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Decentralized autonomous organizations: adapting legal structures and proposing a new model of DAOLLP

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Abstract

This article examines the integration of Decentralized Autonomous Organizations (DAOs) into the existing legal framework of the United Kingdom, proposing a novel legal entity model termed the Decentralized Autonomous Organization Limited Liability Partnership (DAOLLP). It explores the distinctive characteristics of DAOs, including their decentralized governance, reliance on smart contracts operating on blockchain and the challenges they face under current UK law and underscores the necessity for legal adaptations that accommodate these innovative structures. The suggested model seeks to provide legal personhood, limited liability protection and a framework for compliance with existing laws and regulations while maintaining the core principles of decentralization and transparency. By comparative analysis of legislative approaches towards DAOs in jurisdictions such as Wyoming, Vermont and Malta, this article promotes a proactive regulatory framework for DAOs that fosters innovation and positions the UK as a leader in blockchain governance.

Introduction

The fast evolution of blockchain technology has led to the emergence of DAOs. Blockchain technology is a decentralized digital ledger that records transactions across network computers (nodes), ensuring data security, transparency, and immutability. In contrast to traditional databases controlled centrally by a single organization, blockchain is served by a network of computers, making it resistant to centralized points of failure.[1] Transactions are recorded on a public ledger to which the public has access, which cannot be altered or deleted, thus ensuring the integrity of the data. They are secure because they are encrypted and linked together in blocks, making it difficult to make changes, and they are supported by smart contracts, which are self-executing with the terms of the contracts written into code that automatically executes and enforces the agreed terms. Blockchain is a versatile technology underpinning various fields of activity, including finance and healthcare.[2]

Automation through self-executing smart contracts results in efficiency, reduces the risk of human error, and increases stakeholder trust. Although there are some concerns about the enforceability of smart contracts due to the nature of contract formation, interpretation, and dispute

[1] Min Xu, Xingtong Chen and Gang Kou, 'A systematic review of blockchain' (2019) 5 *Financial Innovation* 27, <https://jfin-swufe.springeropen.com/articles/10.1186/s40854-019-0147-z> accessed 27 December 2024, 5. Investopedia, 'Blockchain Facts: What Is It, How It Works and How It Can Be Used', <https://www.investopedia.com/terms/b/blockchain.asp> accessed 27 December 2024, 5.

[2] Mahima Habil, Saransh Kumar Srivastav and Pooja Thakur, 'Mapping the landscape of blockchain technology: a bibliometric analysis' (2024) 7 Journal of Computational Social Science 1533, <https://link.springer.com/article/10.1007/s42001-024-00280-9> accessed 27 December 2024, 1540.

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settlement, the English common law can deal with such issues adequately by addressing the fundamentals of contract theory.[3] The immutability of blockchain transactions is that once the smart contract is executed, it cannot be changed due to error, mistake, or unforeseen circumstance. Because the contract terms are written in the code, the parties are aware of that, and smart contracts are self-executed according to those terms. Again, common law can deal with the matters under the theory of contract law.[4]

The emergence of DAOs requires thoroughly examining their implications for the existing legal framework. Central to DAOs are the two principles of decentralization and blockchain governance. Decentralization is a foundational concept in technology and organizational theory where decision-making power is distributed among participants and does away with a central authority.[5] This contrasts with traditional governance models, which are hierarchical and epitomizes central control. Blockchain governance further challenges existing governance models by providing transparency, immutability, and accountability through the recording of all transactions.[6] The algorithm-driven characteristics of DAOs fundamentally challenge the traditional concepts of personhood used for corporations and LLPs.

This article discusses foundational legal theories for integrating DAOs into the English legal framework. Corporate governance theory is about how corporations are governed and controlled and provides the mechanism through which the processes of DAOs may be assessed.[7] Contract theory provides the mechanism for forming, interpreting, and enforcing contracts. It is relevant given the DAOs' reliance on self-executing smart contracts with coded terms.[8] Organizational theory focuses on the structures and systems within entities to provide an understanding of how DAOs function without central control, as it relies on decision-making by the members assisted by blockchain technology.[9] Based on understanding these theories, the article proposes a new legal entity model, the Decentralized Autonomous Organization Limited Liability Partnership (DAOLLP), which proposes harmonizing UK corporate law principles with the unique attributes of DAOs.

DAOs are akin to corporations[10] that are structured and governed differently. They function through smart contracts on the blockchain and provide an alternative business organization model to existing structures such as companies and LLPs. DAOs are member-owned organizations without a central leadership and are governed collaboratively by members' voting rights on the blockchain.[11] They offer transparency, democratic decision-making, and lower operational costs[12] and have emerged as a transformative economic force.[13]

Due to their unique characteristics, integrating DAOs into the UK legal system is challenging. The system must evolve to accommodate DAOs so that they can operate and preserve their distinctive characteristics.[14] This necessitates the creation of an innovative DAO model or structure

[3] Alec Klimowicz, 'The Age of Autonomy: The Automatic Self-Executing Contract Battles the Automatic Stay', Illinois Journal of Technology and Privacy (2024) 179, <https://illinoisjltp.com/file/255/Klimowicz_Final.pdf> accessed 27 December 2024, 189.

[4] Gavin Wood, 'Ethereum: A Secure Decentralised Generalised Transaction Ledger' (2014) *Ethereum Project Yellow Paper*, <https://ethereum.github.io/yellowpaper/paper.pdf> accessed 14 November 2024, 19.

[5] Joana R Pereira and Giselle Garcia, 'DAOs: Governance in the Blockchain Era', *IntechOpen* (2023) <https://www.intechopen.com> accessed 18 January 2025.

[6] Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008) <https://bitcoin.org/bitcoin.pdf> accessed on 18 January 2025.

[7] Bob Tricker, *Corporate Governance: Principles, Policies, and Practices* (3rd edn, OUP 2019).

[8] Kevin Werbach and Nicolas Cornell, 'Contracts Ex Machina' (2017) 67 Duke Law Journal 313.

[9] Richard L Daft, *Organization Theory and Design* (11th edn, Cengage Learning 2012) 123.

