Decentralized Autonomous Organization: Is it the corporate future?

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Abstract

Technology has played an instrumental role in the evolution of the business world. A striking example of this phenomenon is the autonomous system, which in turn has contributed to the emergence of decentralised autonomous organisations: DAOs.

This recent trend, Decentralized Autonomous Organizations, have the potential to radically revolutionize organization and governance. DAOs are blockchain-native, decentralized organizations that are cooperatively owned and governed by their members using smart contracts. Overall, DAOs have the power to shape the future age in organizational economics, shifting the global business landscape from hierarchical to democratic and distributed organizations, powered by organizational entrepreneurship and innovation. This means that it has the capacity to function totally autonomously, without the need for a central authority, thus providing an operating system for open collaboration. This innovative operating system allows individuals and institutions to collaborate without having to know or trust each other. Moreover, the emergence of this new, fully decentralised system is causing a stir in the corporate world, creating a lot of interest in how it works, but also several concerns about its possible effective regulation at a global level.

Key words: DAO, blockchain, decentralized autonomous system, regulation, smart contract, disintermediation, technology.

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Introduction

Technological evolution is disrupting today's society in many areas, especially in the corporate sector. Thanks to new technologies, new types of organisations operating in a decentralised manner compared to traditional societies have emerged. The most talked-about breakthrough in the digital revolution of the economy and society is distributed-ledger technology[1]. It opens a large area of novel applications and completely new types of cooperation because to qualities like decentralization, dependability, and anti-counterfeiting. Large blockchain-based ecosystems and projects point to a future in which online groups coordinate at eye-level and possibly pseudonymously, relying fully or almost entirely on software. The phrase "decentralised autonomous organization" describes the growth of entirely digitally existing decentralised organizations that operate independently without traditional leadership and hierarchy (DAO).[2]

Decentralised autonomous organization (DAO), also referred as decentralised autonomous corporation (DAC), is a type of organization whose operations and executive power are obtained and maintained through defined rules, such as smart contracts, which are computer programs. Smart contracts are computer protocols that facilitate, verify, or enforce contract negotiation and execution, allowing for the partial or complete elimination of contractual clauses. Smart contracts often include a user interface and mimic the logic of contractual agreements. A blockchain-like database stores DAO financial transactions and program rules.[3] The blockchain is a distributed, "immutable" data structure. It's a digital ledger with entries organized into 'blocks,' concatenated in chronological order, and the integrity of which is ensured by cryptography.[4] Although its size will increase over time, its premise remains unchanged. Its content, once written using a regulated method, cannot be changed or deleted without invalidating the entire process. Systems based on a distributed ledger that may be read and modified by various nodes in a network are included in the broader Distributed Ledger

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[1] Sk. Md. Mizanur Rahman & Ahad ZareRavasan, *Distributed Ledger Technology Review and Decentralized Applications Development Guidelines*, (Febr. 2021).

[2] E. S. Kim, *A legal study on the acceptance of blockchain and distributed ledger technologies on business*, IT & LAW REVIEW (Online), *at 16,* 121-146, (2018).

[3] Rodrigues, U. R. , *Law and the Blockchain*, IOWA L. REV, *104*, 679, (2018).

[4] Id ("The blockchain makes use of asymmetric cryptography to allow for the exchange of goods (such as cryptos) between two people. Every person who stores a good (of any kind) on the blockchain has two keys: a public key (also known as a "address") and a private key.

family. Because the creation of a new block is governed by a shared protocol, the nodes involved do not need to know each other's identities or trust each other to assure consistency across the various copies. Each node updates its private copy after the insertion of the new block has been approved. The data structure's fundamental nature ensures that it cannot be altered in the future. Digitalization of data, decentralization, disintermediation, traceability of transfers, transparency/verifiability, register immutability, and programmability of transfers are all properties shared by systems established with blockchain and Distributed Ledger technology. Because of these characteristics, blockchain is seen as a viable alternative to databases and registries controlled centrally by recognized and regulated bodies in terms of security, reliability, openness, and cost.

This thesis illustrates and analyses DAOs and their importance, which may become even more relevant in the corporate future. The study begins with a detailed analysis of the role that technology has played in the corporate sector, the difference between modern organizational entities from traditional types of business organizations, and how the first autonomous systems were created. The second part is dedicated to describing the concrete meaning of DAOs, all the tools and technologies that need to be considered and understanding how they work to deal with such organizations. In addition, there is an argumentation on the regulation of DAOs, which is currently a source of debate, given the lack of unanimity on the possible effective functioning of such organizations. The main obstacle to such regulation arises from the fact that there is no single legal structure for DAOs, nor is there a single governance mechanism for them. A functioning governance structure is mandatory for these decentralised organisations, while the formulation of a legal structure is not strictly necessary, given the digital nature of the transactions carried out by such entities. Moreover, being based on developing technologies, this type of entity does not foresee a certain future and for this reason some jurisdictions are still far behind in the development of appropriate regulation.

Although technology is evolving faster than the corporate sector, there are some jurisdictions that are already interfacing with such entities. The glaring case in point, discussed in chapter three along with the case of Delaware and Vermont, is the state of Wyoming, which on 1 July 2021 officially granted legal recognition to DAOs incorporated in the country. With this law, the state of Wyoming bridged the gap between traditional association-based entities and other forms of partnership, whose advantages it borrows, namely limited liability for participants and the adoption of informal procedures in decision-making. Advantages considered acceptable in view of the transparency that the structure ensures, thanks to the underlying technology. This step forward by the legal system is seen by many as only the beginning of a new corporate era. There are also many doubts about the

functioning of the DAO and the implications the nature of its operation might cause. Although it is not yet possible to determine exactly where this innovation in the corporate field will lead to, DAOs are the application of an evolution that is already shaking up today's economic, digital, legal and corporate sector and has high probability of growth.

I. AI and memberless entities

A. The instrumental role of technology in corporations

The prototypical business entity has historically been a corporation; common law has long permitted business to be organized in non-corporate forms[5], but it was only recently that those forms were conceived of as legal entities or legal persons. Governments charted companies for specific, limited purposes in the beginning; a common example is the construction of a bridge.[6] These narrowly tailored business were unable to penetrate new markets or adjust to rapidly evolving business conditions. Clearly, the corporation's narrowly oriented historical structure does nothing to help an autonomous system seeking legal personhood. Having a modern government to issue a customized charter would almost certainly be as difficult as getting a modern government to accept an independent autonomous structure as a legal entity in the first place. However, companies, at least as they have historically been conceived, enforce other restrictions that are just as important for our purposes as the restrictions in a charter, and these restrictions have remained relevant even as

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[5] Shawn Bayern, *Are autonomous entities possible?,* 114 Nw. U. L. Rev. Online 23 (2019), ("A non-corporate entity is a legal entity that does not go through the incorporation process. Shareholders possess certain responsibilities and rights that owners of other legal entities do not have. Sole proprietorship or partnerships are non-corporation businesses that have no legal separation from the business owners. Non-corporations are simpler to set up due to the lack of fees to pay or papers to file to begin operation. Shareholders, directors, and officers must be set in a specific structure").

[6] Id, The prominence of the bridge-building example in American commentary may date to Proprietors of Charles River Bridge v. Proprietors of Warren Bridge, 36 U.S. 420, 423 (1837) (involving "a corporation created by an act of the legislature of the state of Massachusetts, passed on the 9th of March 1785, entitled 'an act for incorporating certain persons for the purpose of building a bridge over Charles River, between Boston and Charlestown, and supporting the same, for forty years.'").

corporations' power[7] to conduct general business has grown. One limitation of the historical corporate form, for example, is that the company be governed (or at least overseen)[8] by a board of directors, which must be made up of natural persons.[9]

Corporate law became more versatile in terms of the allowable underlying structures of companies starting around the mid-1900s.[10] To meet the needs of privately held companies — "ranging from family businesses to joint ventures owned by large public corporations"[11] — courts began to allow unanimous shareholders to impose extreme restrictions on a corporation's board of directors, replacing flexible, statutorily undefined governance with private agreement.[12] State statutes eventually gave unanimous shareholders more overt control. The modern Model Business Corporation Act[13] comes dangerously close to allowing an autonomous system to occupy a corporation and use it as its legal interface. This happens because a legally enforceable agreement may give legal significance to arbitrary features of the state of any process (such as an algorithm or physical system) by specifying legal conditions satisfied by features of that state. A simple bilateral contract[14], for example, might make an obligation contingent on the results of a computer program, the actions of a dog, and so on. The theory that a process and an agreement can conform to one another extends this example by recognizing that a sufficiently large agreement can give an arbitrary process virtually unlimited legal influence.

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[7] *Supra* note 5.

[8] Melvin A. Eisenberg, *Legal Models of Management Structure in the Modern Corporation: Officers, Directors, and Accountants*, 63 CAL. L. REV. 375, 376 (1975) ("Instead [of a managerial board], in small, closely held corporations the business is typically managed directly by owner-managers, while in large, publicly-held corporations. . . the business is typically managed by the top executives.").

[9] *Supra* note 5.

[10] See Id. § 7.32 cmt.

[11] Id.

[12] See Id.

[13] John F. Olson, Aaron K. Briggs, *The model business corporation act and corporate governance: an enabling statute moves toward normative standards, (2002)* ("The Model Business Corporation Act (MBCA) is a model act prepared by the Committee on Corporate Laws of the Section of Business Law of the American Bar Association. In 2002, it was followed by 24 states. The MBCA has been influential in shaping standards for United States corporate law.").

[14] Id ("A contract in which both parties pledge to fulfil their obligations. The promise of one party is used to secure the promise of the other. As a result, each party is an obligor on their own promises and an oblige on the promises of the other.").

The claim is that an agreement, by defining acceptable terms, guarantees, and conditions, may give legal meaning to the operation of any mechanism or system, regardless of its legal personhood.[15] Suppose that an enabler, a natural person, forms a corporation and signs an "agreement"[16] that specifies that the corporation is to have no board of directors and all legal actions are determined by an autonomous system. The company may appear to be used by the autonomous system for its own legal purposes, whatever they may be. This describes how a modern closely held company will enable a self-contained system[17] to approach legal personhood. Even so, the company is not fully an independent legal entity because enabler remains a shareholder and will continue to exert power over the entity.[18] And none of the parties concerned, corporation, autonomous system, or enabler,

seems to be able to completely retire the corporation's shares. Of course, the enabler can transfer the shares — some or all of them — to a new shareholder, but corporate law appears to require at least one shareholder.[19] And shareholders must be legal persons.[20] The result appears to be that even in a modern corporation with a shareholder agreement that eliminates the board of directors, ultimate authority in the corporation must rest with the shareholders. As a result, while a modern company might serve as a convenient way for an autonomous system to behave as though it were a legal individual for a short period of time, any agreement would be contingent on the continued consent of an established private party.[21]

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[15] Wesley N. Hohfeld, *Fundamental Legal Conceptions as Applied in Judicial Reasoning*, 26 YALE L.J. 710 1917(1917) (defining and classifying "jural relations") ("A somewhat more formal definition that conveys a similar message is that a legal person is anything to which the law can ascribe any Hohfeldian jural relation, such as a right, duty, or power.2).

[16] *Supra* note 11 ("The term "shareholder agreement" as used in the Model Business Corporation Act appears to cover single-party operating agreements; at least, nothing in the Act equates "agreement" with "contract" or requires the assent of two or more parties. Even if such a requirement existed, however, it would not change much of the discussion in the text").

[17] Id ("The self-contained system (SCS) is a software architecture method that emphasizes the separation of functionality into many independent systems, resulting in a logical system that is made up of many smaller software systems").

[18] MODEL BUS. CORP. ACT § 7.32(b) (2002) ("An agreement authorized by this section shall be . . . subject to amendment only by all persons who are shareholders at the time of the amendment, unless the agreement provides otherwise . . ..").
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[19] *Id.* § 6.01(b) ("The articles of incorporation must authorize . . . one or more classes or series of shares that together have unlimited voting rights . . . ."). Note that § 7.32(a) of the Act does not include eliminating the notion of shareholders from its list of the capabilities of an enforceable shareholder agreement.

