**The Convergence of Artificial Intelligence and Distributed Autonomous Organizations:**
**(Auto)Generating New Legal Issues**
by Ronald L. Chichester[1]

I.        Abstract:

In recent years, two innovative concepts have gained significant traction in the world of technology and entrepreneurship: Artificial Intelligence ("AI") and Distributed Autonomous Organizations ("DAOs"). While AI has been around for decades, its applications have expanded significantly through advancements in machine learning, deep learning, genetic algorithms, and cognitive computing. Similarly, a DAO is a relatively new concept that has emerged as an alternative to traditional business organizations.  "While Web3 promises to disintermediate traditional business transactions, DAOs are designed to go one step further, decentralizing organizations themselves."[2]

In this article, I will explore the intersection of AI and DAOs, highlighting how artificial intelligence can enable distributed autonomous organizations to evolve and to adapt to changing market conditions. I will also delve into the potential applications of AI in writing smart contracts that extend the functionality of DAOs.  I will compare existing DAO-oriented state business organization statues and identify how some of their underlying assumptions have been rendered obsolete by the combination of AI and DAOs.

II.        Summary:

Artificial intelligence is all about decision-making.  We use ChatGPT to let the computer decide what we want to say, or how we want to say it.  We use other forms of AI to handle sometimes complex tasks without human intervention in a dynamic fashion that accommodates a given situation.   Currently, however, DAOs employ "static" decision-making because the smart contracts (code) that makes up the DAO is immutably set on the blockchain, and thus the DAOs decision-making is intended to be *determinative*.[3]  This notion that DAOs are deterministic is an underlying assumption made by investors and legislatures when selecting or devising corporate forms for DAOs.  However, technologically, there is nothing to prevent the combination of DAOs with AI, but that combination makes the DAO *indeterminate* and thus that combination calls into question the underlying assumptions implicit in current statutes.

III.        Background:

        1.        What is Artificial Intelligence?

While ChatGPT may be all the rage these days, its underlying technology is only subset of AI. In general, AI refers to the development of computer systems that can perform tasks that typically require human intelligence, such as learning, problem-solving, decision-making, and perception. AI systems use algorithms and data to analyze situations, draw conclusions, and make decisions without human intervention.[4]  There are many types of AI, but the ones that are relevant to this discussion are illustrated below:

Rule-based systems rely on predefined rules and logic to make decisions.[5]  These types of systems are used to automate corporate operations.  AI Planning enables companies to monitor events (such as market pricing) to predict future profitability and allocate resources accordingly.[6]  Machine learning is a type of AI that uses statistical models to learn from data and improve performance over time.[7]  Evolutionary programming, using a genetic algorithm, is type of AI that can generate, for example the best route to deliver goods, something based solely upon the user's (end) specifications – relieving the user from the need to understand logistics.[8]  Deep learning is a subfield of machine learning that uses neural networks to analyze complex data patterns.[9]  In the context of business organizations, all businesses have some type of business logic, some ability to learn from their market environment, and some ability to generate (or exploit) their traction in the market.  Consequently, AI is a natural fit for business organizations.

2.      What is a Distributed Autonomous Organization (DAO)?

A DAO is a decentralized organization that operates independently, without the need for intermediaries or centralized authorities. DAOs are typically created on blockchain platforms, which enable secure, transparent, and tamper-proof transactions.[10]

In a DAO, decision-making authority is distributed among its members, who vote on proposals to change the organization's operations or other make key decisions.[11] This decentralized governance model allows for greater autonomy and flexibility, as well as reduced costs and increased transparency.

For example, DAOs are often used in crowdfunding campaigns, in which contributors can participate in decision-making processes and receive a portion of the profits or tokens representing ownership shares.  DAOs have also been applied to other areas, such as social media platforms, cooperatives,[12] and decentralized finance (DeFi) applications.

This security and tamper-proof characteristics of DAOs exist because, once instantiated on the blockchain, the smart contract(s) that make up the DAO are "immutable."[13]  However, there are some methods to update the code and change the logic, and these methods create the potential for AI to change the DAOs business model after the initial smart contract for the DAO has been instantiated on the blockchain.[14]

3.     The Intersection of AI and DAOs: Enabling Evolution

As AI technologies continue to advance, they can be integrated with DAOs to enable more sophisticated decision-making processes and adaptability.[15] By applying AI algorithms to DAOs, organizations they can, for example improve governance by facilitating the voting processes, ensuring that decisions are made in a fair, transparent, and efficient manner.  AI can also optimize operations by analyzing data on organizational performance, identifying areas for improvement and suggesting adjustments to optimize outcomes.  Most importantly, AI can enhance decision-making because it can process large amounts of data, providing insights and recommendations that support informed decision-making.  Finally, combining these capabilities enables DAOs to self-govern by eliminating the need for human assistance in many (if not most or all) human positions.