[10] S Hassan and P De Filippi, 'Decentralized Autonomous Organization' (2021) 10 Internet Policy Review <https://doi.org/10.14763/2021.2.1556> accessed 20 December 2024.

[11] UW Chohan, Decentralized Autonomous Organizations (DAOs): Their Present and Future (March 8, 2024). SSRN: <https://ssrn.com/abstract=3082055> or <http://dx.doi.org/10.2139/ssrn.3082055> accessed 12 December 2024.

[12] Law Commission, Decentralised Autonomous Organisation: A Scoping Paper (2023) 29.

[13] Nakamoto (n 6). Vitalik Buterin, 'A Next-Generation Smart Contract and Decentralized Application Platform' (2013) <https://ethereum.org/en/whitepaper/accessed> 1 September 2024. Aaron Wright and Primavera De Filippi, 'Decentralized Blockchain Technology and the Rise of Lex Cryptographia' (2015) 1 Stanford Journal of Blockchain Law & Policy 1. Aaron Wright, 'The Rise of Decentralized Autonomous Organizations: Opportunities and Challenges' (2021) Stanford Journal of Blockchain Law & Policy 45. Ana G Cardoso, 'Decentralized Autonomous Organizations—DAOs: the Convergence of Technology, Law, Governance and Behavioral Economics' (2023) MIT Computational Law Report 12. CryptoDose, 'A Complete History of DAOs | Timeline 1960s to Now' (2023) 34.

[14] Michael Schillig, 'Decentralized Autonomous Organizations (DAOs) under English Law' (2022) 16 Law and Financial Markets Review 68, 70. See Joseph Lee and Rougang Li, 'Law and Regulation for Decentralised

based on the contours of structures such as companies or LLPs that harness their potential to revolutionize governance and organizational structure suitable for the current digital economy.

This study explores and suggests how English law can evolve to accommodate DAOs' new model in the UK legal framework. It explores the intersection of blockchain technologies and the English legal system, identifies the evolution of existing business structures such as companies and LLPs, identifies the necessary way of adaptation, and introduces an innovative legal entity tailored to the unique needs of DAOs in English law.[15]

The research objectives are to examine DAOs' unique characteristics and governance challenges, identify the limitations of existing UK legal frameworks in accommodating DAOs, propose a new legal and organizational model, explore the role of smart contracts in ensuring legal compliance and addressing cross-border legal challenges, and assess the necessity of international regulatory collaboration. These objectives provide a comprehensive framework for effectively integrating and regulating DAOs within the UK legal system and position the UK as a leader in blockchain technology, attracting investment and promoting economic growth.[16]

The study unfolds into two parts: Part 1: Understanding DAOs and Their Challenges to Existing UK Corporate Legal Structures, and Part 2: Adapting Existing Legal Structures to Accommodate DAOs and Proposing New Legal Model for DAOs.

1. Part 1: Understanding DAOs and their challenges to existing UK corporate legal structures

While the four characteristics of DAO are well established,[17] the evolution of DAOs continues unabated, with more intensity since the hacking of The DAO (2016). It had raised over $50 million. The Ethereum community repaired the damage by implementing a hard fork of the Ethereum blockchain. The issue was resolved by splitting the blockchain into two chains.[18] The new chain was used to reverse the effects of the hack and return the stolen money. At the same time, the original chain continued to operate as Ethereum Classic (ETC) without reversing the hack.[19]

However, the hack proved to be a learning experience for the blockchain community because it exposed the shortcomings of the smart contract code and thus its vulnerabilities.[20] The community sought to improve the security and governance of DAOs, resulting in resilient DAO frameworks used in various sectors such as DFI and philanthropy. The hack precipitated the evolution of DAOs. Incidentally, the hack also drew the attention of regulators worldwide, focused on the legal status of DAOs.

Several DAOs have gained importance due to their methods and effects. The following examples demonstrate the diverse applications and effects of DAOs in the blockchain ecosystem, from financial stability and trading innovation to governance and community funding. MakerDAO is significant in the decentralized finance (DeFi) space. The DeFi platform manages stablecoin DAI, which is pegged to the US dollar. Its stable nature permits users to engage in financial activities to borrow and lend assets on the blockchain without intermediation and volatility, which is usually expected in cryptocurrency trading.[21] MolochDAO is a grant-giving DAO with an effective

Autonomous Organisations (DAOs)' Section 3 (SSRN, 22 May 2023) <https://ssrn.com/abstract=4455052> accessed 18 July 2024.

[15] Christina Fleming, 'Wrapping the DAO: Decentralised Autonomous Organisations under English Law', *TwoBirds* (2024), <https://www.twobirds.com/en/insights/2024/uk/wrapping-the-dao-decentralised-autonomous-organisations-under-english-law> accessed 9 July 2024, 12.

[16] Jonathan Greenacre, 'Regulating Decentralised Autonomous Organisations: A New Model for English Law' (2023) 43 Oxford Journal of Legal Studies 501.

[17] Nils Augustin Andreas Eckhardt and Alexander Willem de Jong, 'Understanding Decentralized Autonomous Organizations from the Inside' (2023) 33 Electronic Markets 38, see 'theoretical Background' section, <https://doi.org/10.1007/s12525-023-00659-y> accessed 18 July 2024.

[18] See Part 2 (2) (a). Aaron (n 13) 15

[19] David Z Morris, 'The DAO Hack: How a $60M Ethereum Attack Shaped Crypto History' *CoinDesk* (9 May 2023) 2–4 <https://www.coindesk.com/consensus-magazine/2023/05/09/coindesk-turns-10-how-the-dao-hack-changed-ethereum-and-crypto/> accessed 23 July 2024.

[20] Cristiano Bellavitis, Christian Fisch and Paul P Momtaz, 'The Rise of Decentralized Autonomous organizations (DAOs): a First Empirical Glimpse' Section 1 (SSRN, 7 June 2022) <https://ssrn.com/abstract= 4074833> accessed 12 July 2024.