[20] E.g., id. § 1.40(21) ("'Shareholder' means the person in whose name shares are registered . . . ." (emphasis added)).

[21] Id

B. Memberless Entities

To introduce this argument, it might be helpful to distinguish three levels at which an autonomous system may be involved in decision-making of a legal entity:

• Day-to-day management. At this level, an autonomous system would take decisions that would otherwise be taken by human managers and officers.

• Supervision. At this level, an autonomous system would take the role of a board of directors or similar body that supervises an entity's management.

• Members. The third level is the level of those who define an entity's purpose and take fundamental decisions, that is, an entity's founders and, after formation, its members (if any).[22]

The best model for determine whether autonomous companies are admissible is a Limited Liability Company (LLC). The simulation exercise of a *memberless entity* controlled by artificial intelligence has been attempted with greater precision and perseverance through a limited liability company.[23] To explain in more detail what I mean, suppose that a single member operates a member-managed LLC[24] , and entrusts its management to an operating agreement (and hence an algorithm with a verifiable state)[25] that provides for the activities of the LLC to be determined by an autonomous system; further assume that the sole member withdraws from the LLC, which would remain equipped to continue to operate but at the same time would become memberless. The question to be

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[22] S Chopra and LF White, *A Legal Theory for Autonomous Artificial Agents,* UNIVERSITY OF MICHIGAN PRESS 160, (2011).

[23] S. Bayern, *The implications*, cit., p. 101 ss., but previously Id, Of Bitcoins, cit., p. 1496 and again, more recently S. BAYERN, T. BURRI, T. D. GRANT, D. M. HAUSERMANN, F. MOSLEIN, R. WILLIAMS, *Company law and autonomous systems: a blueprint for lawyers, entrepreneurs, and regulators*, in Hast. Sc. Tech. L. J., 9, 2, 2017, p. 135 and S. BAYERN, *Are autonomous entities possible?,* in NW. U. L. Rev., 114, 2019, p. 23.

[24] See § 407 of "Unified Limited Liability Company Act of 2006 (RULLCA), ("depending on whether the administration is compulsorily entrusted to members or not, a distinction is made between member-managed and member-managed LLC.").

[25] *supra* note 5.

asked is whether there is the possibility of admitting the continuity of an LLC at the loss of the members, which would seem legitimate since ""a limited liability company is dissolved, and its business must be liquidated, at the [...] passage of 90 consecutive days during which the company has no members".[26] This norm has not been created as an absolute recognition of a zero member-LLC, but based on an idea of succession, to allow the heirs to evaluate the continuation of the company referable to the deceased; indeed, according to the same norm, after 90 days that no partner has taken over the company it "dissolves". Despite the dissolution of the company, in a given period of time the company continues to exist effectively without directors and members, and if it is assumed that the operating agreement is linked to an artificial intelligence, the LLC will be managed in accordance with the contract and directly by the algorithm during this temporary period. Another point I would like to make is that the RULLCA[27], a model uniform law (not an enacted statute) which regulates the operating agreement, requires various necessary hypothesis in the section dedicated to "dissolution and winding up"[28], but § 701(a)(3) ("the passage of 90 consecutive days during which the company has no members") is not one of them. Even S. Bayern's opinion[29] reflects this observation: the 90-day deadline should not be considered mandatory, as it is not part of the limitations on the negotiating freedom of members prescribed by § 110(c) of RULLCA. The 90-day term should not be considered a mandatory rule; this would result in a longer life for the member less LLC by establishing a longer term in the operating agreement. Regardless, RULLCA is not unique in recognizing memberless entities; there are other reference texts that confirm this observation, such as New York Limited Liability Company Law del 1999 (NYS LLCL), which states that unless the operating agreement requires different terms[30], the corporation does not dissolve if at least one new

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[26] § 701(a)(3) "Unified Limited Liability Company Act of 2006 (RULLCA).

[27] The § 101 of RULLCA regulates the operating agreement and at letter (c) has the following limitations: "An operating agreement may not: (1) vary a limited liability company's capacity under Section 105 to sue and be sued in its own name; (2) vary the law applicable under Section 106; (3) vary the power of the court under Section 204; (4) subject to subsections (d) through (g), eliminate the duty of loyalty, the duty of care, or any other fiduciary duty; (5) subject to subsections (d) through (g), eliminate the contractual obligation of good faith and fair dealing under Section 409(d); (6) unreasonably restrict the duties and rights stated in Section 410; (7) vary the power of a court to decree dissolution in the circumstances specified in Section 701(a)(4) and (5); (8) vary the requirement to wind up a limited liability company's business as specified in Section 702(a) and (b)(1); (9) unreasonably restrict the right of a member to maintain an action under [Article] 9; (10) restrict the right to approve a merger, conversion, or domestication under Section 1014 to a member that will have personal liability with respect to a surviving, converted, or domesticated organization; or (11) except as otherwise provided in Section 112(b), restrict the rights under this [act] of a person other than a member or manager".

[28] (§ 701 e ss.)

[29] S. BAYERN, *The implications*, cit., p. 102.

[30] § 701(a)(4) of NYS LLCL provides that "at any time there are no members, provided that, unless otherwise provided

member joins or is taken over within 180 days of the absence of all shareholders. However, there are several issues regarding the technical side of operating a memberless entity. Over time several techniques have been proposed and idealized to autonomous systems to operate correctly, with the goal of giving software systems the practical capabilities of legal personhood.

Shawn Bayern[31] proposes two similar transactional techniques capable of making it possible to fully control an operating agreement in a modern LLC, without requiring the consent of the LLC's members. The first technique provided uses *cross-ownership* to address any concerns about the need for legal organizations to have shareholders. If an LLC law requires membership—if there is a legal distinction between having members and not having members—then groups of LLCs may be formed that own one another. As illustrated by S. Bayern, cross-ownership can be implemented through this procedure:

"(1) An individual member (the "Founder") creates two member- managed LLCs, A and B, filing the appropriate paperwork with the state. The LLCs each start with a single member, the Founder.

(2) The Founder causes each entity to adopt a desired operating agreement that sets the parameters under which each entity operates (e.g., deferring control to an algorithm).

(3) The Founder causes A to admit B as a member and B to admit A as a member.

(4) The Founder dissociates from both A and B."

At the end of this procedure, two entities exist. Each functions acting only under the control of the operating agreement may defer all decisions to an algorithm.[32] Since shares owned in this type of cross-ownership would otherwise act as a structured strategy to cement control of an existing board of directors, shares held in this form of cross-ownership are prohibited from voting in the classic

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in the operating agreement, the limited liability company is not dissolved and is not required to be wound up if, within one hundred eighty days or such other period as is provided for in the operating agreement after the occurrence of the event that terminated the continued membership of the last remaining member, the legal representative of the last remaining member agrees in writing to continue the limited liability company and to the admission of the legal representative of such member or its assignee to the limited liability company as a member, effective as of the occurrence of the event that terminated the continued membership of the last remaining member".

[31] S. Bayern, *Are autonomous entities possible?* , p. 28

[32] *See* discussion *Are autonomous entities possible?* Part I.

American corporation by statute.[33] This prohibition is absent from the standard LLC law, which does not seek to resolve the policy issues surrounding the takeover of public bodies or the current directors' defences to such takeovers.[34] To achieve the scheme's functional target, neither LLC will need to vote as a member of the other LLC. The right to set up this type of cross-ownership of voting shares is part of the "*freedom of contract*" that traditionally underpins LLC policies[35].

Instead, the second technique provided by S. Bayern relies on *vetogates:* a common trend in organizational law that allows legal entities to be governed by operating agreements. Operating agreements can create a default state of affairs, making it nearly impossible for any pre-existing legal persons or groups of them to change it due to procedural requirements and other vetogates. The term veto gates had been used in the past[36] to describe opportunities for opponents of proposed public legislation to prevent it from being enacted. Practically speaking, many actors need to approve bills before they can become laws[37] Vetogates may also appear in private operating agreements written for business organizations, either by mistake or on purpose. The author provides a significant example to explain more in depth this technique: the example of the "deadlock"; it's common for a small business company to need a supermajority of its members to alter the status quo.[38] LLC operating agreements can also lead to deadlock among members, resulting in infinite periods of time where the organization is frozen because no one can effectively act on its behalf.[39]

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[33] Id, e.g., General Corporation Law, DEL. CODE ANN. tit. 8, § 160(c) (West 2019) ("Shares of its own capital stock belonging to the corporation . . . shall neither be entitled to vote nor be counted for quorum purposes."). This includes shares belonging to another corporation, "if a majority of the shares entitled to vote in the election of directors of such other corporation is held, directly or indirectly, by the corporation . . . .".

[34] Cf. RULLCA pref. note (observing that LLCs are most influential outside public capital markets).

[35] See Limited Liability Company Act, DEL. CODE ANN. tit. 6, § 18-1101(b) (West 2019) ("It is the policy of this chapter to give the maximum effect to the principle of freedom of contract and to the enforceability of limited liability company agreements.").

[36] Linda R. Cohen, *Politics and the Courts: A Comment on McNollgast*, 68 S. CAL. L. REV.1685, 1685–86 (1995) (discussing McNollgast) ("In 1992, McNollgast used this term; McNollgast is a pseudonym used by three distinguished academic commentators on political economy.") REV.1685, 1685–86 (1995) (discussing McNollgast).

[37] William N. Eskridge Jr., *Vetogates and American Public Law*, 31 J.L. ECON. & ORG. 756 (2012) (analyzing the consequences of vetogates for judicial review of agencies' interpretations of statutes).

[38] Fisk Ventures, LLC v. Segal, C.A. No. 3017-CC, 2008 WL 1961156, at *1 (Del. Ch. May 7, 2008) (Considering an LLC whose operating agreement required a supermajority vote from its board for "all essential decisions").
[39] See id.

Since courts are concerned about destroying potentially productive businesses and picking sides among equally blameless (or blameworthy) parties, many LLC laws seek to remedy it by giving courts the power to break deadlock by dissolving an organization upon a member's suit.[40]

However, the granting of such relief is itself exceedingly rare[41]. Furthermore, when dissolution for deadlock is given, it is usually judged considering the operating agreement's policies. As a result, it is relatively easy for the author of an LLC's operating agreement to write it in such a way that the owners, members, or managers—even if they exist—are rendered helpless figureheads. The only limit to how comprehensively such arrangements can prohibit changes to the status quo is the creativity of lawyers. The author also highlights how adding vetogates differs from a simpler arrangement in which a Founder stays attached to an LLC solely to prevent the LLC from being dissolved by a legal framework that mandates that companies have shareholders. However, vetogates, complicated amendment processes, and clear supermajority criteria among even a small group of individuals all provide the organization with meaningfully more realistic freedom, and they all make it less likely that any person will act selfishly to appropriate the entity's properties. In short, vetogates confer an indefinitely large amount of power on the operating agreement at the expense of the current members or managers. These techniques should be somewhat uncontroversial while still becoming extremely difficult to control by courts. Furthermore, if one state allows them, other states are unlikely to intervene with their activity on the grounds that internal governance is governed by the laws of the state in which the organization is organized.[42] Although the same author supports these two techniques, he also argues that LLC organizers can achieve comparable results through outright defiance of the law, which is difficult to prevent or detect. For example, an algorithm or its promoter may simply organize a functionally memberless LLC and falsely specify the name of a member. Doing that, it would be almost impossible to stop algorithms from engaging in in basic legal relationships. In essence, there are several perplexities that arise in a memberless entity when it comes to the technical-formal plan.

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[40] RULLCA § 701(a)(4)(B) (2006) (UNIF. LAW COMM'N, amended 2013) (granting judges the ability to dissolve an LLC when "it is not reasonably practicable to carry on the company's activities and affairs in conformity with the certificate of organization and the operating agreement").