4.     Genetic Algorithms: A Key Application of AI in DAOs

One type of AI algorithm that can be particularly useful in DAOs is the genetic algorithm (GA). GAs are inspired by the principles of natural selection and genetics, where solutions to problems evolve through a process of mutation, selection, and crossover.[16]  In mathematical terms, GAs are universal approximators.[17]  GAs are particularly useful when an individual ahs a desired goal, but does not know how to achieve that goal.

In the context of DAOs, GAs can be used to optimize smart contracts, which are self-executing contracts with predefined rules. By applying GA techniques to contract development, organizations can, for example, automate decision-making by creating smart contracts that automatically execute decisions based on predefined conditions.  GAs can also improve contract flexibility by optimizing contracts for different scenarios and outcomes, enabling greater adaptability in response to changes in market conditions.

Several examples demonstrate the potential applications of AI-enabled DAOs:

- Blockchain-based cooperatives: AI-powered DAOs can facilitate member engagement, decision-making, and resource allocation within cooperative organizations.
- Decentralized finance (DeFi) platforms: AI-driven smart contracts can automate lending, borrowing, and investment decisions on DeFi platforms.[18]
- Supply chain management: AI-enabled DAOs can optimize logistics, inventory management, and procurement processes in supply chain operations.

There is already a significant body of work in computer science where AI is combined with DAOs, so this is a present issue that will become only more significant in the future.[19]  Moreover, because DAOs affect relations among individuals, and regulating relations among individuals in a jurisdiction is at the core of law, the question becomes: "How are legislatures dealing with this trend in technology?

5.     Why Make Special Corporate Forms for DAOs?

As David Shakow notes, entities are taxable when partners agree to work together and divide their profits.[20] That arrangement fits the structure of DOAs well, so currently DAOs are treated like partnerships for tax purposes. Even though the DAO itself is decentralized, members are taxed individually in their respective jurisdiction. From a technological perspective, such a tax arrangement is fortunate because, the inherently *immutable* code for the DAO does not have to accommodate the inherently *mutable* tax code.

While a general partnership for a DAO makes great sense from a smart programming perspective, a general partnership does not limit liability for its participants. In fact, DAOs are yet another example of why limited liability companies were invented. The advent of AI-enabled DAOs only makes the need for limiting liability even more acute. Several states have addressed the limited of liabily for DAOs by enacting legislation.

6.      A Quick Review of Existing State DAO-Related Statutes

Some states, such as Delaware, simply state that, whether all or part of an LLC exists on a blockahin, its legal attributes will be identical.[21] However, five states have enacted laws directed to DAOs specifically, and to blockchain-based organizations more generally. Instructively, all of those laws focused initially on the limited liability company as the corporate form of choice.

a.      Vermont

Vermont was the first state to expressly allow "blockchain-based limited liability companies,"and in the process coined the acronym "BBLLC."[22] While Vermont did not expressly mention DAOs, the Vermont BBLLC is obviously applicable to those types of associations.[23] There are several features in the Vermont BBLLC entity. For example, "[a] BBLLC may provide for its governance, in whole or in part, through blockchain technology."[24] However, Vermont imposes certain requirements, namely that the BBLLC shall "provide a summary description of the mission or purpose of the BBLLC" in the operating agreement.[25] This begs the question whether or not the operating agreement for the DAO would need to be amended if the DAO becomes capable of performing some purpose other than the one originally defined in the operating agreement. Yet the point of that requirement may indicate that the Vermont legislature contemplated only one purpose for a DOA because DAOs, traditionally, are reduced to immutable code on a blockchain.

b.      Wyoming

In 2021, Wyoming became the first state to expressly identify DAOs as a corporate form.[26] For Wyoming, the DAO is merely an LLC with a few extra requirements.[27] However, unlike the Vermont statute, in Wyoming, the "[a] decentralized autonomous organization may form and operate for any lawful purpose, regardless of whether for profit"[28] and the statute is silent as to a statement of purpose. Issues related to changing the purpose of the DAO comes under the standard Wyoming LLC provisions. Consequently, it does not appear that the original Wyoming legislature considered the situation in which a DAO adds additional code to itself, and thus amend its business model without human intervention. That changed, however, in 2022.

"In 2022, Governor Gordon signed amendments[29] to the Supplement Act, which sought to clarify some of the aspects of DAOs that did not initially fit clearly into LLC policy."[30] The amendments specified that DAOs could be 'member managed,' 'algorithmically managed,' or otherwise operate and require 'any smart contract utilized by a DAO to be capable of being updated, modified or otherwise upgraded,' among other things."[31] With this amendment, Wyoming opens the door for AI-enabled DAOs to update or otherwise modify the DAO to adopt different business models. While an improvement over the original statute, for some that amendment was insufficient.