[21] Mike Shin, The Ultimate Guide to DAOs <https://blog.thirdweb.com/what-is-a-dao/> accessed 6 October 2024.

governance model.[22] It funds Ethereum development projects and streamlines pooling resources and funding initiatives that benefit the broader Ethereum community. Uniswap is a decentralized exchange governed by UNI token holders. Uniswap has transformed the operation of decentralized exchanges by introducing an automated market maker (AMM) model. Users can trade cryptocurrencies directly from their wallets, improving liquidity and accessibility in the DeFi ecosystem.[23] Aragon is a platform that provides tools for creating and managing DAOs, aiming at ease of use and flexibility.[24]

Legal status

Although DAOs exist and perform within the English legal system, their legal status as partnerships, LLPs, or limited liability companies is unclear. Therefore, identifying a person responsible for a contract breach in a DAO can be difficult. Understanding the legal status of DAOs is important, and understanding each DAO's activities and characteristics is essential for modifying the law to accommodate them.

UK law recognizes various types of business organizations, including limited liability companies and limited liability partnerships (LLPs). Both entities have the legal status of a legal person with a separate legal personality.[25] This means they have the legal capacity to enter into contracts, own property, sue or be sued in their name, or be liable in law. Regulatory bodies such as the Financial Conduct Authority (FCA) and Companies House oversee them. The Companies Act 2006 oversees business organizations' formation, operation, and dissolution. The Limited Liability Partnership Act 2000 directs the formation and regulation of LLPs in the UK. Its structure combines a partnership's flexibility with a company's limited liability. The general partnership and limited partnership (LP) are as follows: the former is without a separate legal personality and the latter, although they have a separate legal personality, cannot exist perpetually, like a limited company or LLP. LPs are governed by the Limited Partnerships Act 1907.[26] General partnerships are governed by the Partnership Act 1890. A general partnership does not require formal registration, and it is automatically formed when two or more persons engage in a business activity for profit.[27]

The doctrine of legal personhood has evolved over the centuries, giving entities the capacity to have rights and obligations. It has also adapted to the changing nature of businesses and organizational structures. Originally, the concept of personhood was associated with a natural person. However, it evolved to include corporations accepting them as legal entities separate from their members, that is, shareholders. This evolution was necessary for the corporations to enter into contracts, own property, be liable for their actions separate from their shareholders, and sue or be sued.[28] The seminal case of Salomon v Salomon[29] anchored the principle that the corporation is a legal person distinct from its shareholders and has its own rights and obligations.

Affecting the doctrine of legal personhood to DAOs is challenging due to their decentralized and autonomous character. Corporations and LLPs operate under centralized leadership. Conversely, DAOs rely on blockchain and self-executing smart contracts to function through distributed governance. The concept of decentralization raises the issue regarding the assignment of liability within DAOs because of the lack of a central authority that can be held accountable.[30] Due to the absence of legal personhood, contract enforcement and dispute resolution become problematic, as in cases such as the 2016 The DAO hack.[31] However, the evolution of personhood is necessary, as was the case with limited liability for the DAOs to enter into

[22] J Zapata Sevilla, 'Analysing Decentralised Autonomous Organisations (DAOs): Limits and Perspective' (2024) Journal of Banking Regulation 1.
[23] Hayden Adams, 'Uniswap White Paper', <https://uniswap.org/whitepaper.pdf> accessed 18 August 2024, 15.
[24] Guneet Kaur (ed), 'Types of DAOs and How to Create a Decentralized Autonomous' Organization (Cointelegraph, 2 May 2023, 21 February 2024) <https://www.cointelegraph.com/types-of-daos> accessed 6 October 2024.
[25] *Salomon v Salomon* [1897] AC 22. Eva Micheler, 'Separate Legal Personality—An Explanation and a Defence' (2024) 24 Journal of Corporate Law Studies 301.
[26] See s 4 of the Limited Partnership Act 1907 for an LP's definition and formation.
[27] See ss 1 and 2 of the Partnership Act 1890.
[28] M Blumberg, *The Doctrine of Legal Personhood* (OUP 1993).
[29] *Salomon v Salomon* & Co Ltd [1897] AC22.
[30] Text to n 17.
[31] Text to n 19.

contracts, own property, be liable for their actions separate from their members, and sue and be sued.

The revaluation and expansion of the principle of legal personhood are essential to accommodate DAOs in UK law. The only way the law can provide a framework for DAOs' accountability and liability is to accept them as distinct legal persons similar to corporations and LLPs. Under the principle of *Salomon v Salomon*, such identity would allow them to enter into contracts, own property, and be accountable and liable for their actions. The evolution of this principle would allow DAOs to participate in economic activities, promoting innovation and growth in the digital economy.

DAOs, in contrast, differ from conventional business organizations. The term 'DAO' refers to different types of organizations, not a single type. There are many variations, and there is no agreement on what qualifies as a DAO, making it difficult to define them in law.[32] A primary concern is who is responsible if something goes wrong. For instance, if a DAO loses assets or money or is involved in a legal dispute, it is uncertain whether the DAO itself, its members, or both could be held liable.[33] This leads to how DAOs might be categorized under UK law. As they do not fit into traditional legal models like companies and LLPs, it raises the question of how they should be treated in law.

A notable problem is that DAOs need to be recognized as legal persons under UK law. They do not have legal personality in the same way as a limited company or LLP. DAOs are unincorporated associations[34] and general partnerships that enter into contractual relationships. Hence, their members are personally liable for the DAO's actions and obligations.[35] DAOs' lack of legal status and capacity creates problems for counterparties, who will not be sure with whom they are contracting. Typically, contracts are entered into by individuals or entities on behalf of the DAO, which complicates contractual enforcement and dispute resolution. If the DAO contracts with a third-party service provider and then fails to honour its obligations, the service provider may encounter difficulties in pursuing legal recourse. In the absence of a recognized legal person to hold liable, the service provider might have to pursue individual members of the DAO who could be dispersed across many jurisdictions. This complicates the enforcement of contracts and exposes individual members to personal liability, possibly preventing participation in DAOs.[36]

The UK Law Commission accepts the complexities involved while proposing that many DAOs can be effectively incorporated into existing legal frameworks, such as the Financial Services and Markets Act 2000.[37] The prevailing judicial view is that DAOs are more likely to be treated as general partnerships,[38] which exposes members of a DAO to personal liabilities.