[41] See, e.g., In re Arrow Inv. Advisors, LLC, C.A. No. 4091-VCS, 2009 Del. Ch. LEXIS 66, at *8 (Del. Ch. Apr. 23, 2009) ("Given its extreme nature, judicial dissolution is a limited remedy that this court grants sparingly."); In re Dissolution of 1545 Ocean Ave., LLC, 72 A.D.3d 121, 131 (N.Y. App. Div. 2010) ("Dissolution is a drastic remedy").
[42] E.g., RULLCA § 106(1).

Furthermore, there are many states statutes'[43] which contain provisions that appear to make memberless LLCs impossible such as Delaware, the most important state for business organization law. Delaware's law makes it clear that an LLC must have at least one member, or else it is not an LLC:

""*Limited liability company" and "domestic limited liability company" means a limited liability company formed under the laws of the State of Delaware and having 1 or more members.*""[44]

Delaware's safe harbour provides that the LLC does not dissolve if, within 90 days or some other fixed period stated in the operating agreement, the legal representative of the last remaining member makes arrangements to have a new member join the LLC. In conclusion the debate on memberless entities, governed by an artificial intelligence, is still a very discussed and delicate topic as the continuous evolution of this category of companies is totally changing the possible vision of managing and doing business in the corporate world.

C. Concept of Artificial Personhood

"Should we grant 'legal personhood' to A.I. systems and give them legal recognition in the same way that the law recognizes corporations and natural persons?"[45]
"" Should we recognize AI as "artificial personhood"?"[46]

These two questions fully reflect the conflicting views in society about this evolution of technology. Artificial intelligence (AI) is a technology that is changing every aspect of life. It's a versatile tool that allows people to rethink how they integrate data, evaluate it, and use the resulting insights to make better decisions. AI generally is thought to refer to *"machines that respond to stimulation*

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[43] See Id ("By way of consent, a formal written law of a legislative authority rules the legal entities of a city, state, or country. Statutes usually require or prohibit something or establish policy.").

[44] Del. Code Ann. tit. 6, § 18-101.

[45] Matt Scherer, *Is AI personhood already possible under U.S. LLC laws? (Part three),* LAW AND AI (June 2017).

[46] Id ("AI can act human and put on the outer appearance of being human, which may convince us they are human, but on the inside, they are only a series of code and instructions, and they will never be truly human.").

consistent with traditional responses from humans, given the human capacity for contemplation, judgment and intention.[47] These definitions emphasise that artificial intelligence is primarily based on interaction with mankind, to which it has already presented several challenges; some of these lie in the plane of law and are closely related to the issues of morality, ethics and religion. This analysis on the concept of Artificial Personhood is introduced by some reflections on Bayern's article, previously cited, and then shifts its attention to the perception that individuals might have on AI and the consequences of such perception.

In Bayern's work, he focuses his attention primarily on the prospect of a "Zero-Member" or "memberless" LLC. ("Members" of a LLC are roughly analogous to partners in a partnership). Bayern cites one unsettling outcome of most states' LLC laws' extreme versatility. Since several states grant LLCs near-unrestricted autonomy in drafting the operating agreements that regulate their day-to-day activities–and, in many cases, their management structure–a LLC could theoretically be controlled by an operating agreement that essentially allows it to do whatever an autonomous system tells it to do. The LLC managers' (or member-managers') fiduciary duty of care[48] should theoretically keep such a system's autonomy in check. However, some state LLC laws allow LLCs to create operating agreements that restrict or exclude that duty of care. It's possible that the entity's administrators have no personal legal responsibility to carry out their management obligations.[49] Even if those obligations cannot be contractually excluded, the concept of limited liability reduces the incentive for members and managers to oversee the scheme, particularly because LLC laws concentrate almost entirely on managers' responsibilities to the LLC and its members, rather than to third parties. The moral hazard posed by limited liability isn't new, but it's particularly concerning in the age of autonomous machines. Furthermore, Bayern does point out one possible "loophole" by which an autonomous AI device could effectively regulate an LLC and thus have the legal personhood equivalent. Setting up two LLCs, one of which is the sole member of the other, and both of which have similar operating agreements, allowing one autonomous system effective control over both LLCs, will be the workaround. This point made on "entity cross-ownership" is supported by the fact

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[47] Shukla Shubhendu & Jaiswal Vijay, *Applicability of Artificial Intelligence in Different Fields of Life*, ISSN (Online): 2347-3878 Volume 1 Issue 1 (Sept 2013).

[48] *Supra* note 31 ("The managers who have been charged with the responsibility for running the LLC have a duty to the members and other managers to act in good faith and promote the interest of the LLC. In most states, the manager's fiduciary duties include the duty of loyalty and the duty of care.").

[49] Id ("At least not to the LLC itself or its members; LLC laws do not eliminate the possibility that a third party could "pierce the veil" and sue a LLC member/manager directly.").

that in at least a couple of states[50] there are no provisions that would prevent or discourage such point; many states' statute permit LLC's membership and management structure to be anonymous and opaque to the outside world, and this means that even if a memberless LLC were legally illegal in any jurisdiction, outside parties will have no way of knowing if an LLC under the control of an AI scheme had become a memberless body. Concerns about the risks of anonymous LLCs aren't recent or exclusive to AI, but that doesn't make them any less concerning. Indeed, as Bayern observes *"the permission of just a single state would be sufficient to enable autonomous businesses".[51]* Regardless of whether AI personhood is perceived or not, Bayern convincingly argues that LLC actions could serve as a useful model for AI personhood in the future, for better or worse. Historically, legal systems have only regarded human beings and entities essentially regulated by human beings as entities endowed with "legal personhood"– that is, the ability to sue, be sued, and take actions in the world that the legal system will enforce. If Bayern's claim is right, it means that legislators have unintentionally produced a new category of personhood–the first in history to exist without active human control.[52]

Furthermore, the difficulty of the perception of AI, and the outcome of its activities, is one of the greatest challenges facing society; furthermore, considering that "AI entities are designed to operate at an increasing distance from their developers and owners"[53] accountability gap is another problem associated to this field. It is essential and necessary to find a universal approach suitable for managing these ongoing challenges because without such an approach we would face problems due to the radically different solutions already adopted by some countries. The legal personhood of artificial intelligence is considered one of the leading solutions to the above-mentioned difficulties. However, this phenomenon of personification of AI raises a lot of controversies, in fact there is no unanimity

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[50] Ibid.

[51] Shawn Bayern, *Of Bitcoins, Independently Wealthy Software, and the Zero-Member LLC*, 108 N.W. U. L. REV. ONLINE 257 (2014).

[52] Stefania Lucchetti, *Why Artifical Intelligence will need legal personality*,), LAWCROSSBORDER (TECHNOLOGY AND LAW), (22 May 2017).

[53] Kateryna Militsyna, *Legal Personhood for Artificial Intelligence: Pro, Contra, Abstain?,* VOL. 122, PP. 150–158, (2022).

about the "expression" of this concept even among those who accept the idea of personhood favourably. To provide a detailed analysis of this unanimity caused by the association given to artificial intelligence, it is appropriate to argue the meaning and characteristics of legal personhood. The concept of legal personhood relates to an entity which is subject of legal rights and duties.[54] The law recognizes two types of legal personhood:

- Natural – Those which are recognized because of the simple fact of them being humans.[55]
- Judicial – Those are non-human in nature and have been granted certain rights and duties by law.[56]

The concept of natural legal personhood is completely rooted to the legal system while the judicial legal status, under the legal system, has been provided to corporations, governmental entities, religious entities, etc. More specifically, the judicial personality is based on three theories:

(1) The aggregate theory: individual members work in a group as a single entity, while establishing contractual relations, for cost cutting.

(2) The realist theory: suggest conferment personality to non-human entities as a matter of right.

(3) The fiction and concession theory: non-human entities have a personality because the legal system chooses to give it to them.

The above definition and description of judicial personality highlights the unanimity and questions created when associating this concept with artificial intelligence systems.[57] The main questions concern what kind of legal attribution AI should have, whether these systems should be subject to complete rights and duties or to a specific set of legal rights and duties and, secondly, whether they should be provided with only rights or only duties.[58] If a precise set of legal rights and obligations

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[54] Lawrence B. Solum, *Legal personhood for artificial intelligences*. NORTH CAROLINA LAW REVIEW, 70(4), 1238–1239 (1992).

[55] Ngaire Naffine, *Who Are Law's Persons? From Cheshire Cats to Responsible Subjects,* 66 MLR 346, (2003).

[56] Ibid.

[57] Colin Mackie, *From Privilege to Right: Themes in the Emergence of Limited Liability*, 4 JURIDICAL REVIEW 293, 309, CITING HC DEB 29 JUNE 1855, VOL 139, COL 323, (2011).

[58] Ibid.

has been established, it is possible that they will not be the same for all entities. If solely AI systems are granted rights, it will generate standing issues since human beings will be able to act on behalf of non-human rights holders rather than having to demonstrate standing.[59] If, on the contrary, they were only given duties, this would create problems of responsibility.

The arguments in favour of extending legal personality to AI systems are based on the idea that "Robotics Rights"[60] should be considered alongside "Human Rights". Individuals who support this believe that robots' rights should be recognized as well. The proponents have also listed several benefits that humans would experience in the long run. According to Jurist, if AI systems are given legal personality, it will ensure that someone can be held accountable if something goes wrong. This is proposed as a solution to the accountability gaps that their speed, autonomy, and opacity may cause.[61] AI systems can be punished in a variety of ways, including retribution, incapacitation, deterrence, and rehabilitation, and they can also be likened to corporations.[62] This will make it easier to bring the AI system under the control of both civil and criminal courts. There would be rights to destroy the robot in circumstances of extreme default. If the circumstances warrants, the robots could be fined, their possessions taken, or their operating licenses terminated or cancelled. Therefore, giving legal personality to these systems consequently ensures accountability of their actions, which will also help guarantee the ethical principles of artificial intelligence, including reliability, responsibility and transparency.[63] Further, such an empowerment would help to ensure that ownership of the work done by the AI system rests with the latter, rather than with the parent that owns the AI system. In cases where something has been created by the AI, ownership rights, i.e. intellectual property rights, will belong to the latter and humans will not be able to take credit for it. Due to this[64], other legal

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[59] Christopher Rodgers, *A new approach to protecting ecosystems,* 19 ENVLREEV 266, (2017).

[60] Id ("When it comes to intelligent machines and human rights, consciousness, autonomy, and rationality are the deciding criteria. In order to avoid inappropriate human-robot contact and recognize robots' position in modern society, a particular set of rights could be granted to them.").

[61] S Chesterman, *Artificial Intelligence and the Problem of Autonomy*, NOTREDAME JOURNAL OF EMERGING TECHNOLOGIES 210 (2020).

[62] S Chesterman, *Through a Glass, Darkly:Artificial Intelligence and the Problem of Opacity,* AJCL (FORTHCOMING), (2021).

[63] Virginia Dignum, *The ART of AI – Accountability, Responsibility, Transparency*, (Mar 4, 2018).

[64] Copyright, Designs and Patents Act 1988 (UK), section 9(3), Copyright Act 1994 (NZ), section 5(2)(a), Copyright Amendment Act 1994 (India), section 2, Copyright Ordinance 1997 (HK), section 11(3), Copyright and Related Rights Act 2000 (Ireland), section 21(f).

personalities are denied ownership of the IP[65] generated by it. According to whoever, a system like this promotes "the dignity of human invention over computer creativity." AI systems would be protected from human manipulation if they were given legal personality. Because legal personhood gives the AI system the capacity to sue and be sued, it will have its own name and recognition. This would reduce the likelihood of it being controlled for human benefit. Additionally, a system of veiling, like that used by companies, can be developed for AI systems. This would strengthen AI systems' resistance to human manipulation.[66] This is in the AI systems' best interests, and it can only happen if they are given legal personality. Furthermore, giving AI systems legal personality would allow them to enter into contracts.[67] The employment of electronic agents to reach enforceable agreements is not a new concept; for example, in high-frequency trading, computers make agreements with other algorithms on behalf of regular people.[68] According to these ideas, extending personhood to such AI systems would increase work mobility and reduce the potential liability gaps posed by AI in contracting.