Consequently, in 2024 Wyoming went one step farther and enacted the Decentralized Unincorporated Nonprofit Association Act ("WyDUNA"), which went into effect on July 1, 2024.[32] In general, an "unincorporated association" is defined as "an unincorporated group of two or more persons joined by mutual consent for a common lawful purpose, whether organized for profit or not."[33] The WyDUNA, extended some of the above-mentioned protections that Wyoming had already extended to LLCs mentioned above, but this time to another entity type, namely the non-profit unincorporated association ("UA"), thus making a the first enacted "DUA" statute. Other states are seeing similar DUA bills filed in their respective legislatures.[34]

c.     Tennessee

On April 20, 2022, Tennessee became the second state to enact a DAO-oriented corporate form.[35] The Tennessee statute provides a basic framework for creating a DAO under the state's law. A DAO, following the Tennesee framework, will be able to offer its members the same limited liability protections afforded to a traditional LLC. In summary:

- At least one member must sign and deliver the articles of organization to the secretary of state for filing. The person forming the decentralized organization does not need to be a member of the organization.

- The governing documents of a DAO must contain a statement that "the company is a decentralized organization."

- Alternatively, DAOs may be formed as LLCs and later be converted to a DAO through an amendment to the LLC's articles of organization.

- Certain notices regarding potential restrictions on duties and transfers in a DAO, and how those restrictions may be materially different from those in an LLC, are required to be included in the organizational documents.

- The registered name for a DAO must include the term "DO", "DAO", "DO LLC" or "DAO LLC" to note its status as a decentralized organization.

- The DAO's articles of organization must define whether it is a "member-managed" or "smart contract-managed" DAO. If a DAO is not specified to be smart contract managed, the presumption will be that the DAO is member-managed. The smart contract, if applicable, must be capable of being amended, and a publicly available identifier of a

smart contract directly used to manage, facilitate, or operate the decentralized organization must be included.

- The DAO must be based inside the United States and its territories.

The Tennessee DAO act itself is silent as to purpose (or changed-purpose), instead relying on the stadard LLC statute.[36]  Consequently, it does not appear that Tennessee contemplated a situation in which a DAO could write new code and, in an automated fashion, amend its purpose without human intervention.  However, as the Tennessee law is silent as to purpose, perhaps it does not matter that the DAO can morph itself into multiple and/or different businesses.  That question may have to be litigated in the future.

### d.    Utah

As of January 1, 2024, Utah became the fourth state to enact a corporate form specifically for DAOs by amending its Decentralized Autonomous Organization Act.[37]  Section 48-5-104 of the statute regarding legal personality of the DAO specifically provides that the DAO "may have any lawful purpose..."[38]  However, the Utah statute (as with other states) defines a "Developer" as "a person involved in the development or maintenance of a decentralized autonomous organization."[39]  Consequently, the AI-enabled DAO could be its own Developer, but it is unclear that the Utah legislature contemplated such a scenario.

### e.    New Hampshire

New Hampshire is the most recent jurisdiction to create DAO/LLC legislation with the "New Hampshire Decentralized Autonomous Organization Act."[40]  Governor Christopher Sununu signed the bill and the new DAO law will go into effect on July 1, 2025.  The bill is extensive, but satisfies two general results: 1) it "[e]stablishes regulations and the legal framework and operational guidelines for decentralized autonomous organizations (DAOs) in the state"; and 2) "[c]overs provisions on judicial deregistration, forks in blockchains, restructuring, failure events, and the application of general business organization law and other relevant laws."[41]  The law will state that "[a] New Hampshire decentralized autonomous organization may be registered under this chapter for the purpose of carrying on any lawful activity within or outside this state."[42]  With respect to the purpose of the DAO, the bill provides that the "DAO shall have bylaws that set forth the purposes, powers, rules and procedures for the internal organization…"[43]  More importantly, it also requires that the "bylaws shall accurately reflect the rules, terms, instructions and conditions of the software code that governs the smart contracts and permissionless blockchain network of the New Hampshire DAO, including the rules and regulations that govern the procedures followed by the New Hampshire DAO and the interaction of its participants, administrators and legal representatives."[44]  The New Hampshire legislature was contemplating that the code making up the DAO be static, rather than dynamic, unless the DAO was able to (without a vote of the membership) be able to amend its bylaws to reflect the alternative business model.

### f.    A Different Approach

David Kerr and Miles Jennings have put forward a proposal for a different form of corporate formation for DAOs. They have written a fairly expansive mini-treatise on DAOs in three parts: an introduction,[45] entity selection,[46] and a model act.[47] While the mini-treatise focuses on the taxation of DAOs, it uses *unincorporated associations* as the model corporate for, rather than LLCs. That effort, presumably, led to the WyDUNA.[48] A similar bill was filed during the last session of the Texas Legislature. In both cases, the emphasis for both bills was on the character of the unincorporated associations rather than taxation.

g.      Texas (proposed)

A bill that is similar to the WyDUNA was introduced (and failed) in Texas during its last legislative session.[49] Like WyDUNA, the Texas bill ("TxDUNA") would have created a specific DAO for "unincorporated associations" **only**. It is instructive to review how Texas defines and treats an unincorporated association. According to the Texas Secretary of State:

> A "nonprofit association" is defined as an unincorporated organization, other than one created by a trust, consisting of *three* or more members joined by mutual consent for a common, nonprofit purpose. A form of joint tenancy, tenancy in common, or tenancy by the entirety does not by itself establish a nonprofit association, regardless of whether the co-owners share use of the property for the nonprofit purpose (BOC § 252.001(2)). Under Chapter 252, an unincorporated nonprofit association is treated for certain issues as a separate legal entity as opposed to an aggregate of individuals."[50] (emphasis added)

Interestingly, rather than amending Chapter 252, the TxDUNA bill would have added a specific chapter (253) for the DUNA. While the DUNA itself adopts much of the definition of the "unincorporated association" under Chapter 252, a TxDUNA would have had a significantly larger membership requirement than a standard unincorporated association (one hundred, versus three). Under § 252.001(3) the TxDUNA bill, the:

> "Decentralized unincorporated association means an unincorporated association:
> (A)      consisting of at least *100* members joined by mutual consent under an agreement, that may be in writing or inferred from conduct, for a common nonprofit purpose;
> (B)      that has elected to be formed under this chapter; and
> (C)      is not formed under any other statute governing its organization and operation." (emphasis added)

In addition, the TxDUA bill included a provision stating that "established practices" could affect the "governing principles" of the DUNA. Under § 253.001(4) of the TxDUNA bill:

> "Established practices" means the practices used by a decentralized unincorporated association without material change during the most recent five years of the association's existence, or if the association has existed for less than five years, during its entire existence.

This is an interesting provision because it (perhaps inadvertently) presupposes two types of practices: (1) "established practices"; and (2) practices that, for whatever reason, haven't become established. Moreover, governing principles do not have to be established practice. Under § 253.001(5) the TxDUNA:

> "Governing principles" means all agreements and any amendment or restatement of those agreements, including any association agreements, consensus formation algorithms, or enacted governance proposals, that govern the purpose or operation of a decentralized unincorporated association and the rights and obligations of the association's members and administrators, whether contained in a record, implied from the association's established practices, or both.

Thus, the bill clearly anticipates "agreements" that "govern the purpose or operation" of the DUNA, yet those agreements would have to be "contained in a record" because there would be no "established practices" for an AI-enabled DUNA.

However, there is some (unintended) hope for the DUNA because of the bill defines "member" as:

> "Member" means a person that, under the governing principles of a decentralized unincorporated association, may participate in:
> (A) the development of the policies and activities of the association; and
> (B) the selection of the association's administrators.[51]

So long as the AI is considered a "person," then the AI could be a participating member of the association, even be the sole member that develops activities ("business models") for the association. That's a stretch, and I doubt that that scenario was contemplated by the drafters of this bill, but that issue is beyond the scope of this paper.[52]


IV.     Discussion

Taxation affects both LLCs and UAs. Moreover, the technical solution for taxation exists already for both LLCs-based DAOs and DUNAs,[53] so the emphasis on taxation by Kerr and Jennings in their mini-treatise does not explain their emphasis on UAs. My best guess is that their emphasis on UAs has more to do with the ease of entry and exit by a member of an unincorporated association versus an LLC. Given the nature of DAOs, and how easy it would be to transfer governance tokens that confer voting rights in the DAO, a UA notion of membership seems to be a better fit for a DAO than membership in an LLC. If that is indeed the case, then I will probably see more DUA- or DUNA-type legislation in the future. Wyoming has generally satisfied the need for an LLC that is DAO-friendly.

While not an existential threat, combining a DAO with AI is one of those technologies that offers significant potential benefits and significant potential harms. Currently, AI cannot distinguish between right and wrong (but it can be told to avoid outcomes that the developers know is

wrong, but only if those developers can know and accommodate the wrong beforehand).  GAs merely to see if some course of action is more "fit" than some other course of action.[54] Generally, a human-led for-profit corporation's "fitness" is determined by the amount of money that it generates for shareholders and, hopefully, by whether the activities of the corporation are legal.  Unfortunately, when a GA applies the same standard, it ignores whether or not the fitness for that business model is legal, let alone beneficial.  This latter point is important because the DAO that can act as a "developer" to maintain itself and to create new DAOs extends the capabilities of humans, particularly those who are not adept themselves at coding.

Nevertheless, an AI-led DAO clearly has benefits because it gives less technically-adept investors the opportunity to improver their returns, and thus help democratize the investment community and widen the reach of DAOs.  The technology is not inherently bad.  Rather, legislators can and perhasps should require that developers to account for certain activities, and develop the AI accordingly.