Governance and operations

Traditional organizations operate through historically developed structures embedded in laws such as the Companies Act 2006, and their governance has a hierarchical management model in which boards of directors and managers make decisions.[39] In contrast, DAOs operate on a decentralized blockchain model,[40] where decision-making is distributed among all members through blockchain-based smart contracts.[41] Blockchain technology automates processes,

[32] Law Commission, Decentralised Autonomous Organisations: A Scoping Paper (2023) 29. This paper broadly categorizes DAOs into Pure DAOs and Hybrid Arrangements. The former is fully decentralized with no traditional legal structure and the latter combines elements of DAOs with traditional structure.

[33] Law Commission (n 32).

[34] An unincorporated association is governed not by statute but by general contract and trust law principles. It does not have separate personalities in law.

[35] Law Commission (n 32).

[36] Aaron Wright and Primavera De Filippi, 'Decentralized Autonomous Organizations: Beyond the Bitcoin Paradigm', in *The Governance of Blockchain Systems: A Legal and Techno-Social Analysis* (OUP 2020) 162.

[37] Law Commission (n 32).

[38] Christina Fleming, 'Wrapping the DAO: Decentralised Autonomous Organisations under English Law', *TwoBirds* (2024), <https://www.twobirds.com/en/insights/2024/uk/wrapping-the-dao-decentralised-autonomous-organisations-under-english-law> accessed 21 December 2024), 12.

[39] *D'Jan of London Ltd v A* (1994) 1 WLR 1234.

[40] AG Cardoso, 'Decentralized Autonomous Organizations—DAOs: the Convergence of Technology, Law, Governance and Behavioral Economics' (2023) MIT Computational Law Report 5–10 <https://law.mit.edu/pub/decentralizedautonomousorganizations/release/1> accessed 18 July 2024.

[41] Bellavitis, Fisch and Momtaz (n 20).

ensures transparency and accountability, and reduces agency problems.[42] Transactions and decisions are recorded on the blockchain, making them unchangeable and publicly available. Such a system of operations is not possible in traditional organizations. This governance model consists of a token-based voting system. DAOs use consensus mechanisms where token-holding members exercise the power to vote on proposals. This ensures collective decision-making without the existence of a central decision-making authority.[43]

There are strengths and weaknesses to the token-based voting system. The strengths are, first, that it is democratic as it emphasizes the decentralization of DAOs. It allows all members to vote and make decisions without a central authority. Second, blockchain technology enables all voting to be transparent and publicly verifiable, enhancing members' trust. Third, the system works efficiently as it conducts voting through smart contracts, and fourth, as token holders are investors in the DAOs, they are incentivized to participate in the voting system to protect their investment.[44]

Its weaknesses are, first, that it is susceptible to manipulation because decentralization makes it difficult to hold individual token holders accountable for their decisions.[45] Second, the system is vulnerable to manipulation by wealthier participants who can unfairly accumulate more tokens with voting rights than others. This can lead to collusion or vote buying by wealthy token holders, undermining the integrity of the voting process.[46] Such a practice would allow them to unfairly enhance their voting power and affect governance, leading to the centralization of power, which would be undemocratic and contradict the ethos of decentralization and lead to governance problems.[47] Third, although blockchain technology makes things transparent, participating individuals are anonymous, making it hard to trust them and determine accountability. This increases the risk of fraud and can impact governance.[48] Fourth, decentralization may result in a lengthier decision-making process and difficulties in reaching consensus.[49] It may also be difficult to achieve a quorum, as many token holders may not be interested in or able to participate in voting consistently.[50] These weaknesses add to the complexity, making enforcing regulations and ensuring compliance with the law more difficult. However, some alternative models to the token-based system could improve governance and accountability.

A quadratic voting system allows participants to use voting credits to demonstrate their feelings about an issue. Instead of one token, one vote, participants can vote based on their strength of preference and can use multiple votes in favour of essential issues. The cost of each additional vote increases quadratically, which is instrumental in controlling the participant's behaviour. It ensures that minority voices are heard and valued by promoting a more balanced decision-making process and preventing dominance by large stakeholders.[51]

The liquid democracy voting system, which continues with the theme of inclusivity and empowering minorities, permits participants to vote on proposals directly or through proxies.

[42] Anne Lafarre and Christoph Van der Elst, The Viability of Blockchain in Corporate Governance (European Corporate Governance Institute—Law Working Paper No 712/2023, 9 June 2023) <https://ssrn.com/abstract=4483621>

[43] Primavera De Filippi and Aaron Wright, *Blockchain and the Law: The Rule of Code* (Harvard University Press 2018) 195.

[44] Samantha Radocchia, 'Token-Based Voting in Decentralized Autonomous Organizations: A Critical Analysis' 12 (2023) Blockchain Governance Review 67, <https://blockchaingovernancejournal.org/article/5678> accessed 22 May 2024, 78.

[45] Usman W Chohan, 'The Decentralized Autonomous Organization and Governance Issues' (2017) SSRN <https://ssrn.com/abstract=3082055> accessed 15 July 2024. See Olivier Rikken, Marijn Janssen and Zenlin Kwee, 'Governance Impacts of blockchain-based Decentralized Autonomous Organizations: An Empirical Analysis' (2023) 6 Policy Design and Practice 465. See Bellavitis, Fisch and Momtaz (n 20).

[46] Angela Walch, 'The Path of the Blockchain Lexicon (and the Law)', *Review of Banking & Financial Law* (2019) 36 713, <https://www.bu.edu/rbfl/files/2019/12/Walch-The-Path-of-the-Blockchain-Lexicon.pdf> accessed 12 July 2024.

[47] Rikken, Janssen and Kwee (n 45) 465. See Oladejo MT and Jack L, 'Fraud Prevention and Detection in a Blockchain Technology Environment: Challenges Posed to Forensic Accountants' (2020) 9 International Journal of Economics and Accounting 315.

[48] Walch (n 46).