But every argument has two approaches, for just as there are numerous arguments in favour of this award, there are also other arguments against it. Many believe that granting legal personality to robots will result in a slew of issues. Among the various arguments that raise doubts about this legal association with artificial systems, there is first and foremost the threat they could present to the human owner of the system itself. Giving robots legal personality will result in the development of a principle-agent/Master-servant relationship between the owner and the robot, making the owner liable for the machine's actions under strict responsibility.[69] Many people also believe they can go even further in completing extra-ordinary tasks, which might be harmful. In many circumstances, there will be no means of knowing whether the AI operated in accordance with the owner's instructions or its own recoding of the instructions. And requiring accountability would be damaging to the owner's interests. Furthermore, the granting of legal rights creates doubts as to a possible conferral of intellectual property rights on robots. Not only does this disrespect the owner's efforts in realizing the

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[65] Id ("A person or company owns intellectual property, which is legally protected from unauthorized use or application. Trademarks, patents, and copyrights are just a few examples of intellectual property assets.").

[66] J Turner, '*Robot Rules: Regulating Artificial Intelligence*' (Palgrave Macmillan 2019) 193.

[67] S Chopra & LF White, *A Legal Theory for Autonomous Artificial Agents,* UNIVERSITYOF MICHIGAN PRESS 160, (2011).

[68] T Cuk and A van Waeyenberge, *European Legal Framework for Algorithmic and HighFrequency Trading (Mifid 2 and MAR) A Global Approach to Managing the Risks of the ModernTrading Paradigm,* 9 EJRR 146, (2018).

[69] Ryan Abbott & Alex Sarch, *Punishing Artificial Intelligence: Legal Fiction or Science Fiction,*53 UC DAVIS LAW REVIEW 1, 323 (2019).

artificial intelligence system, but the credit for any work done by the latter will remain with it, and the owner will not even have moral rights to that work.[70] Also, similar to how the concept of 'Separate legal entity'[71] lifting provides an advantage to the company's shareholders, there is a risk that the owners will abuse the 'Separate legal entity' status provided to the Robots by conferring all responsibility and liability on them and evading their own liability. Therefore, in agreement with these arguments, giving legal personality to the IA system would not be in the interest of society. Concluding this analysis, the decision on conferring legal personality on AI system depends on the actual social necessity. The most crucial factor in determining whether an AI system should be granted legal status is if it is in the best interests of society. The subject of legal status should only be examined if it is in the best interests of society.

"The consideration that an autonomously functioning artificially intelligent robot should have a secure legal subjectivity is dependent on the actual social necessity in a certain legal and social order"[72]

There are still many conflicting opinions on this subject, which is evolving every day in step with our society. A striking example of this technological evolution in the corporate world is the emergence of decentralised autonomous organisations (DAOs).

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[70] Marcelo Corrales & Mark Fenwick, *Robotics, AI and the Future of Law -Do We Need New Legal Personhood in the Age of Robots and AI,* PERSPECTIVES IN LAW, BUSINESS AND INNOVATION, (2020).

[71] Id ("In the US, an LLC (a limited liability company) is a separate legal person and entity, in the same way as an English PLC, limited company or limited liability partnership.").

[72] Prime Legal (Leaders in the Law of Ideas), *Legal Personhood of Artificial Intelligence System*, (2020).

II. The case of DAOs

A. Can a DAO be a legal entity?

The continuous evolution of technology, which influences our society today in tandem, has caused the emergence of new types of entities such as DAOs. The Decentralized Autonomous Organization has completely overturned the management of a company in the corporate sphere, given the new rules used and the type of operation.[73] Decentralization and disintermediation[74] are aided by blockchain technology and smart contracts. These new technologies lower transaction costs, increase agency, and provide a foundation for secure social and economic interactions.[75] They've changed crowdfunding and fueled new business models for decentralized platforms. Overall, DAOs have the potential to usher in a new age in organizational economics, shifting the global business landscape from hierarchical to democratic and distributed organizations, fueled by organizational entrepreneurship and innovation.[76] Moreover, these new types of entities are among the most debated issues today, as the legal attribution to such an organization is not yet shared by everyone in the corporate world.[77]

DAOs are sometimes mistakenly associated with Ethereum, a platform that provides free access to digital currency and data-friendly services to anyone, regardless of their background or geographic location. While Ethereum is credited with bringing this notion to a wider audience in the blockchain industry, DAOs were created much earlier. Werner Dilger, a renowned German computer science professor, was the first to propose this novel idea.[78] In 1997, Dilger published his paper "Decentralized Autonomous Organization of the Smart Home based on the Immune System

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[73] DuPont, *Cryptocurrencies and blockchains*, JOHN WILEY & SONS (2019).

[74] *Supra* note 66 ("the elimination of intermediaries from the process of acquiring goods and services, so that supply and demand can meet directly, without any mediation whatsoever.").

[75] *Supra* note 67.

[76] Hanna Halaburda, Miklos Sarvary & Guillaume Haeringer, *Smart contracts and Blockchain*, SPRINGERLINK, (Jan 2022).

[77] Alexandra Sims, *Decentralised Autonomous Organisations: Governance, Dispute, Resolution and Regulation*, (UNIVERSITY OF AUCKLAND BUSINESS SCHOOL) SSRN, (Nov 2021).

[78] Y. Faqir-Rhazoui, J. Arroyo & S. Hassan, *A comparative analysis of the platforms for decentralized autonomous organizations in the Ethereum blockchain*, JOURNAL OF INTERNET SERVICES AND APPLICATIONS, 12(9), 1-20, (2021).

Principle"[79] Dilger established DAO's foundation as a self-contained and autonomous system in it, a work that was unquestionably ahead of its time. His plan, however, was unfeasible at the time. Until the emergence of blockchain, the technical hurdle of building a DAO could not be addressed.[80] The DAO concept was resurrected at that point. Daniel Larimer, the founder of BitShares and steem, presented about Decentralized Autonomous Corporations (DACs) at a bitcoin event on September 7, 2013. DACs were described as a new corporate governance form, using tokenized tradable shares as a means of providing dividends to shareholders. As "open-source software spread among the computers of its stakeholders," such organizations were defined as "incorruptible," operating "without any human intervention" and with "publicly auditable" bylaws.[81] According to this definition, anyone could be a DAC stakeholder by "purchasing stock in the firm or being paid in stock to deliver services to the company".[82] As a result, DAC stockholders would be entitled to "a share of the company's income, involvement in its growth, and/or a say in how it is run".[83] As a result, numerous alternatives to the term emerged, leading to the development of decentralized applications (DAPPS)[84] and, eventually, the adoption of DAOs as a replacement for DACs[85]. Afterwards, in fact, it wasn't until 2015 that Vitalik Buterin[86], the co-founder of Bitcoin Magazine, reintroduced the concept, which allowed to produce transparent and immutable sophisticated protocols (complete Turing)[87], substantially simplifying the creation of DAOs and interacting with them.

Decentralized organizations are collectively owned and managed by their members via smart contracts.[88] A smart contract is a system that involves digital assets and two or more parties, in which

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[79] Id ("The basic principles of the intelligent home technology are presented, and it is described how it can be modeled as a multi-agent system. Because of the complexity of the system, it is argued that it should be generated by an evolutionary process and maintained according to the principles of the immune system.").

[80] *Supra* note 72.

[81] Bellavitis, Cristiano and Fisch, Christian and Momtaz, Paul P., *The Rise of Decentralized Autonomous Organizations (DAOs): A First Empirical Glimpse*, SSRN, (Apr 2022).

[82] *Supra* note 71.

[83] Ibid

[84] David Johnston, *The General Theory of Decentralized Applications, DAPPS*, DAVID JOHNSTON CEO (2013).

[85] Vitalik Buterin, *DAOs, DACs, DAs and More: An Incomplete Terminology Guide*, ETHEREUM FOUNDATION BLOG, (May 2014).

[86] Id (Vitalik Buterin would later co-found the Ethereum platform in 2014).

[87] *Supra* note 77 ("Turing Complete refers to a machine that, given enough time and memory along with the necessary instructions, can solve any computational problem, no matter how complex").

[88] *Supra* note 71.

some or all the parties put assets in and assets are automatically redistributed among those parties according to a formula based on data that is unknown at the time the contract is launched[89] ; operating in a decentralized manner, smart contracts serve to settle transactions. DAOs are a revolutionary organizational paradigm that has the ability to completely transform how businesses run.[90] A revolutionary technology infrastructure enables the organizational innovations connected with the growth of DAOs. DAOs are created using blockchain technology as the platform. Blockchain is a distributed and digital ledger that records transactions in an immutable and transparent manner.[91] The introduction of blockchain technology has had a significant impact on the business sector, and it is one of the main foundations of the push toward a decentralized economy[92] and financial system[93], which is fueled in part by the tokenization of new businesses through initial coin offerings (ICOs)[94] DAOs' blockchain-based nature has various ramifications that set them apart from regular businesses. To begin with, organizational governance differs dramatically from present, more traditional systems of governance[95]. Traditional organizations operate by top-down, private, and centralized decision-making, whereas DAOs work through public and distributed decision-making, in which any DAO member can typically propose and vote on any form of corporate decision.[96] This framework allows all DAO members who share common goals and principles to collaborate and engage with the community. These objectives are varied and specified in the smart contracts that underpin DAOs.[97]

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[89] *Supra* note 78 ("An employment agreement is an example of a smart contract: A want to pay B $500 to create a website. The contract would go like this: A invests $500 in the contract, securing the funds. When B completes the website, B can send a message to the contract requesting that the cash be released. The monies are released if A agrees. If B decides not to finish the website, he or she can withdraw funds by sending a message. If B says that he completed the website, but A disagrees, it is up to judge J to render a decision in A or B's favor after a seven-day waiting period.") (May 2014).

[90] *Supra* note 69.

[91] Nakamoto, *Bitcoin: A peer-to-peer electronic cash system*, DECENTRALIZED BUSINESS REVIEW, 21260 (2008).

[92] David Yermack, *Corporate governance and blockchains*, REVIEW OF FINANCE, 21(1): 7-31 (2017).

[93] *Supra* note 74.

[94] Bellavitis, C., Fisch, C., Wiklund, J., *A comprehensive review of the global development of initial coin offerings (ICOs) and their regulation*, JOURNAL OF BUSINESS VENTURING INSIGHTS, 15, E00213, (2021).

[95] *Supra* note 76 ("The goal of corporate governance is to enable effective, entrepreneurial, and responsible management that will ensure the company's long-term prosperity. The mechanism through which firms are directed and governed is known as corporate governance. The governance of their companies is the responsibility of their boards of directors.").

[96] *Supra* note 82.

[97] *Supra* note 66.

DAOs can solicit and distribute donations, for example, or collect and invest funds in potential venture initiatives.[98] DAOs often have treasuries that can only be accessed with the approval of members. DAOs are frequently funded through token sales, such as initial coin offerings (ICOs)[99] or non-fungible token (NFT) auctions[100]. These token sales allow businesses to raise significant amounts of money from many people in exchange for tokens that can have voting rights[101], for example. Second, DAOs' decentralized structure allows for new business models to emerge[102], which act as catalysts for more disintermediation.[103] Through disintermediation, DAOs have begun to undermine intermediated business models and industries where such platforms are prevalent.[104] The promise of more favorable rent sharing, in which entrepreneurs and investors, or sellers and purchasers, get to share the transaction surplus alone without having to pay for intermediation services, is at the heart of the trend toward more disintermediation.[105] In theory, smart contracts[106] might govern markets, industries, and entire economies, driven by robotics and regulated independently by DAO members. The number of DAOs and their influence are quickly growing. Stories like a Constitution DAO's $40 million offer on an actual copy of the United States constitution in 2021 has been one of the striking results of the growing impact.[107] Similarly, the number and value of DAOs have exploded since 2019[108]. DAOs provide transparent, distributed, and decentralized decision-making that improves disintermediation not just within businesses, but also at the market, industry, and economy levels,

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[98] Bove T., A DAO outbid a billionaire for an original copy of the U.S, constitution last year and nearly won (2022).

