconstructing-the-dao-the-need-for-legal-recognition-and-the-application-of-securities-laws-to-decentralized-organizations/

26. Minn Taeck, K. (2019), Towards Enhanced Oversight of "Self-Governing" Decentralized Autonomous Organizations: Case Study of The DAO and Its Shortcomings
https://jipel.law.nyu.edu/wp-content/uploads/2020/01/Minn_Article.pdf

27. Petrowski Joe, *Polkadot Governance,* https://polkadot.network/polkadot-governance/

28. Reyes Carla, If Rockefeller Were a Coder, 87 GEO. WASH. L. REV. 373 (2019).

29. Rowan van Pelt, Slinger Jansen, Djuri Baars & Sietse Overbeek (2021) Defining Blockchain Governance: A Framework for Analysis and Comparison, Information Systems Management, 38:1, 21-41, DOI: 10.1080/10580530.2020.1720046

30. Schwinger A. Robert, *DAOs Enter the Spotlight,*
https://www.law.com/newyorklawjournal/2022/03/21/daos-enter-the-spotlight/

31. Shermin Voshmgir, Tokenized Networks: What is a DAO?, BLOCKCHAINHUB (July 2019),
https://blockchainhub.net/dao-decentralized-autonomous-organization.

32. Skadden, Arps, Slate, Meagher & Flom LLP and Affiliates, Putative Class Action Lawsuit Alleges DAO Members Are Jointly and Severally Liable for a Cryptocurrency Hack;
https://www.skadden.com/insights/publications/2022/05/putative-class-action-lawsuit-alleges-dao-members

33. Stuart D. Levi and Alex B. Lipton, *An Introduction to Smart Contracts and Their Potential and Inherent Limitations,* Harvard Law School Forum on Corporate Governance (May 2018)
https://corpgov.law.harvard.edu/2018/05/26/an-introduction-to-smart-contracts-and-their-potential-and-inherent-limitations/#3

34. Szabo Nick, Smart Contracts, 1994 http://www.virtualschool.edu/mon/Economics/SmartContracts.html

35. TalentDAO, NoDW#1, https://talentdao.substack.com/p/nodw-1

36. TalentDAO, NoDW #4: Decentralized Leadership,
https://talentdao.substack.com/p/nodw-4-decentralized-leadership

37. Teague Jordan (June 2022), Starting a DAO in the USA? Steer Clear of DAO Legislation A Primer on DAO Legislation in Multiple States, https://thedefiant.io/starting-a-dao-in-the-usa-steer-clear-of-dao-legislation/

38. The LAO, https://docs.thelao.io/membership.html

39. Troutman Pepper (May 2022), Wyoming Amends DAO Legislation Enabling DAOs to Dictate Quorum Threshold on an Individual Basis https://www.jdsupra.com/legalnews/wyoming-amends-dao-legislation-enabling-2457236/#:~:text=On%20March%209%2C%20Wyoming%20amended,Wyoming's%20Limited%20Liability%20Company%20Act.

40. Wright, Aaron and De Filippi, Primavera, Decentralized Blockchain Technology and the Rise of Lex Cryptographia (March 10, 2015). Available at SSRN: https://ssrn.com/abstract=2580664 or http://dx.doi.org/10.2139/ssrn.2580664

41. Wright, A. Clinical Professor of Law at Benjamin N. Cardozo School of. (2021). *The Rise of Decentralized Autonomous Organizations: Opportunities and Challenges.* Stanford Journal of Blockchain Law & Policy. https://stanford-jblp.pubpub.org/pub/rise-of-daos

42. Wright, A. Liam. Solend pays users to vote on proposal to liquidate whale wallet OTC and avoid "bad debt" https://cryptoslate.com/solend-pays-users-to-vote-on-proposal-to-liquidate-whale-wallet-otc-and-avoid-bad-debt/

43. Zou Mimi, *Code, and other Laws of Blockchain,* Oxford J Legal Studies (2020) 40 (3): 645

Cases

1. Bristol and West Building Society v Mothew [1996] EWCA Civ 533
2. *Sarcuni et al v. bZx DAO et al.* (S. D. Cal., 2 May 2022)
3. *Tulip Trading Limited v Bitcoin Association for BSV and others* [2022] EWCH 667 (Ch) https://www.bailii.org/ew/cases/EWHC/Ch/2022/667.html

Legislation

1. CHAPTER 29 - WYOMING LIMITED LIABILITY COMPANY ACT https://sos.wyo.gov/Forms/WyoBiz/Wyoming_Limited_Liability_Company_Act_and_Close_LLC_Supplement.pdf

2. SF0068 - Decentralized Autonomous Organizations-Amendments; https://www.wyoleg.gov/Legislation/2022/SF0068

Reports

1. SECURITIES AND EXCHANGE COMMISSION SECURITIES EXCHANGE ACT OF 1934 Release No. 81207 / July 25, 2017 Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO, https://www.sec.gov/litigation/investreport/34-81207.pdf