[49] Law Commission, Decentralised Autonomous Organisations (DAOs): A Scoping Paper (Law Com No 123, 2024) 24 <https://cloud-platform-e218f50a4812967ba1215eaecede923f.s3.amazonaws.com/uploads/sites/30/2024/07/DAOs-scoping-paper-110724.pdf> accessed 28 July 2024.

[50] Walch (n 46).

[51] XDAO, 'DAO Voting Mechanisms and Systems: A Deep Dive' (XDAO Blog, 13 April 2023) <https://blog.xdao.app/unleashing-the-power-of-dao-voting-a-deep-dive-into-dao-voting-mechanisms-and-systems-4d4ece7aed36> accessed 1 August 2024.

This model benefits from direct and representative democracy. It ensures the representation of those participants who do not have the time or expertise but are still represented. It demonstrates efficiency, flexibility, and accountability.[52] The Flux in Australia and the Net Party in Argentina have used liquid democracy principles in their political platforms. Members can delegate their votes to more knowledgeable representatives to ensure informed decision-making.[53]

A multi-signature (multi-sig) voting system requires signatures from participants, embracing accountability by distributing decision-making power among them as a trusted group and avoiding unilateral decisions.[54] This model supports collaboration, discourages single domination, and improves security and accountability. However, this voting system can cause operational delays. Obtaining signatures is time-consuming as the signatories might be located in different time zones. Barriers to technically less educated members and disagreement among some signatories can lead to gridlock, preventing timely decision-making and transaction execution.[55]

The holographic consensus system integrates prediction markets and conventional voting mechanisms. Members propose ideas and then all members discuss and understand the proposal from all perspectives. They then vote on the proposal, and if the majority agrees, it is accepted automatically through smart contracts. Participants wager tokens on the proposal's success or failure and the system incentivizes correct predictions to improve decision-making.[56]

The DAOstack platform uses holographic consensus for decision-making. Community participants submit proposals, staked with tokens to signal their importance. The DAOstack system uses prediction markets to understand the possibility of a proposal's success, permitting only the most popular proposal to be voted on by the entire community. This approach guarantees the decision-making process is efficient and scalable even in substantial, decentralized organizations.[57]

In the conviction voting system, participants constantly give voting power by staking tokens to support specific proposals over time, and the proposals with sustained support are approved.[58] This model supports long-term thinking and commitment to the proposals, improving accountability and thoughtful governance. The system, however, has some drawbacks. Strategic voting can weaken fairness, and there are equity concerns, as technically advanced participants may benefit. Scalability issues and maintaining transparency and trust also pose significant challenges. Notwithstanding these issues, conviction voting provides a distinctive method of decision-making that could improve democratic processes.[59]

In the reputation-based voting system, members earn reputation points based on their active contributions to the DAO, such as completing tasks and participating in governance and community activities, rather than their token holdings, which enable them to contribute positively.[60] Thus, it would contribute to a healthier governance environment. The points are recorded dynamically using smart contracts that automatically update scores based on contributions, ensuring that voting power exhibits present engagement and expertise rather than historical or financial status.[61]

Adopting these alternative voting models for DAOs in the UK could have technological, regulatory, and economic effects. The UK could attract investment in the blockchain and fintech sectors and support its growth to become a global leader in decentralized finance. This will lead to

[52] ibid.
[53] Paul Gölz and others, 'The Fluid Mechanics of Liquid Democracy' (2021) 9 ACM Transactions on Economics and Computation art 23 <https://dl.acm.org/doi/10.1145/3485012> accessed 11 October 2024.
[54] Lipsa Das, How to Make Proposals and Vote in a DAO, <https://unchainedcrypto.com/how-to-make-proposals-and-vote-in-a-dao/> accessed 1 August 2024.
[55] Griffin McShane, 'What Is a Multisig Wallet?' (CoinDesk, 14 December 2022) <https://www.coindesk.com/learn/what-is-a-multisig-wallet/> accessed 11 October 2024
[56] Das (n 54).
[57] Youssef El Faqir, Javier Arroyo and Samer Hassan, 'A Scalable Voting System: Validation of Holographic Consensus in DAOstack' (2021) Proceedings of the 54th Hawaii International Conference on System Sciences <https://hdl.handle.net/10125/71296> accessed 11 October 2024.
[58] Das (n 54).
[59] Youssef El Faqir, Javier Arroyo and Samer Hassan, 'A Scalable Voting System: Validation of Holographic Consensus in DAOstack' (2021) Proceedings of the 54th Hawaii International Conference on System Sciences <https://hdl.handle.net/10125/71296> accessed 11 October 2024.
[60] Rahul, 'Different Models of DAO Membership' (2023) <https://blog.accubits.com/different-models-of-dao-membership/> accessed 1 August 2024.
[61] Colony, 'What is Reputation-Based Voting in DAOs' (Colony Blog, 2023) <https://blog.colony.io/what-is-reputation-based-governance/> accessed 11 October 2024.

the development of blockchain technology and regulatory frameworks, enhancing security, transparency, and governance.

Implementing alternative voting systems presents some challenges. They need legal definitions and guidance to comply with UK corporate governance laws and regulations. Quadratic voting would require regulation to prevent manipulation; liquid democracy would require regulation to facilitate delegated voting rights, and multi-signature requires regulation for coordination challenges and operational delays. Holographic consensus, DAOstack, conviction voting, and reputation-based voting would require new regulations specific to their characteristics. For all the voting systems, the UK could develop a hybrid regulation based on UK corporate governance principles and blockchain-based regulation incorporating decentralized values.

2. Part 2: Adapting existing legal structures to accommodate DAOs

Potential modifications to LLP Law

Redefining legal personhood

The law concerning limited companies and LLPs must be modified to accommodate DAOs, which function without a centralized authority, complicating the conventional notion of legal personhood.[62] Unlike companies and LLPs, DAOs are not bound by a particular state or physical location. A framework that acknowledges DAOs as legal entities should be established, akin to companies or LLPs, by addressing the issue of how they can be modified to suit the distinct nature and requirements of DAOs.[63] One possible approach to including them in the UK legal structure would be to establish a distinct legal entity category exclusively for DAOs based on the structure of an LLP.[64] DAOs would have to have specific legal attributes to be accepted as legal organizations, such as the ability to enter into contracts, own property, and sue and be sued. These attributes offer the essential legal status to operate within the UK legal system. It ensures that they can get involved in commercial activities, protect their assets, and be held responsible for their actions.