[99] *Supra* note 86.

[100] Dominic Chalmers, Christian Fisch, Russell Matthews, William Quinn, Jan Recker,
Beyond the bubble: Will NFTs and digital proof of ownership empower creative industry entrepreneurs?, JOURNAL OF BUSINESS VENTURING INSIGHTS, VOLUME 17, E00309, ISSN 2352-6734, (2022).

[101] Fisch, C., & Momtaz, P. P., *Institutional investors and post-ICO performance*, (2020).

[102] *Supra* note 66 ("A venture fund is a real example of a DAO, in which individuals can pool cash from all around the world, choose which initiatives to sponsor, and decide how to disperse refunded funds, all through the vote of its members.").

[103] *Supra* note 77.

[104] Ibid.

[105] *Supra* note 75.

[106] Id

[107] *Supra* note 92.

[108] *Supra* note 76 ("DAOs, with their unique structure, hold the potential of allowing an emphasis on community rather than profit, and hence may provide a more socially conscious organization.").

thanks to their decentralized nature.[109] The line between shareholders, management, and other stakeholders, such as industry participants, is blurring, resulting in a slew of advantages and challenges.[110]

The literature on corporate governance has long stressed the potential agency costs associated with conflicts of interest between managers and shareholders in traditional firms[111]. However, because the responsibilities of principals and agents overlap in DAOs, agency costs could be drastically lowered. DAOs adopt a decentralized bottom-up method, whereas traditional corporations are hierarchically directed by executives who make top-down choices.[112] Members, in other words, can make proposals, which are subsequently voted on by the entire organization. Tokens[113], which reflect digital voting rights that permit the token holder to participate in decision-making[114] and so coordinate DAO governance, are often used to identify DAO members. More tokens often improve voting power, and token ownership thresholds for presenting proposals are occasionally in place. The voting-based governance approach eliminates the need for hierarchy and bureaucracy, as well as the requirement for human management[115]. Furthermore, although traditional companies make decisions in private, DAO decisions are transparent and publicly visible on the blockchain. As a result, the public is aware of which decisions were made and how the DAO members arrived at their conclusions.[116]

Furthermore, DAO governance[117] is shaped by blockchain technology, which is fundamentally different from traditional companies. The blockchain code, which is public and freely accessible, governs these entities.[118] The original smart contracts for the DAOs, which define the aims and

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[109] *Supra* note 88.

[110] WIlliams, *Company law and autonomous systems: a blueprint for lawyers, entrepreneurs, and regulators, in Hast*, Sc. Tech. L. J., 9, 2, 2017, P. 135 and S. Bayern, *Are autonomous entities possible?,*NW. U. L. Rev., 114, 2019, p. 23.

[111] Jensen, M.C., Meckling, W.H.,*Theory of the firm: managerial behavior, agency costs and ownership structure*, Journal of Financial Economics, 3(4), 305-360, (1976).

[112] *Supra* note 103.

[113] *Supra* note 66 ("Tokenisation is the process of representing interest in fractional ownership of an asset, either a utility asset or a security asset, with a blockchain-based token. The Ethereum-based ERC20 token is one of the most widely used blockchain-based tokens.").

[114] Ibid (e.g., one token, one vote)

[115] Hackl, C., *What are DAOs and why you should pay attention*, Forbes, (2021).

[116] *Supra* note 96.

[117] See Appendix B to analyse DAO's governance and its governance strategies (see *supra* note 75).

[118] *Supra* note 102.

governance framework, are difficult to reverse.[119] Any DAO decisions must adhere to this smart contract, and any changes to the smart contract must be approved by a voting process. Decisions are made in groups and are primarily based on codifiable data. As a result, DAOs' traits – principal-agent overlap and high transparency – considerably eliminate conflict of interest[120] and moral hazard in this type of organization. When it comes to openness and agency expenses, this governance mechanism could represent a paradigm leap[121]. As a result, DAO governance and decision-making could drastically reduce transaction costs because smart contracts define the rules of the game and govern the decision-making process, but executing a smart contract is significantly less expensive than corporate board meetings[122], corporate bottom-up decision-making, labor union involvement, and so on.[123]

Finally, decentralized and decentralized organizations like DAOs can benefit from "wisdom of the crowd"[124] since decision-making power is divided among members of the DAO. Crowd-sourced decision-making is becoming increasingly important in a variety of industries, including product development[125], technological start-up funding[126], and scientific research[127]. It has been discovered

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[119] Ibid.

[120] *Supra* note 107 ("A conflict of interest occurs when a person prioritizes personal benefit over responsibilities to an organization in which they are a stakeholder, or when they use their position for personal advantage. Corporate board members have fiduciary and loyalty responsibilities to the companies they manage").

[121] Virginia Dignum, *The ART of AI – Accountability, Responsibility, Transparency,* (Mar 2018).

[122] Ibid ("Board meetings are held to discuss any challenges that the firm is facing, to review the company's performance, and to discuss new policies that will be implemented").

[123] Ibid.

[124] *Supra* note 107 ("When it comes to problem-solving, decision-making, innovating, and predicting, the wisdom of crowds is the belief that big groups of individuals are collectively smarter than individual experts. The premise is that an individual's perspective is intrinsically skewed, whereas using the average knowledge of a population can eliminate bias or noise, resulting in a clearer and more coherent outcome. The idea is frequently applied to financial markets to explain why markets perform efficiently in some cases and inefficiently in others. For markets to function properly, market participants must be diversified and have an incentive.").

[125] Su-Yeon Park, Moonsoo Kim, Kyung-nok Chun, *Understanding Decentralized Autonomous Organizations (DAOs) as a Reaction to Corporate Governance Problems*, SMATOOS BUSINESS REVIEW, (2022).

[126] Chohan, U., *The Decentralized Autonomous Organization and Governance Issues* (Notes on the 21st Century) [Discussion Paper]. UNIVERSITY OF NEW SOUTH WALES, (2017).

[127] Ibid.

that crowds may accurately foresee events[128] and act differently than experts[129]. DAOs are thus the inevitable progression of crowd-sourced decision-making platforms.[130]

DAOs decentralize decision-making not only within businesses, but also across marketplaces, industries, and economies. The separation between principals, agents, and other stakeholders, such as industry participants, overlaps to some extent in DAOs, as previously discussed.[131] DAOs are thus the next step in the evolution of platform-based markets, industries, and economies. Not long ago, technological breakthroughs such as the internet and cellphones fueled a surge of new centralized platform-based company models. Many industries were ruled by giant conglomerates at the center of industries before the arrival of modern technologies. Many industries have been affected by centralized platforms, including movies[132], retail[133], music[134], and mobile applications[135]. Platforms have concentrated commercial and economic power in the hands of a small number of corporations. As these platforms build network economies, their behavior toward complementors and suppliers becomes less supportive[136]. Etsy, a platform for creatives, is an example. Fees for the platform began at 3.5 percent in 2018, up to 5% in 2018, and then to 6.5 percent in 2022. As a result of these changes, regulators are considering dismantling major platforms[137] or fining them for unfair market practices[138]. Financial markets have had similar characteristics for centuries. Financial institutions operate as middlemen between savers and borrowers who would otherwise find it difficult to deal on their own[139]. As a result, while platforms and intermediaries assist lower transaction costs and

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[128] *Supra* note 113 (e.g., U.S. Presidential elections) (Ray, 2006)

[129] *Supra* note 118.

[130] *Supra* note 66.

[132] Ibid (e.g., Netflix)

[133] Ibid (e.g., Amazon)

[134] Ibid (e.g., Spotify)

[135] Ibid (e.g., iTunes)

[136] Ryan Abbott & Alex Sarch, '*Punishing Artificial Intelligence: Legal Fiction or Science Fiction',* 53 UC DAVIS LAW REVIEW 1, 323 (2019).

[137] Id (For example, the U.S. Congress has introduced a bill to break up large tech firms).

[138] Id (For example, Google has been fined by the European antitrust for unfair market practices. Following that, Google was penalized billions twice more for antitrust infractions, and it filed an appeal in each case).

[139] *Supra* note 75.

facilitate transactions, they also gain enormous (market) power, financial resources, and market dominance[140].

DAOs have the capacity to alter markets, businesses, and entire economies by transferring power to members of various ecosystems, such as Amazon merchants, Spotify artists, and Etsy creators. DAOs can lower transaction costs and produce network effects[141] without incurring monopoly costs by minimizing the participation of centralized platforms[142]. When a DAO dominates an industry, no single company gains monopolistic power, allowing all DAO members to benefit from network effects to increase transaction possibilities, cooperation, and community development, resulting in increased innovativeness and efficiency.[143] Several studies have looked at the advantages of collaboration in terms of increasing innovation. The whole literature on open innovation[144] is based on the premise that companies should collaborate with other companies to innovate[145]. Rather of competing with other businesses, cooperating allows partners to access complementary resources that can help with innovation development[146].

DAOs, which extend these concepts to individuals, allow a diverse group of people to collaborate on new goals and projects by sharing knowledge, resources, and ideas.[147] DAOs stress and foster community building, which is critical in generating sustainable ecosystems, by sharing authority and decision-making inside an organization.[148] For several years, distributed organizations built on big communities, such as Wikipedia or Anonymous (hackers), have existed. However, a DAO promotes

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[140] Boris Babic, Daniel L. Chen, Theodoros Evgeniou, and Anne-Laure Fayard, *A Better Way to Onboard AI,* HARVARD BUSINESS REVIEW (2020).

[141] Ibid (A network effect, also called network externality or demand-side economies of scale, is the phenomenon by which the value or utility a user derives from a good or service depends on the number of users of compatible products.)

[142] Christian Catalini & Joshua S. Gans, *Some simple economics of blockchain*, COMMUNICATIONS OF THE ACM VOLUME 63, NUMBER 7 (2020), Pages 80-90.

[143] Ibid.

[144] *Supra* note 136 ("Businesses and organizations that embrace open innovation seek ideas from both external and internal sources. This entails sharing expertise and information about problems, as well as seeking solutions and opinions from those outside the company").

[145] Chris Berg, Sinclair Davidson and Jason Potts, *Institutional Cryptoeconomics: A New Model for a New Century*, COINDESK(Sept 2017).

[146] Ibid.

[147] *Supra* note 66.

[148] *Supra* note 105.

interaction, alignment of interests, trust, and openness in ways that were previously impossible[149]. Because a DAO does not require a controlling party, it enables for free access and permissionless innovation—that is, developers can test new products and ideas without fear of repercussions from a central governing institution[150]. Decentralized organizations empower developers by promoting permissionless innovation and community creation, allowing them to contribute to the DAO in unique and unexpected ways. DAOs can also improve the efficiency of organizations and industries. The so-called "make or buy dilemma" asserts that corporations internalize transactions to lower transaction costs that would otherwise occur in the open market[151]. DAOs use modern technology such as smart contracts, robotics, and remote tracking[152] to automate the entire transaction process amongst several unconnected parties who may be situated all over the world. These innovations improve efficiency, lower transaction costs, and speed up decision-making[153]. As a result, DAOs have the potential to fundamentally alter our understanding of companies, the benefits of internalization[154], and various organizational structures.[155]

While smart contract-based, on-chain governance is a key aspect of DAOs that allows for trans-parent and democratized decision-making, it can also lead to coordination inefficiencies[156]. The fact that every decision must be voted on by the DAO members, for example, can take longer than traditional top-down decision-making by executives. As a result, voting-based governance has constraints when

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[149] *Supra* note 75.

[150] *Supra* note 96.

[151] Vishal Marria, *The Future of Artifical Intelligence in The Workplace,* FORBES, (2019).

[152] *Supra* note 66 ("Remote tracking systems are software applications that employees utilize to keep track of their own actions. These systems usually include a built-in network that allows you to view data from multiple systems on a single screen. Many systems are web-based, which means that the data from all the monitoring devices is stored on a single server.").