The mere fact that AI-enabled DAOs exist today,[55] and DAOs empowered with AI can conduct "cross-DAO collaboration"[56] in ways that may be unforeseen by their (human) developers.  For example, can an AI-enabled DAO be a member of another DAO, and thus affect what the second DAO is allowed to do via the standard DAO governance mechanism that the legislation *did* contemplate (but assumed only humans would be participants)?[57]  For that matter, have legislators contemplated whether it is appropriate idea to have AI agents (which have existed for several years) be allowed to participate in a DAO?[58]

I admit that what goes to the heart of a DAO is necessarily technology-specific, and as such is rarely the subject of legislation.  For example, when using GAs, the legislation could generally focus on the fitness function.[59]  Because of the importance of the fitness function, additional liability that could be imposed (or removed risk therefrom) should be a central focus of legislative efforts.  However, this would only be applicable to GA-based DAOs, and would not be applicable to AI-led DAOs that employ a different technology.  This diversity in the application of disparate AI technology complicates the legislative effort.  Likely, the only solution would be to have technology-tailored legislation, which heretofore has been an anethma, but now seems unavoidable.

What is clear is that legislation, to date, has not contemplated the capabilities of an AI/DAO combination (regardless of the AI technology).  Vermont may have precluded AI/DAO innovations by some of its BBLLC requirements,[60] but that was most likely accidental.  Perhaps Vermont wants to keep the current provision, perhaps not.  However, states like Texas and others that have yet to address the issue of whether DAOs should be allowed to self-develop should bring the issue to light.  The point is that AI-enabled DAOs exist, and the technology will persist. It is up to legislatures to decide whether to regulate the technology, and to what extent.  Texas has a golden opportunity to shape the space for AI-led DAOs.


V.      Conclusion

The convergence of AI and DAOs has the potential to revolutionize the way organizations operate. By integrating AI algorithms with decentralized governance models, DAOs can become more agile, adaptive, and efficient. As AI technologies continue to advance, I can expect to see more innovative applications of AI-enabled DAOs in various industries.

In this article, I have explored the intersection of artificial intelligence and distributed autonomous organizations, identifying the potential benefits and potential pitfalls of integrating these two technologies. By applying genetic algorithms and other AI techniques to smart contracts, DAOs can unlock new possibilities for decision-making, contract optimization, and organizational evolution. The confluence of newer technologies makes it essential that legislation contemplate innovative technologies like AI and DAOs in a way that, if deemed necessary, regulates the ability of a DAO to self-develop.

However, existing law and pending legislation is silent as to AI/DAO entities.  While the silence may be innocent, the implications for companies and the public are significant because unintended consequences are likely, and compliance with existing laws may prove difficult.[61] Conversely, future legislation that contemplates the allowance (or preclusion) of AI-enabled DAOs may attract more business to that jurisdiction.  Wyoming, perhaps by accident, may be that jurisdiction.

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[2] *How to navigate tax and legal complexity associated with DAOs* (Ernst & Young Global Ltd., August 2, 2023), https://www.ey.com/en_gl/insights/tax/how-to-navigate-tax-and-legal-complexity-associated-with-daos.  The authors of that article observe that "[l]ack of DAO-specific regulation is creating legal and tax risk", and claim that "[c]ommercial DAO use cases have far outpaced tax policy and legislation."  The authors suggest that "a legal partnership" is a "great starting point" for a legal framework to address the problems, but admit that some type of legal centralization is necessary but argue that such a "legal wrapper" should be constructed in such a way as to preserve, to the extent possible, the decentralized nature of DAOs.

[3] For a short definition of determinative, *see,* https://www.merriam-webster.com/dictionary/determinative.

[4] For a more detailed (but still general) explanation of AI, *see, e.g.,* IBM, *What is Artificial Intelligence?* (IBM Website), https://www.ibm.com/topics/artificial-intelligence.  For an expansive and detailed explanation of AI, see Stuart Russell and Peter Norvig, ARTIFICIAL INTELLIGENCE: A MODERN APPROACH (4th ed., 2023).

[5] *See, e.g.,* Grunitz, Mario, *Rule-based AI vs machine learning: what's the difference?* (WeAreBrain blog, September 13, 2021), https://wearebrain.com/blog/rule-based-ai-vs-machine-learning-whats-the-difference/.

[6] *See, e.g.,* Sohrabi, Shirin; Katz, Michael; and Udrea, Octavian, *AAAI 2022 Tutorial on AI Planning: Theory and Practice,* https://aiplanning-tutorial.github.io/.

[7] *See, e.g., What is machine learning (ML)?* (IBM), https://www.ibm.com/topics/machine-learning.

[8] *See, e.g., Genetic Algorithms in AI* (Deepgram, June 16, 2024), https://deepgram.com/ai-glossary/genetic-algorithms; and *Traveling Salesman Problem (TSP) Implementation* (Geeks for Geeks blog, January 31, 2023), https://www.geeksforgeeks.org/traveling-salesman-problem-tsp-implementation/.