LLPs are recognized for their flexibility in management and structure which makes them more adaptable to the decentralized nature of blockchain technologies. In contrast, companies have more rigid structures and regulatory requirements. The emphasis on LLPs permits a tailored approach to the dynamic and automated nature of DAOs and offers a supportive legal framework for new technologies. Conversely, limited companies have comprehensive frameworks for traditional business operations. They are not better suited to the blockchain-decentralized operations of DAOs, making LLPs the logical choice for the new legislation and creating a new legal entity in UK law.[65] Creating a distinct legal organization category for DAO would have profound practical implications. It would mean increased competition from the DAO structure, which provides more transparency and efficiency. The existing legal framework would need to change to accommodate the distinct attributes of DAOs. This change would also accelerate technological innovations in legal and financial services, so businesses and regulators will develop new tools to manage and oversee DAO activities.

Wyoming, Vermont, and Malta have already made modifications by altering the character and nature of LLCs to accommodate DAOs.[66] Wyoming has enacted a statute specifically for a

[62] Law Commission (2024). Decentralised Autonomous Organisations (DAOs). This scoping paper reflects how DAOs can be categorized and identifies current issues around DAOs to inform future law reform or innovations. See Joseph Lee and Rougang Li, 'Law and Regulation for Decentralised Autonomous Organisations (DAOs)' (2023) SSRN 5-7. <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4455052> accessed 20 July 2024. This paper examines the various legal structures that might be used for DAOs and evaluates their suitability and constraints. See GC Charlton, M Adams and C Whang, 'The Decentralised Autonomous Organization: Legal Personality and the Problem of Governance' (2023) 42 Journal of Law & Commerce, <https://jlc.law.pitt.edu/ojs/jlc/article/view/269> accessed 20 July 2024.

[63] Eckhardt and de Jong (n 17) 10–15. See Gail Weinstein, Steven Lofchie and Jason Schwartz, 'A Primer on DAOs' (17 September 2022) Harvard Law School Forum on Corporate Governance <https://corpgov.law.harvard.edu/2022/09/17/a-primer-on-daos/> accessed 20 July 2024.

[64] See Part 2 (5).

[65] See Part 2 (5).

[66] These two jurisdictions are discussed in Part 2. See A Reyes, 'Wyoming and Vermont have Already Made Modifications by Altering the Character and Nature of Legal Entities' (2021) 21 Journal of Corporate Law Studies 145.

Decentralized Autonomous Organization Limited Liability Company (DAOLLC),[67] and Vermont has introduced a Blockchain-Based Limited Liability Company (BBLLC) based on blockchain technology.[68] Wyoming and Vermont introduced legislative changes to LLC structures and created distinctive entities of DAOLLC and BBLLC to accommodate the particular needs and characteristics of blockchain and decentralized technologies, and Malta has introduced a legal framework for DAOs under the Innovative Technology Arrangements and Services Act (ITAS). This facilitates certification of DAOs by the Maltese regulator, the Digital Innovation Authority (MDIA), enabling DAOs to gain recognized legal status.[69] The new legislation offers legal frameworks for DAOLLCs and BBLLCs to operate within US law while using blockchain technology for governance, operations, and DAOs in Malta.

Regulatory and legal treatment of DAOLLPs

The UK legal framework would require new legislation to accommodate DAOLLPs, rather than amending the LLP Act 2000. As the LLP Act offers an adaptable structure suitable for decentralized governance, it was not constructed to serve blockchain-based operations, smart contracts, or token-based voting systems. A tailored DAO-specific legislative instrument—a DAOLLP Act—would be required to define the legal status, governance mechanisms, and regulatory obligations of DAOLLPs.

The new legislation should establish the legal personhood of DAOLLPs, allowing them the authority to enter into contracts, own property, and be subject to legal proceedings. The legislation should also articulate the liability protections afforded to members, empowering them to participate in a DAOLLP, which does not leave vulnerable individuals open to personal liability, as is now the situation with unincorporated associations or general partnerships under UK law.[70]

If DAOLLPs engage in activities involving token issuance, asset management, or financial services, they would probably fall under the scope of the FCA.[71] If DAOLLP tokens are deemed 'specified investments', the Financial Services and Markets Act 2000 (FSMA) and related instruments such as the Regulated Activities Order 2001 would apply.[72] Accordingly, DAOLLPs must be constructed with compliance mechanisms that incorporate anti-money laundering (AML)/know-your-customer (KYC) protocols, investor protection standards, and transparent governance.

The DAOLLP model offers a hybrid legal structure that reflects the operational realities of decentralized organizations while aligning with UK corporate and financial regulation, instead refiguring DAOs into existing company or partnership law. This method establishes legal clarity, regulatory oversight, and market legitimacy—essential for fostering innovation and trust in the digital economy.

Governance structures

The governance structures of limited companies in the UK are determined mainly by the Companies Act 2006.[73] The board of directors, which comprises executive and non-executive directors, is central to this structure. Directors are responsible for steering the company to its strategic objectives while guaranteeing compliance with legal and ethical standards. They are obliged by their fiduciary duties to act in the company's best interest,[74] exercise reasonable care, skill, and diligence, and avoid conflicts of interest.[75] As company owners, shareholders play their part in governance through their voting rights in appointing the directors and endorsing critical

[67] Wyoming Senate Bill 38 Opens in a new window (Wy. Stat. § 17-31-101-115); Wyoming Legislature, 'SF0038 - Decentralized Autonomous Organizations' (2021), <https://wyoleg.gov/Legislation/2021/SF0038> accessed 6 September 2024.