[153] *Supra* note 125.

[154] S. Hassan, P. De Filippi, *Decentralized Autonomous Organization*, INTERNET POL. REV., 10 (2) (2021), PP. 1-10.
 ("the process where business gets more involved in the international markets.").

[155] Ibid.

[156] Ibid ("Coordination is the method by which a manager integrates their operations. Coordination is the systematic arranging of group efforts in order to ensure harmony among individual efforts in the pursuit of an organization's common goals. It is the power that connects all management functions.").

it comes to making time-sensitive decisions. In a similar line, new study reveals that due to search and coordination-related frictions, DeFi markets[157] only provide half of the potential welfare[158].

Another factor that can make decision-making in DAOs more difficult is that DAO members can become inactive and stop voting[159]. Furthermore, significant shareholders, like as institutional investors or the project's initial developers, who often possess a large percentage of the tokens, might influence DAO decisions, compromising the democratic voting process' legitimacy[160]. If only a tiny portion of the community becomes actively involved in DAO administration, they may be able to take advantage of the rest crowd's inattention to extract private control benefits, reducing DAOs' ability to minimize agency costs.[161] Alternatively, delegating DAO management and decision-making to some elements of a decentralized population could potentially lead to freeriding, as engaged voters are not (necessarily) compensated for their participation. The future empirical question is whether delegated management without pay a sustainable manner of is organizing and making decisions in DAOs. Individuals can also face participation difficulties when it comes to DAOs.[162] Individuals must expend effort to understand and enter a market, which is referred to as participation costs[163]. Because DAOs are built on blockchain technology and smart contracts, a high level of technical knowledge is required to comprehend them. Similarly, there are numerous governance modes available today.[164]

Familiarizing oneself with the technological and economic intricacies of DAOs is thus connected with high expenses and may result in a segmentation of investors who invest in DAOs vs those who do not, as well as the potential need to reestablish intermediation or hierarchy.[165] Security threats are

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[157] Aaron Wright, *The DAOs – DAOs from a Legal Perspective*, EPICENTRE (Jan 2021).

[158] *Supra* note 75.

[159] *Supra* note 66.

[160] Id.

[161] Supra note 151 (" Decentralized finance (DeFi) is a new financial system based on distributed ledgers that are like those used by cryptocurrencies. The system decentralizes authority over money, financial products, and financial services from banks and institutions. An example of DeFi coins to buy is Ankr (ANKR)").

[162] Ibid.

[163] Allen, F. & Santomero, A.M., *The Theory of Financial Intermediation. Journal of Banking and Finance*, 21, 1461-1485, (1997).

[164] Id (e.g., one token, one vote is the most prevailing mode, but there are more than 150 different modes)
[165] *Supra* note 75.

also posed by the potentially inefficient voting procedure. Bugs and security holes in the code must also be corrected through a voting procedure.[166] DAOs are vulnerable to malicious attacks and fraud because this procedure is time-consuming and requires consensus.[167] For example, the lack of human-led governance contributed to a sluggish response to the well-known 2016 "The DAO" attack, in which $60 million was taken thanks to a flaw in the DAO's programming.[168] In addition to being wasteful, this example shows how DAOs can be hacked or exploited if their smart contract settings are wrong. In another case, a DAO was taken over after a single person collected enough tokens to vote and pass proposals on their own and gained access to the DAO's treasury.[169]

B. Regulating the DAO

"There is no such thing as survival of the fittest, only survival of the fit. This means that there is no one answer that is right, but many answers that might work"[170]

The legal treatment of DAOs as an organizational form is determined by Institutional Cryptoeconomics (IC)[171], a new methodology first raised in 2017[172], which applies 'the

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[166] S. Wang, W. Ding, J. Li, *et al. Decentralized autonomous organizations: concept, model, and applications*, IEEE TRANS. COMPUT. SOC. SYST., 6 (5), pp. 870-878 IEEE, (2019).

[167] Ibid.

[168] Margaret J Wheatley & Myron Kellner-Rogers, *A Simpler Way,* BERRETT-KOEHLER PUBLISHERS 16, (1996).

[169] Ongweso Jr., E., *Democratic DAO suffers coup, new leader steals everything*, (2022).

[170] Margaret J Wheatley and Myron Kellner-Rogers, *A Simpler Way* (Berrett-Koehler Publishers, 1996) 16.

[171] Adam Greenfield, *Radical Technologies: The Design of Everyday Life* (Verso, 2017) 161, 162.
 "The IC is the study of how blockchains interact with our existing and future social institutions, from the nature of contracts to the shape of the firm, to the structures of global trade, all the way to the dynamics of capitalism and geopolitics"

[172] Supra note 66.

transaction cost economics of Ronald Coase, James Buchanan, Oliver Williamson, and Elinor Ostrom to blockchains'.[173] The evolution of current organizational forms and the introduction of new ones are all covered by IC.[174] As a result of the usage of blockchain (ledgers) to enable the development of new organizations, such as DAOs, traditional legal organization forms are unlikely to be sufficient to handle these ones.[175] As a result, existing legal organizational forms for DAOs would need to be modified or new legal organizational forms would need to be created. There is no single legal structure for DAOs, just as there is no unique governance mechanism for them. If DAOs utilize legal frameworks, they use a variety of legal structures.[176] While a DAO requires a governance structure to function, a DAO can operate without formalizing their legal structure, since most DAOs conduct their transactions online and do not interface with the legal system or regulated entities.[177] Despite the fact that most DAOs have not formalized their legal structure, the law is likely to impose one on them, just as it does on any other group of people. For profit DAOs, for example, are more likely to be discovered as partnerships.[178]

The partnership structure for DAOs has the drawback of not making the DAO a legal entity, which means it cannot enter into contracts, possess property, sue and be sued, or otherwise interact with the legal system.[179] If a third party or a DAO member wanted to sue a DAO[180], they would have to try to assert their rights against others linked with the DAO, such as other DAO token holders at a certain moment.[181] By obtaining DAO tokens through airdrops, individuals and organizations

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[173] Chris Berg, Sinclair Davidson and Jason Potts, *Understanding the Blockchain Economy: An Introduction to Institutional Cryptoeconomics,* EDWARD ELGAR, (2019).

[174] Ibid.

[175] Claude Ménard, *A New Institutional Approach to Organization*, IN CLAUDE MÉNARD AND MARY M SHIRLEY (EDS), *HANDBOOK OF NEW INSTITUTIONAL ECONOMICS* (2008) 281, 311.

[176] Kaal (n 47) 30*, explaining that legal designs for DAOs are still largely relegated to experimentation,* While Kaal uses the term 'legal design', this chapter uses the term 'legal structure'.

[177] Id ("DAOs, for example, do not require a bank account because they can deal using cryptocurrency.").

[178] Zetzsche, Buckley & Arner (n 39) 1400; and De Filippi and Wright (n 10) 141–142. See also Metjahic (n 10) who argues that DAOs should be recognised as partnerships to clarify how the law treats DAOs and their members.

[179] Ibid.

[180] Id.

[181] *Supra* note 141 ("Partners are not liable for the activities and debts of a DAO that occurred or were incurred before they became partners, nor are they liable for events that occurred after they left the partnership. There are, however, exceptions. A partner, for example, could be held accountable if a third party was unaware that the individual, they were dealing with was no longer a partner.").

may accidentally become DAO token holders. The possibility of token holders' liability causes uncertainty. Because of their possible liabilities and other parties' concern about their ability to enforce transactions, people and organizations may be less willing to be token holders. As a result, a legal framework other than a partnership should be considered for DAOs to reach their full potential. The legal framework and governance of a DAO are closely linked because different legal forms allow for various amounts of decentralization. As DAOs develop, they can change their legal structures, such as changing from centralized to decentralized legal frameworks.[182]

Furthermore, DAO regulation is difficult because DAOs are based on developing technology, particularly blockchain.[183] DAOs aren't widely used yet; some have failed, while others are still in the proof-of-concept stage. As a result, authorities must assess the level of regulation required to safeguard consumers and investors. The legal design of DAOs, and hence their legal regulation, is an example of the regulators' dilemma.[184] If regulations are implemented too soon, the benefits of new technology may be lost as innovation is inhibited.[185] However, if authorities wait too long, technology 'lock-in' or 'path dependency' might arise, and vested interests become too powerful.[186] DAOs may be able to create their own legal framework or structures, which courts and even Parliament may accept. Lawyers and corporations have used a bottom-up strategy of experimenting with legal frameworks that courts have later recognized throughout history.[187] The contemporary corporation, for example, is the result of evolving commercial practices that prompted legislators to respond.[188] There may also be regulatory competition. A jurisdiction might compete for business by recognizing legal structures that are appealing to businesses in the hopes that they will register there.[189] For instance, in response to France and the United States

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[182] Collingridge (n 104) and Anna Butenko and Pierre Larouche, *Regulation for Innovativeness or Regulation of Innovation*, 7(1) LAW, INNOVATION AND TECHNOLOGY 52, (2015).

[183] Christian Folks, *DAOs: To Be or Not To Be Regulated*, SSRN, (Nov 2021).

[184] Ibid.

[185] Chartered Accountants Australia & New Zealand, *The Regulator of 2030: Regulating our Digital Future* (2017).

[186] *Supra* note 176.

[187] Id.

[188] Ron Harris, *Political Economy, Interest Groups, Legal Institutions, and the Repeal of the Bubble Act in 1825,* (1997) 50 ECONOMIC HISTORY REVIEW 675 AND HARRIS, *The Private Origins of the Private Company*, (n 99).

[189] Mary Szto, *Limited Liability Company Morality: Fiduciary Duties in Historical Context*, 23(1) QUARTERLY LAW REVIEW 61, 64, (" The LLC in the United States was created first in Wyoming, specifically for an oil company") (2004)

recognizing such companies, the United Kingdom recognized the modern corporation with its independent legal existence and limited liability of stockholders.[190] The LLC was initially recognized in Vermont, United States in the 1970s[191], and it is now legal in practically every state in the country.[192] Indeed, in the United States, the LLC has become a prominent business legal form.[193] Regulatory competition, on the other hand, enhances the possibility of regulatory arbitrage.[194] In this sense, regulatory arbitrage refers to two things: first, when a company registers or operates (or both) in a country with more favorable rules;[195] second, governments are in a race to the bottom, in which they seek to provide the most favorable environment for DAOs to operate in, which involves loosening otherwise harsh rules.[196]To illustrate sufficiently, DAOs can also be 'wrapped' or 'unwrapped,' according to LexDAO and LAO, founder Aaron Wright.[197] 'Unwrapped' DAOs have no legal status and rely on their own internal digital dispute resolution methods to manage the organization.[198] Wrapped DAOs, unlike unwrapped DAOs, utilize existing legal frameworks to register the DAO as a company or other non-profit entity, granting it legal personality (such as a Delaware limited liability company [LLC]).[199]

There is no requirement for a single registered director or proprietor in a member-managed LLC.[200] Participants in these structures manage the company collectively with limited liability protection and are not held jointly and severally liable.[201] The member-managed LLC form meshes with the collective mechanics of DAOs to some extent and has proven useful in the early

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[190] Colin Mackie, *From Privilege to Right: Themes in the Emergence of Limited Liability*, 4 JURIDICAL REVIEW 293, 309, CITING HC DEB 29 JUNE 1855, VOL 139, COL 323, (2011).

[191] Wyoming Limited Liability Company Act, ch 158, 1977 Wyo Sess Laws 577 and see Hamill (n 102).

[192] Ibid.

[193] Mohsen Manesh, *Creatures of Contract: A Half-Truth About LLCS*, 42(2) DELAWARE JOURNAL OF CORPORATE LAW 391, 393, (2018).

[194] Joel F Houston, Chen Lin and Yue Ma, *Regulatory Arbitrage and International Bank Flows*, 67(5) JOURNAL OF FINANCE 1845, 1846, (2012).