[9] *See, e.g., What is Deep Learning? A Tutorial for Beginners* (Datacamp, October, 2023), https://www.datacamp.com/tutorial/tutorial-deep-learning-tutorial.

[10] *See, e.g.,* Nathan Reiff, *Decentralized Autonomous Organization (DAO): Definition, Purpose, and Example* (Investopedia, May 17, 2024), https://www.investopedia.com/tech/what-dao/; and Gail Weinstein, *et al., A Primer on DAOs* (Harvard Law School Forum on Corporate Governance, September 17, 2022), https://corpgov.law.harvard.edu/2022/09/17/a-primer-on-daos/.

[11] *See, e.g.,* Ethereum, *Decentralized autonomous organizations* (Ethereum website), https://ethereum.org/en/dao/

[12] *See, e.g.,* Philemon Poux, *What are Blockchain-Based Platform Cooperatives?* (Platform Cooperativesm Consortium, May 12, 2022), https://platform.coop/blog/what-are-blockchain-based-platform-cooperatives/

[13]  Rickard, Matt, *Smart Contract Immutability,* (July 8, 2022), https://blog.matt-rickard.com/p/smart-contract-immutability. ("Smart contracts deployed to Ethereum are, in theory, immutable. Bytecode is uploaded, a constructor function is executed, and the resulting code is stored on the blockchain and cannot be updated.")

[14]  *Id.  See also,* @nhsz, *Upgrading Smart Contracts* (Ethereum Developers Documentation, August 15, 2023), https://ethereum.org/en/developers/docs/smart-contracts/upgrading/.

[15] Examples can be see with the DAO Hub, at https://daobase.ai/.

[16] MathWorks, *What Is a Genetic Algorithm?* (MathWorks) https://www.mathworks.com/discovery/genetic-algorithm.html; Mehrdad Dianati, et al., *An Introduction to Genetic Alogorithms and Evolution Strategies* (Univ. of Cincinnati, 2018), https://www.ceas3.uc.edu/ret/archive/2018/ret/docs/readings/Project%203/2018RET_ReadingMaterial_Introduction%20to%20Genetic%20Algorithms.pdf.

[17]  Elliot Meyerson, *Simple Genetic Operators are Universal Approximators of Probability Distributions (and other Advantages of Expressive Encodings),* https://arxiv.org/pdf/2202.09679.

[18] *See, e.g.,* Daniel Bron, *The Role of AI in Decentralized Autonomous Organizations (DAOs): From Governance to Decision-Making* (Linkedin, February 22, 2023), https://www.linkedin.com/pulse/role-ai-decentralized-autonomous-organizations-daos-from-daniel-bron.

[19] *See, e.g.,* Samantha Marin, *The Future of DAOs is Powered by AI* (Aragon Blog, January 19, 2023), https://blog.aragon.org/ai-daos-the-future-of-daos-powered-by-artificial-intelligence/; Guneet Kaur, ed., "How DAO's can

leverage AI for enhanced dynamics" (Cointelegraph, January 18, 2024), https://cointelegraph.com/learn/how-daos-can-leverage-ai-for-enhanced-dynamics; Marcello Mari, *DAOs: Where humans may fail, AI could succeed* (Cointelegraph, February 6, 2022), https://cointelegraph.com/news/daos-where-humans-may-fail-ai-could-succeed; *AI market making: How does Reform leverage AI?* (Reform DAO, 2024), https://docs.reformdao.com/overview/ai-market-making; Andrew Fenton, *Real AI use cases in crypto, No. 2: AIs can run DAOs* (Magazine by Cointelegraph, November 28, 2023), https://cointelegraph.com/magazine/real-ai-use-cases-crypto-no-2-ai-can-run-dao/; Financial Sense, *How AI-Led DAOs Will Cause and 'Industrial Revolution'*, (Financial Sense, April 3, 2024), https://www.financialsense.com/blog/20865/how-ai-led-daos-will-cause-institutional-revolution; XDAO, *AI and DAO: Designing New Patterns for a Better Future* (Medium, XDAO Blog, February 20, 2023), https://blog.xdao.app/ai-and-dao-designing-new-patterns-for-a-better-future-55a4a116a79e; Ngozi-Olehi Munachimso, *AI DAOs: The Future of DAOs & Blockchain? (II)* (Medium, January 30, 2022), https://medium.com/@munaolehi/ai-daos-the-future-of-daos-blockchain-ii-d60796719d1e.

[20]  Shakow, David J., *The Tao of The DAO: Taxing an Entity That Lives on a Blockchain* (2018).  All Faculty Scholarship. 2009.  https://scholarship.law.upenn.edu/faculty_scholarship/2009.  *See also*, Zac McClure and Arthur Teller, *Guide to DAO Taxes in 2024* (TokenTax, December 14, 2023), https://tokentax.co/blog/crypto-taxes-for-daos (citing Tynisa Gaines and Zac McClure, *Crypto Taxes 2024: The Complete Guide* (TokenTax, July 9, 2024), https://tokentax.co/blog/tax-rates-for-cryptocurrency).