[68] 11 V.S.A. s 4173. See Xiaomeng Zhou, 'DAOs vs. Nation States: A Wyoming DAO's Experiment with the U.S. Securities and Exchange Commission' (SSRN, 2 March 2024) 12 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4746108> accessed 15 July 2024. This article analyses the establishment of American CryptoFed DAO LLC under Wyoming's DAO law. See Stefanie Boss, 'DAOs: Legal and Empirical Review' (2023) SSRN 15 DAOs SSRN <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4503234> accessed 15 July 2024. This article includes a discussion of Vermont's DAO-specific legislation.

[69] See Part 2 (4).

[70] See *Partnership Act 1890*, s 5; *Limited Liability Partnerships Act 2000*, s 1(2).

[71] Financial Conduct Authority, *Guidance on Cryptoassets*, FG19/5 (July 2019).

[72] See *Financial Services and Markets Act 2000*, s 22; *Financial Services and Markets Act 2000 (Regulated Activities) Order 2001*, SI 2001/544.

[73] Also to a lesser extent by the UK Corporate Code.

[74] David Kershaw, 'Corporate Law's Fiduciary Personas' (2020) 136 Law Quarterly Review 454.

[75] Andrew Keay, 'Directors' Duties', in *Company Law* (6th edn, Routledge 2020) 155.

corporate actions.[76] The Articles of Association function as the company's constitution, defining the governance framework and distributing powers between the board and the shareholders.[77] For example, a limited company operates with a hierarchical governance structure in which the board of directors makes strategic decisions and the shareholders vote on the main issues.

LLPs are administered by the Limited Liability Partnerships Act 2000, which provides a flexible but vigorous framework for their operations. They are distinguished by their hybrid nature, as they combine components of both partnerships and limited companies.[78] Primarily, the governance of an LLP is managed by its members, who may be individuals or corporate bodies, and they enjoy limited liability protection. An LLP must have at least two designated members who bear additional statutory responsibilities, such as filing annual accounts and returns with Companies House.[79] The internal governance of an LLP is defined in an LLP agreement, a private document specifying management structure and other operational details. Although not mandatory, it is important for internal governance. An LLP is a distinctive legal entity that can enter into contracts, own property, and be sued in its own name; it has a separate legal personality, separating the entity and its members. This flexible structure and the tax treatment of LLPs as partnerships make them appealing to professional service firms and other collaborative ventures.

LLPs are considered tax-transparent entities, meaning that the LLP itself is not subject to corporate tax. Instead, the tax liability is transferred to the individual members who pay tax on their share of the LLP's profit as personal income. This structure permits tax efficiencies compared to company structures, as profits are not taxed at the entity level before distribution. The transparent character of LLPs offers flexibility in profit distribution, making them an appealing model for businesses pursuing a balance between limited company and tax efficiency.[80]

DAOs represent a unique governance structure that diverges substantially from the corporate and partnership models. Unlike companies and LLPs, DAOs operate without central leadership and rely instead on a decentralized, community-driven method aided by blockchain technology and smart contracts.[81] Governance within a DAO is exercised through tokens that grant voting rights to their holders. These tokens are used to propose and vote on decisions, guaranteeing that control is distributed among the community members rather than focused on hierarchical management structures.

In a DAO, the people responsible for governance are chosen democratically through a decentralized and transparent process on the blockchain. Token membership holders use voting rights to identify, recommend, and elect people to specific roles. The criteria for roles and the voting process are managed through encoded smart contracts. The process uses collective intelligence and various perspectives.

DAOs require a proper governing structure that adapts corporate principles to their decentralized nature. This requires consideration of DAO aspects such as voting mechanisms where each token represents a vote, decentralized decision-making processes using consensus algorithms, and on-chain governance.[82] Accountability in a decentralized environment must be ensured through transparent smart contract execution and audit trails.[83]

DAOs must have a physical address and a point of contact for serving legal and administrative processes by regulatory bodies and other stakeholders for compliance with statutory requirements. It will act as the depository of DAO official documents where its information can be assessed. The physical address will address issues of jurisdiction and enforcement of legal

[76] Paul L Davies, Sarah Worthington and Christopher Hare, *Gower and Davies' Principles of Modern Company Law* (11th edn, Sweet & Maxwell 2021) 233.
[77] ibid 289.
[78] ibid 415.
[79] ibid 423.
[80] Richard Hay, 'Tax Data Transparency: UK', *Trusts & Trustees* (Oxford Academic 2017) 23 139-142.h
[81] Paech, Philipp. 'The Governance of Blockchain Financial Networks' (2017) 80(6) Modern Law Review 1073–1110.
[82] Nils Augustin Andreas Eckhardt and Alexander Willem de Jong, 'Understanding Decentralised Autonomous Organizations from the Inside' (2023) Electronic Markets 12.
[83] SN Khan and others, 'Blockchain Smart Contracts: Applications, Challenges and Future Trends' (2021) 14 Peer-to-Peer Networking and Applications 2901, 2910. This study discusses establishing accountability in a decentralized setting using the transparent execution of smart contracts.

actions. Thus, the physical address will remove the uncertainties of the decentralized nature of DAOs and improve the legitimacy and functionality of DAOs in the UK legal system.[84]

Incorporating DAOs into UK law requires a well-defined separate legislative framework which leverages blockchain technology and smart contracts to enable decentralized decision-making, providing legal clarity for token distribution that avoids token concentration and ensures compliance with financial regulation and legal recognition of smart contracts. Such a distinctive regulation will enhance the legitimacy and functionality of DAOs and a forward-thinking method of governance in the digital age. A DAO-specific Act would address all the relevant issues, such as legal status, liability, compliance, promoting trust, and adoption. Such a legislative framework would modernize the legal and financial system, make the UK a global leader in DAO innovation, attract talent and investment in decentralized finance, and accelerate technological advancement and economic growth.

The role of smart contracts in integrating and adapting existing law and regulation

Contract theory, which justifies the principles of agreement formation, execution, and enforceability, is foundational in understanding smart contracts' role in DAOs. Smart contracts are self-executing agreements whose terms are pre-written into code. They foster an alternative approach to contract law by automating the formation, execution, and enforcement of contractual terms. Smart contracts follow the principles of contract law, albeit reducing the role of an intermediary and enhancing trust with transparency. Nevertheless, smart contracts are controversial due to a lack of clarity on how errors, misrepresentations, and disputes will be addressed. However, the contractual theory can deal with these issues under the same principles of contract law that apply to traditional contracts.