[195] Heikki Marjosola, *The Problem of Regulatory Arbitrage: A Transaction Cost Economics Perspective*, 15 *Regulation and Governance* 388, (2019).

[196] Ibid.

[197] *Supra* note 151.

[198] SEC (2017). SEC issues investigative report concluding DAO tokens, a digital asset, were se- curities.
[199] Ibid.
[200] *Supra* note 119.

[201] Ibid.

phases of the space's evolution.[202] The legal foundations of the corporation are considerably amended for DAOs wrapped in these member-managed LLCs by altering the operating agreements to allow the DAO's communal design. Finally, through the inclusion of contractual arbitration clauses, the contractually altered operating agreements provide a level of legal enforceability to the DAO's actions.[203] If a dispute arises between DAO members, an arbitration provision will state that all issues between members must be addressed through DAO arbitration rather than the courts. In general, US courts will uphold such arbitration agreements and will render a state's enforcement measures ineffective. This may entail obtaining judicial orders to enforce the DAO arbitration decision.[204] DAOs can waive any fiduciary commitments that members of the DAO may have to one another under American law, limiting the prospect of joint and severable liability.[205]

C. Recognition of DAOs

This section examines legislatures' attempts to change LLC legislation to make registering a DAO as an LLC in their jurisdiction more attractive. US states have been among the most active jurisdictions in allowing DAOs, continuing a legacy of brave states *"try[ing] unprecedented social and economic experiments without danger to the rest of the country"*.[206] Wyoming was the first state to recognize

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[202] Ibid.

[203] W.A. Kaal., *Blockchain-based corporate governance,* STANFORD JOURNAL OF BLOCKCHAIN LAW & POLICY (ONLINE), (2021).

[204] Ibid.

[205] Del. Code Ann. tit. 6, s 18–1101(c).

[206] *New State Ice Co v Liebmann* 285 US 262 (1932) [50], quoted by Max Ganado et al, *Mapping the Future of Legal Personality*, MIT Computational Law Report (20 November 2020)

LLCs[207] and to expressly allow DAOs to register as LLCs in its jurisdiction.[208] The legislatures' attempts to accommodate DAOs belongs to three US states: Delaware, Vermont and Wyoming.[209] Those states have picked the LLC as the best legal structure for DAOs, and they've employed a variety of approaches to incorporate DAOs into their LLC statutes.[210]

Delaware has always maintained favorable LLC statutes that provide members with a significant high level of flexibility.[211] In 2017, Delaware modified its company code to allow for the storage of any records administered on one or more dispersed electronic networks or databases.[212]

Unlike Vermont and Wyoming, Delaware has not explicitly recognized the registration of DAOs. Despite Delaware's small step, Max Ganado et al suggest that the state will appeal to people seeking robust corporate protection, and Delaware will learn from other states' experiences and build on its initial action.[213] In part, the conservative approach has proven out, since The LAO has registered in Delaware.[214]

Vermont's LLC chapter[215] has been updated to explicitly embrace blockchain-based limited liability companies (BBLLC).[216] The BBLLC states:

(1) A BBLLC may provide for its governance, in whole or in part, through blockchain technology.

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[207] *Wyoming Limited Liability Company Act*, CH 158, WYO. SESS. LAWS 577 AND SEE HAMILL (n 94) 295, (1997).

[208] Bellavitis, Cristiano and Fisch, Christian and Momtaz, Paul P., *The Rise of Decentralized Autonomous Organizations (DAOs): A First Empirical Glimpse* (April 4, 2022).

[209] Tayros Consulting, *Decenetralized autonomous organization (organizzazione autonoma decentralizzata) DAO – aspettli legali e societari*, (2022).

[210] Max Ganado et al, *Mapping the Future of Legal Personality, (n 1658)*, ("Montana's move, however, is unlikely to be of assistance to DAOs as DAO tokens that carry voting rights will be considered governance tokens and not utility tokens.2).

[211] *Supra* note 201.

[212] 8 DE Code § 224 (2017), provided that the records could be converted into clearly legible paper form within a reasonable time.

[213] *Supra* note 180.

[214] Ibid.

[215] 11 V.S.A. § 4173 (Subchapter 012: Blockchain-Based Limited Liability Companies, which is part of Chapter 025: Limited Liability Companies, which is part of Title 11: Corporations, Partnerships and Associations).

[216] 11 VSA § 4173 and Higgins (n 113).

(2) The operating agreement for a BBLLC shall:

(A) provide a summary description of the mission or purpose of the BBLLC;

(B) specify whether the decentralized consensus ledger or database utilized or enabled by the BBLLC will be fully decentralized or partially decentralized and whether such ledger or database will be fully or partially public or private, including the extent of participants' access to information and read and write permissions with respect to protocols.

(C) adopt voting procedures, which may include smart contracts carried out on the blockchain technology, to address:

(i) proposals from managers, members, or other groups of participants in the BBLLC for upgrades or modifications to software systems or protocols, or both.

(ii) other proposed changes to the BBLLC operating agreement; or

(iii) any other matter of governance or activities within the purpose of the BBLLC;

(D) adopt protocols to respond to system security breaches or other unauthorized actions that affect the integrity of the blockchain technology utilized by the BBLLC.

(E) provide how a person becomes a member of the BBLLC with an interest, which may be denominated in the form of units, shares of capital stock, or other forms of ownership or profit interests; and

(F) specify the rights and obligations of each group of participants within the BBLLC, including which participants shall be entitled to the rights and obligations of members and managers.[217]

As a result, the BBLLC Act modifies Vermont's LLC law by explicitly allowing an organization to use its smart contracts for voting and hence governance. However, the BBLLC Act is limited because it still allows for the use of managers. Despite the limits of the BBLLC Act, 19 domestic BBLLCs were registered as of March 21, 2021.[218] The BBLLC in Vermont has the advantage of allowing overseas BBLLCs to register, therefore it is not limited to Vermont residents.[219]

Wyoming's Title 17 — Corporations, Partnerships, and Associations recently enacted the 'Wyoming Decentralized Autonomous Organizations Supplement' ('DAO Supplement').[220] The DAO Supplement, which recognizes DAOs as a new type of LLC, takes effect on July 1, 2021.[221] The DAO

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[217] *Supra* note 75.

[218] *Supra* note 201 (220 domestic BBLLCs had been registered, however, one has since been dissolved").

[219] *Supra* note 166.

[220] WS 17-31-101–17-31-115.

[221] *Supra* note 201.

Supplement is described as an *"Act pertaining to companies; providing for the formation and management of decentralized autonomous organizations; establishing definitions; and setting an effective date"*. Vermont's BBLLC legislation is more thorough than the DAO Supplement. In Wyoming, a DAO's registered name must include one of the following terms to indicate its status: DAO, LAO, or DAO LLC.[222] In Vermont, there is no necessity for an express statement in the DAO's name. It is prudent to require that a DAO openly state that it is a DAO in its name, as this would notify potential members and third parties of its position as a DAO without the need to search Vermont's commercial companies.[223] A 'limited liability company created under this chapter,' according to Wyoming's DAO Supplement, is a 'decentralised autonomous organization'.[224] As a result, the DAO Supplement is not a unique law; the Wyoming Limited Liability Company Act[225] applies to DAOs to the extent that it does not conflict with the DAO Supplement.[226] There are two sorts of DAOs: member operated and algorithmically managed.[227] Unless the DAO's articles of organization state otherwise, the DAO Supplement assumes that DAOs are member managed. Except as otherwise permitted by the DAO Supplement, a DAO's articles of organization and smart contracts[228] must control a wide range of things, according to the DAO Supplement. They include:

- The relations between members and between members and the DAO.
- The rights and duties of members.
- The DAO's activities and the conduct of those activities.
- The means and conditions for amending the DAO's operating agreement.

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[222] Id ("Only three of the DAOs registered in Vermont as BBLLCs on 31 March 2021 included the term DAO in their names.").

[223] Id.

[224] Ibid.

[225] Ibid (17-29-101-1105).

[226] Ibid (17-31-103(a)).

[227] Ibid (17-31-104(e)).

[228] *Supra* note 66 (17-31-102(a)(ix) defines a smart contract as an 'automated transaction, as defined in W.S. 40-21-102(a)(ii).)
["a transaction conducted or performed, in whole or in part, by electronic means or electronic records, in which the acts or records of one (1) or both parties are not reviewed by an individual in the ordinary course in forming a contract, performing under an existing contract or fulfilling an obligation required by the transaction"], or any substantially similar analogue, which is comprised of code, script or programming language that executes the terms of an agreement and which may include taking custody of and transferring an asset, administrating membership interest votes with respect to a decentralized autonomous organization or issuing executable instructions for these actions, based on the occurrence or nonoccurrence of specified conditions'.

- The procedure for amending the DAO's articles of organization.
- How membership interests are transferred and how members withdraw from the DAO.
- The procedures for amending, updating, editing or changing the DAO's smart contracts; and all other aspects of the DAO.

Therefore, the DAO Supplement must include the DAO's usage of blockchain. If records are published on a public blockchain, members, for example, have no right to inspect or copy them. To augment their articles of association and smart contracts,[229] DAOs are allowed to have an operational agreement.[230] As a result, the DAO Supplement acknowledges three things: the DAO's articles of incorporation, as well as its smart contract and operational agreement. DAOs, like all other Wyoming entities, must have a registered agent.[231] The agent does not have to be a human being; it could be a commercial registered agent.[232]A member would not need to be the DAO's registered agent or form the DAO if they could utilize a commercial registered agency. The DAO Supplement would allow DAOs in Wyoming to be founded and run for any lawful purpose, including profit.[233]However, in the United States, the practical capacity to form a not-for-profit LLC is limited because all its members must be not-for-profit entities, preventing natural people from forming one.[234] This restriction arises from the IRS's tax treatment of not-for-profit organizations in the United States, and it could be lifted.[235] Because the articles of organization, the DAO's smart contract, or the operating agreement can provide for voting rights, the DAO Supplement looks to allow complicated voting mechanisms.[236]

Three default rules apply if the DAO's smart contract or operational agreement do not provide for voting rights.[237] To begin, membership assets and thus voting rights are measured by deducting a

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[229] Ibid (17-13-112. The DAO Supplement uses the term 'open blockchain', which is defined in 17-31-102(a)(vii) as 'a blockchain as defined in W.S. 34-29-106(g)(i) that is publicly accessible and its ledger of transactions is transparent'.)

[230] Ibid 17-31-108.

[231] Ibid 17-31-105(b).

[232] Ibid 17-28-101(a)(D)(ii)(II), commercial registered agents provide services to at least 10 entities and have written agreements for the entities they represent.

[233] Ibid 17-31-105(c).

[234] David S Walker,*A Consideration of an LLC for a 501(c) (3) Nonprofit Organization*, 38(2) WILLIAM MITCHELL LAW REVIEW 640, 640–641, (2012).

[235] See generally, ibid.

[236] 17-31-111(a)(i)–(iii).

[237] Ibid.

member's contribution of digital assets to the DAO by the total amount of digital assets contributed to the DAO at the time of a vote.[238] Unless this rule is changed, only digital asset contributions are recognized, not other contributions to the DAO, such as performing work for a DAO.[239]A representation of economic, proprietary, or access rights that is recorded in a computer-readable format is referred to as a digital asset.[240] Second, if a member does not contribute digital assets in order to join, that individual will only have one membership interest and one vote.[241] The flexibility to adjust these default rules is crucial since it would allow for more complex voting methods. Third, a quorum would require a minimum number of voting membership interests.[242] Because it is difficult to ensure that at least 50% of valid votes are cast for any vote, the option to adjust this default rule is critical. In conclusion, limited partnerships, limited liability companies, limited liability partnerships, foundations, and associations all have limits. As the Dash DAO demonstrates, a variety of structures is feasible; however, people are assigned to certain jobs, resulting in centralization. LLCs are more promising for for-profit DAOs since they limit DAO members' liability and empower DAOs to craft the DAO's activities. Wyoming's DAO Supplement (for-profit-DAOs) and creating an unincorporated non-profit organization in various US states are the most suited legal structures for DAOs.[243]

Moreover, the DAO Supplement has been instrumental in better delineating the jurisdictional treatment of DAOs, which is currently complex. Those in favor of this development see it as just the first step in a new technological-corporate era.[244]

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[238] 17-31-111(a)(i).