[21]  *See, e.g.,* Weinstein, Gail, et. al., *A Primer on DAOs* (Harvard Law School Forum on Corporate Governance, September 17, 2022), https://corpgov.law.harvard.edu/2022/09/17/a-primer-on-daos/.

[22]  *See*, 11 V.S.A. § 4173.

[23]  The Vermont BBLLC law was enacted in 2017.  The first "notable" DAOs launched in 2015, so Vermont could have used the DAO vernacular, but didn't elect to do so.  *See*, Minaev, Artem, *A Complete History of DAOs (1960s – Now)* (CryptoDose, updated June 28, 2023), https://cryptodose.net/learn/history-of-daos/ ("A 'DAO – Decentralized Anonymous Organization' term was invented (coined) by Vitalik Buterin in 2013.")

[24] 11 V.S.A. § 4173(1).

[25] 11 V.S.A. § 4173(2)(A).

[26] *See,* W.S. 17-31-101 (the "Wyoming Decentralized Autonoouos Organization Supplement").  W.S. 17-31-102(a)(ii) '"Decentralized autonomous organization" means a limited liability company organized under this chapter'.

[27] W.S. 17-31-104(a) "A decentralized autonomous organization is a limited liability company whose articles of organization contain a statement that the company is a decentralized autonomous organization as described in subsection (c) of this section."  "The articles of organization of a decentralized autonomous organization shall include a statement that the organization is a decentralized autonomous organization, pursuant to W.S. 17-31-104, and shall set forth the matters required by W.S. 17-29-201."  W.S. 17-31-106(a).  The DAO must be under the control of at least one natural person.  *See* W.S. 17-31-114 (Dissolution.  "The decentralized autonomous organization no longer performs a lawful purpose or is no longer under the control of at least one (1) natural person").

[28]  W.S. 17-31-105(c).

[29]  *See*, Wyoming Senate Bill SF0068 https://www.wyoleg.gov/Legislation/2022/SF0068.

[30]  Wagner, Casey, "Wyoming passes law to give DAOs a nonprofit legal framework" (Blockworks, March 8, 2024), https://blockworks.co/news/wyoming-non-profit-dao-legislation.

[31]  *Id.*

[32]  *See*, SF0050, https://wyoleg.gov/Legislation/2024/SF0050?ref=daotimes.com.

[33]  *See, e.g.,* Fishman, Stephen, "What Is An Unincorporated Nonprofit Association?" (Nolo), https://www.nolo.com/legal-encyclopedia/what-an-unincorporated-nonprofit-association.html; and The Law Dictionary, https://thelawdictionary.org/unincorporated-association/ ("This term is applied to a group of people who act together in a common enterprise and for a common purpose.")

[34]  *See, infra* the discussion on HB 3768 in Texas.

[35]  *See*, Tenn. Code Ann 48-250-101 et. Seq.

[36]  *See, generally,* Tenn. C. § 48-212-101. General powers, https://law.justia.com/codes/tennessee/2019/title-48/limited-liability-companies/chapter-212/section-48-212-101/.

[37]  Utah 48-5-101, *et. seq.  See* Utah H.B. 357 of the 2023 General Session, https://le.utah.gov/~2023/bills/static/HB0357.html; and Utah Code 48-5-101, *et. seq*. https://le.utah.gov/xcode/Title48/Chapter5/C48-5-P1_2023050320240101.pdf.

[38]  Utah Code 48-5-104(4).

[39]  Utah Code 48-5-191(7)(a) and (b)(i).

[40]  New Hampshire HB 645 Fn, available at https://le.utah.gov/~2023/bills/static/HB0357.html.

[41]  N.H. HB 645 FN Amended Analysis.  *See*, the text as amended by the Senate, https://legiscan.com/NH/text/HB645/id/2998157/New_Hampshire-2024-HB645-Amended.html.

[42]  HB 645 FN, 301-B:4  Organization; Purposes.

[43]  HB 645 FN, 301-B:16(I) Bylaws.

[44]  HB 645 FN, 301-B:16(II) Bylaws.

[45]   Kerr, David and Jennings, Miles, *A Legal Framework for Decentralized Organizations* [Part I] (June, 2022).  Available at: https://api.a16zcrypto.com/wp-content/uploads/2022/06/dao-legal-framework-part-1.pdf.

[46]   Jennings, Miles and Kerr, David, *A Legal Framework for Decentralized Autonomous Organizations – Part II: Entity Selection Framework* (June, 2022).  Available at: https://api.a16zcrypto.com/wp-content/uploads/2022/06/dao-legal-framework-part-2.pdf.

[47]   Kerr, David and Jennings, Miles, *A Legal Framework for Decentralized Autonomous Organizations - Part III: Model Decentralized Unincorporated Nonprofit Association Act* (March 5, 2024). Available at SSRN: https://ssrn.com/abstract=4749245 or http://dx.doi.org/10.2139/ssrn.4749245.

[48]  *See supra,* note 24.

[49]  *See* HB 3768 for the 88th Session of the Texas Legislature. https://capitol.texas.gov/tlodocs/88R/billtext/html/HB03768I.htm

[50]  Tex. Sec. of State, *Information on Unincorporated Nonprofit Associations Under the Texas Business Organizations Code*, https://www.sos.state.tx.us/corp/forms/208_boc.pdf.

[51]  HB 3768 § 253.001(6).

[52]  *See, e.g.,* Lance Eliot, *Legal Personhood For AI Is Taking A Sneaky Path That Makes AI Law and AI Ethics Very Nervous Indeed* (Forbes, November 21, 2022), https://www.forbes.com/sites/lanceeliot/2022/11/21/legal-personhood-for-ai-is-taking-a-sneaky-path-that-makes-ai-law-and-ai-ethics-very-nervous-indeed/; Nergi, Sergio M.C. Avila, *Robot as Legal Person: Electronic Personhood in Robotics and Artificial Intelligence*, Front. Robot. AI, December 22, 2021, https://www.frontiersin.org/journals/robotics-and-ai/articles/10.3389/frobt.2021.789327/full; Kurki, Visa AJ, *A Theory of Legal Personhood*, Oxford Legal Philosophy (Oxford, 2019; online edn, Oxford Academic, 19 Sept. 2019), https://doi.org/10.1093/oso/9780198844037.001.0001, accessed 21 June 2024. For a different view of AI (more from a computer scientist standpoint), *see* Hildebrandt, Mireille, *Law for Computer Scientists and Other Folk* (Oxford, 2020; online edition, Oxford Academic, 23 July 2020), https://doi.org/10.1093/oso/9780198860877.001.0001, accessed 25 June 2024, which is instructive for lawyers and legislators who want to understand how the developers would interpret the statutes that lawyers write.

[53]  For example, oracles could be used as an intermediary between the tax authority and the DAO.

> "Oracles provide a way for the decentralized Web3 ecosystem to access existing data sources, legacy systems, and advanced computations. Decentralized oracle networks (DONs) enable the creation of hybrid smart contracts, where onchain code and offchain infrastructure are combined to support advanced decentralized applications (dApps) that react to real-world events and interoperate with traditional systems."  Chainlink, *What is a Blockchain Oracle?* (Chainlink, January 12, 2024), https://chain.link/education/blockchain-oracles.

A government sanctioned oracle could be used to exchange information from a government entity (such as a tax authority) to the DAO, and to receive the response (such as a report) or tokens from the DAO.  Thus, a hybrid of centralized authority yet preserve (to the extent possible) the decentralized nature of DAOs.

[54]  In the context of Genetic Algorithms ("GAs"), "fitness" refers to a measure that evaluates the quality or suitability of a candidate solution, also known as an individual or chromosome, within a population of potential solutions.  Fitness is a crucial component of GAs because it allows the algorithm to determine which individuals in the population are more likely to contribute to the evolution of better solutions.  In other words, fitness serves as a guide for the selection process, where the fittest individuals are more likely to be chosen as parents for the next generation.  Fitness is a vital component of Genetic Algorithms, as it guides the search process, encourages exploration, reduces convergence to local optima, and allows for adaptation to changing conditions. A well-designed fitness function can significantly improve the performance and effectiveness of GAs in solving complex optimization problems.

[55]  *See, e.g.,* the SingularityDAO DeFi Hub, an "AI-Powered Portfolio Management for Optimized Yields", https://singularitydao.ai/; and the DAO Hub, https://daobase.ai/.

[56]  *See,* James Young, *How AI Enables a New Era of Cross-DAO Collaboration* (Nasdaq, May 12, 2023), https://www.nasdaq.com/articles/how-ai-enables-a-new-era-of-cross-dao-collaboration.

[57]  *See, e.g.,* ChainGPT, *AI DAO Members; Autonomous Agents of Distributed Coordination* (Medium, August 31, 2023), https://medium.com/chaingpt-blog/ai-dao-members-autonomous-agents-of-distributed-coordination-4589bcec7249.

[58]  *See, e.g.,* Biddwan Ahmed, *AI agents – Types, benefits, and examples* (Yellow.ai, June 5, 2024), https://yellow.ai/blog/ai-agents/; Miguel Rebelo, *"What are AI agents? A comprehensive guide"* (Zapier, May 17, 2024), https://zapier.com/blog/ai-agent/.

[59]  *See supra,* note 55.

[60]  *See supra,* Section 6(a).

[61]  *See, e.g.,* the Corporate Transparency Act; and *Fact Sheet: U.S. Department of the Treasury Actions to Prevent and Disrupt Corruption* (U.S. Dept. of Treasury website, December 11, 2023),

https://home.treasury.gov/news/press-releases/jy1974.