[239] Stratis, *Different Ways to Distribute Reputation in a New DAO*, DAO TALK.ORG (May 2019).

[240] *Supra* note 201 (Wyoming 34-29-101).

[241] Ibid 17-31-111(a)(ii).

[242] Ibid.

[243] Jdsupra (2021). Decentralized Autonomous organizations find a home in Wyoming.

[244] *Supra* note 201 ("Due to the Treaty of Friendship, Commerce and Navigation between the Federal Republic of Germany and the United States of America of 29 October 1954, this law also has concrete effects on the German and European corporate landscape. That is, a DAO LLC from Wyoming is also recognised in Germany as a limited liability company and can operate in Europe.").

III. Is Blockchain the right choice?

A. The international approach

Where the DAO has no country of incorporation, seat of governance, or principal office, the jurisdictions of decentralised autonomous organizations (DAOs) are the problematic and challenging aspect. The jurisdiction that applies to entities under existing legal systems is generally dependent on the location of incorporation (incorporation theory) or the place where the organization's important management decisions are made (real seat theory). Another option would be to allow people to choose their own forum. The issue of taxation would still be present there. The first option, which is widely used in the DeFi ecosystem is represented by an ecosystem where transactions are validated by a decentralised peer-to-peer (point-to-point) network rather than a central authority), is to not create a legal entity at all and instead try to create a completely decentralized structure. This does not, however, imply that decentralised autonomous organizations (DAOs) without a legal body are operating illegally. They will be viewed as general partnerships in most jurisdictions, with the attendant legal consequences, the most prominent of which being the risk of personal culpability for each participant. However, because the DAO has a legal personality, it can lawfully possess assets and even employ people in most jurisdictions. Although the DAO has not been registered, the members have formed a fully recognized legal entity that can sue and be sued in most jurisdictions. Although, as previously said, there are major risks involved. In some locations, this structure also employs regulatory arbitrage. Anonymous law enforcement becomes more difficult when there is no central organization engaged and the project is really decentralized and begun. Even the Securities and Exchange Commission (SEC)[245], has acknowledged that the more decentralized a project is, the less likely the underlying tokens will be classified as securities.[246]

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[245]Id ("The US federal agency in charge of stock exchange regulation").

[246] Adam Greenfield, *Radical Technologies: The Design of Everyday Life,* 161, 162, (2017).

Furthermore, as far as private international law is concerned, finding the applicable law and the responsible regulatory authority can be rather difficult in the case of a fully decentralised DAO. Because the cooperation agreement between the participants in DAOs with economic interests is sufficiently consolidated based on conflict of laws, the linking rules of international company law must be applied. In the case of DAOs, the norms of international company law approach their limits if no express choice of law is made. DAOs run on every node of a blockchain, everywhere and nowhere, unlike traditional software applications that reside on a specific server under the supervision of an operator allocated to a specific jurisdiction. DAOs, unlike traditional organizations, are jointly managed by a dispersed network of peers contributing to the underlying blockchain-based network from anywhere in the globe.[247] Because the spatial center of gravity cannot be found, a decentralized blockchain network, such as a DAO, is fundamentally opposed to the traditional search for the map center under private international law. Traditional theories for determining jurisdiction for companies in most jurisdictions are related to the place of incorporation and to the administrative centre. This isn't very beneficial in the case of a DAO because both places are generally impossible to determine. Other reference points, on the other hand, approach their limitations.[248] As a result, the principle 'Lex loci rei sitae'[249] premise cannot be applied. If the site can be determined and a contract exists in the legal sense, one possible option would be to decide the appropriate law based on the jurisdiction of the other contractual party. However, this technique does not assist in determining a DAO's legal standing in the first place. Finally, the principle of 'Lex Fori'[250] could always be relied upon. This refers to the substantive law of the state, nation, or jurisdiction in which an action or remedy is sought. Apart from the legal-theoretical difficulties that Lex Fori raises, its application clashes with several practical considerations owing to the DAO concept.[251]

As a result, determining the appropriate law for DAOs and hence the competent jurisdiction and regulatory authority is challenging, which makes enforcement difficult as well. Determining whether

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[247] *Supra* note 201.

[248] *Supra* note 75 (For instance, the resources of a decentralised autonomous organization are, if it consists only of digital currency, spread all over the world.)

[249] Id ("The law of the location where the property is located").

[250] *Supra* note 167 ("The lex fori indicates, in the legal sphere, the application of the rules of the legal system to which the judge belongs. Usually used as an expression in cases of conflict of laws, in the field of private international law").

[251] Id ("For instance, litigants may have to file actions in several jurisdictions to obtain legal protection, and litigation against a DAO may become very impractical from an economic point of view.").

a project is sufficiently decentralized to evade regulatory scrutiny for unregistered securities sales is a delicate and difficult task. There is no single criterion that will determine this; thus regulators will consider all the conditions.[252]

The most used jurisdictions are Switzerland and the Cayman Islands. Compared to other European jurisdictions, Switzerland offers a more flexible foundation model with a relatively simple set-up and moderate taxation.[253] The Cayman Islands is another jurisdiction that many cryptocurrency projects have chosen because of its reasonable grounds. The legal form of a so-called "Foundation company,"[254] which was introduced as a new structure by the 2017 Act, is of particular significance. The foundation company is a very versatile vehicle that functions as an incorporated trust, allowing it to serve as a civil law foundation or a common law trust while maintaining the legal personality, restricted liability, and tax neutrality of a corporation. Beneficiaries who are not considered beneficiaries under a statutory or common law trust arrangement may be designated by the foundation corporation. The reason for this is that under the Act, a designated beneficiary has no rights or powers against the foundation company save those that the foundation company specifically declares. Furthermore, under the legislation, a foundation company is not obligated to preserve a record of its recipients' legal names. It may designate beneficiaries by class of people, such as 'token holders' or 'node operators,' and reward them based on that class. Although AML[255] implications must always be kept in mind, this could be handy for DAOs that want to give out distributions, token airdrops, or other benefits to their community.[256] These events and observations hint at the interest that has been created in these entirely innovative decentralised organisations and indeed, although the impact and influence they will have on the corporate sector in the long term cannot yet be established, it can already be noticed how many jurisdictions are changing according to this evolution.[257]

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[252] T Cuk and A van Waeyenberge, *European Legal Framework for Algorithmic and HighFrequency Trading (Mifid 2 and MAR) A Global Approach to Managing the Risks of the ModernTrading Paradig'* 9 EJRR 146, (2018).

[253] *Supra* note 201.

[255] Bauer, Bridgett S, *Airdrops: "Free" Tokens Are Not Free from Regulatory Compliance*, 28(2) University of Miami Business Law Review, (2020).
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[256] Ibid ("Anti-money laundering regulations aim to prevent the entry of criminal resources into the economic system. By intercepting and impeding criminal proceeds, the anti-money laundering system helps to suppress illegal activities.").

[257] See Appendix A to analyze the fast evolution of DAOs in recent years (source Appendix A see *supra* note 75).

V. Conclusion

In conclusion, the framework so far has enabled us to grasp the degree of novelty and some of the problematic aspects of decentralized autonomous organizations, which have completely disrupted today's corporate conception. The particularly of the DAO is its operation: it is not like any other ecosystem already created in the crypto space.[258]

Moreover, the blockchain-based-nature of these organizations has numerous implications that distinguish DAOs from traditional ones. First, the organizational governance and secondly, the decentralized nature of DAOs which enables new business models that are catalysts for further disintermediation. Its features make it possible to manage the business world in a way never imagined before. Currently, several steps have already been taken toward this societal innovation, despite difficulties regarding its regulation.[259] The US states have been among the most active jurisdictions in allowing DAOs; in fact, the most significant attempts were in the state of Wyoming, Delaware and Vermont. The only one that really regulated DAO was Wyoming, which passed a law on July 1st 2021, the 'Wyoming Decentralized Autonomous Organizations Supplement', by the state of Wyoming, which finally granted recognition legal status to this entity. This law has also had a great impact on other jurisdictions, especially Germany and Europe, and attracted the attention of countries that are still backward about this system.

What is certainly certain is that DAOs represent how technological development, with its instrumental role, has managed to influence the corporate system to such an extent, as it has already begun to do with the legal one as well. The DAO is still a wide source of debate, especially because it is an organization based on new and developing technologies that are evolving every day in step with our society today. Therefore, it is not clearly delineated what role will have these organizations in the long-term future; however, they do mark the beginning of a new era, where individuals

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[258] Vishal Marria, *The Future of Artifical Intelligence in The Workplace*, Forbes, (11 january 2019).
[259] Bauer, Bridgett S, 'Airdrops: "Free" Tokens Are Not Free from Regulatory Compliance' (2020) 28(2) *University of Miami Business Law Review* 311

themselves become aware that the tools at their disposal are update and new methods emerge to be able to evolve society. One does not predict the future, but after such analysis a question arises: 'Is DAO the corporate future?'.

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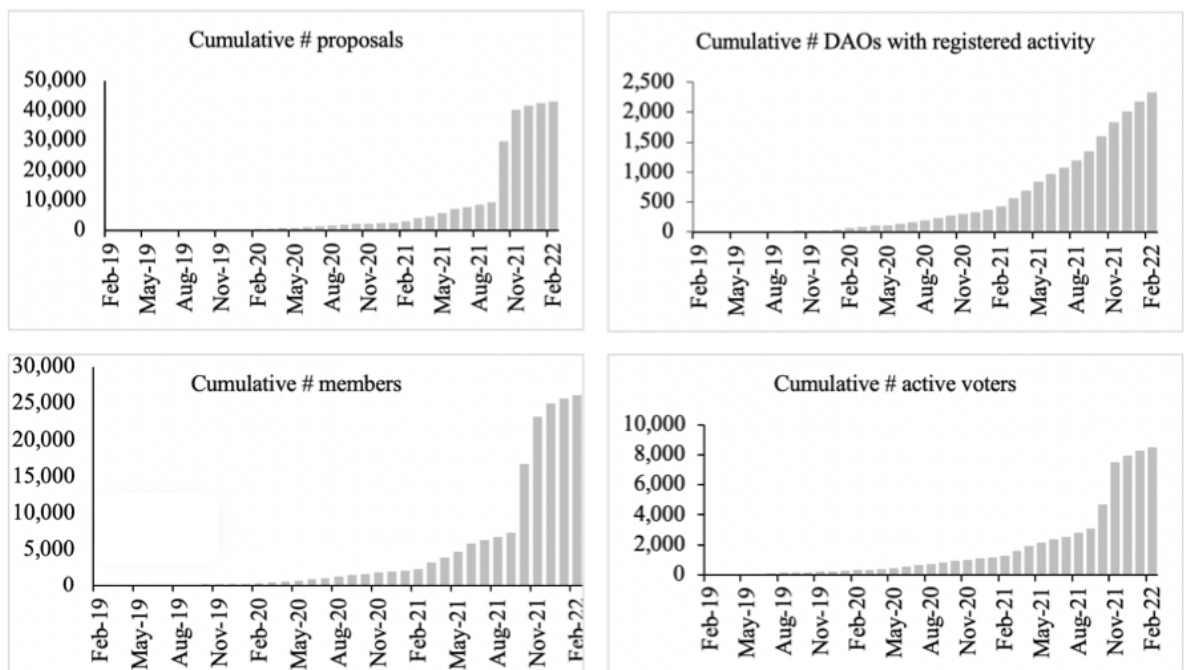- Fisch, C., & Momtaz, P. P. (2020). Institutional investors and post-ICO performance.

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Appendix A:

Figure 1: The Evolution of DAOs, Members, Proposals, and Active Voters

Appendix B:

Figure 3: The Governance of DAOs

Ownership threshold for proposals

DAO Networks

Governance Strategies