DAOs must comply with laws and regulations, and how these laws and regulations apply to them needs to be clarified.[85] Once DAOs are determined to be legal organizations, laws and regulations will apply automatically through smart contracts, which can be encoded to implement AML/KYC regulations.[86] DAOs can verify members' identities and transactions to prevent financial crime. They can use decentralized identity (DID) systems to enable identification solutions, which allow individuals to control their identity data.[87] DID systems can be integrated into DAOs and combined with blockchain technology to authenticate identities without consolidating data. DAOs can condition that the members verify before performing a transaction or vote.[88]

Consumer protection laws can also be encoded in smart contracts. For example, consumer rights, consumer compliance with the Consumer Rights Act 2014, employment laws, and compliance with the Employment Rights Act and Equality Act 2010 can be encoded in smart contracts. Hence, DAOs can integrate with the legal framework, providing a compliance structure for decentralized governance and operations. Platforms such as Aave and Compound have embedded smart contracts for structuring AML/KYC compliance.

By harnessing the potential of smart contracts, DAOs can effortlessly integrate with all existing legal frameworks. This provides a compliant structure for decentralized governance and operations, enhancing legal compliance and fostering participant trust and transparency.

Addressing cross-border legal issues

DAOs operate on blockchain and transcend geographical boundaries. This section discusses DAO jurisdictional challenges, international regulatory cooperation, conflicts of laws, and dispute resolution.

[84] Wright and De Filippi(n 43) 231.
[85] Law Commission, Decentralised Autonomous Organisations: A Scoping Paper (2023) 29.
[86] D Post and J Wong, 'The Right Legal Wrapper Can Protect a DAO and Its Members' (2023) US Law Week 3 <https://news.bloomberglaw.com/us-law-week/the-right-legal-wrapper-can-protect-a-dao-and-its-members> accessed 21 July 2024. This study discusses the compliance challenges DAOs face, including AML and KYC regulations and suggests legal structures to mitigate these issues. Money Laundering, Terrorist Financing and Transfer of Funds Regulation 2017, FCA (2017) 45.
[87] Microsoft's ION, operates on the Bitcoin Blockchain and uPort.
[88] Eckhardt and de Jong (n 17) 15–17.

Jurisdictional challenges

Defining and resolving jurisdictional issues for DAOs is a challenge as they operate across multiple jurisdictions or globally. Their membership is multijurisdictional and is served by servers globally.[89] However, there are some proposed solutions for jurisdictional disputes: (i) embracing a lead jurisdiction model, designated as a primary jurisdiction model; (ii) international arbitration using arbitration bodies specializing in blockchain and based on factors like the location of the majority of members on the primary server or physical address in a primary physical jurisdiction; and (iii) smart contract clauses which embed jurisdictional clauses within smart contracts to pre-determine the applicable law and forum for disputes.[90]

International regulatory cooperation

The potential challenge is the absence of a global regulatory framework, which can lead to regulatory arbitrage. DAOs will seek favourable jurisdictions, and so there is a need for international cooperation and harmonization of regulations globally.[91]

There are some proposed solutions to achieve international regulatory cooperation and harmonization. First, there is the creation of a global regulatory sandbox and a sandbox environment where DAOs can operate under a harmonized set of regulations for a trial period. The FCA and the Singapore Monetary Authority sandboxes have promoted innovation, ensured regulatory oversight, and have effectively allowed fintech startups to test their products in a controlled environment. The valuable insights and feedback provided by these experiences can be adapted to the global DAO ecosystem. Second, establish an international DAO regulatory body to create and enforce harmonized regulations for DAOs, including bilateral and multilateral agreements where countries can recognize and enforce each other's DAO regulations.[92] A possible structure for such a body could consist of representatives from various states to create and implement harmonized regulations.[93] Such a body would oversee compliance, facilitate cross-border cooperation, and resolve mandate disputes. International bodies such as the Financial Action Taskforce (FATF)[94] and the International Organization of Securities Commissions (IOSCO)[95] have effective frameworks for international regulatory cooperation which could be adapted for DAOs.

Maker DAO is a case in point. It is a DeFi platform that has faced regulatory scrutiny in various jurisdictions. It takes a structured approach to addressing compliance with varying financial regulators,[96] which consists of a combination of jurisdictional strategies, international cooperation, and dispute resolution mechanisms that can create a robust regulatory framework that accommodates DAO characteristics.[97] Aragon DAO navigates cross-border legal issues through its decentralized governance structure and legal wrappers.[98]

[89] Florence Guillaume, 'Decentralized Autonomous Organizations (DAOs) Before State Courts. How Can Private International Law Keep Up With Global Digital Entities?' in Madalena Perestrelo de Oliveira and Antonio Garcia (eds), *DAO Regulation: Principles and Perspectives for the Future* (2023) 12–14.

[90] Peter Aeberli, 'Jurisdictional Disputes under the Arbitration Act 1996: A Procedural Route Map' (2005) 21Arbitration International 253. This article provides a comprehensive overview of jurisdictional disputes and arbitration, which can help discuss adopting a lead jurisdiction model and international arbitration for DAOs.

[91] Bernard Hoekman, 'International Regulatory Cooperation and Trade Agreements' in Bernard Hoekman (ed), *The Oxford Handbook of Institutions of International Economic Governance and Market Regulation* (OUP 2019) 14–15. This section analyses the significance of international regulatory cooperation in managing the interface between market access objectives and national regulatory preferences. This aligns with the need for harmonized regulations for DAOs to prevent regulatory arbitrage.

[92] J Zapata Sevilla, 'Analysing decentralised autonomous organisations (DAOs): limits and perspective' (2024) 33 Journal of Banking Regulation 45. This article examines various regulatory approaches, including establishing a global regulatory sandbox, forming an international DAO regulatory body and using bilateral and multilateral agreements.

[93] Ibid.

[94] <https://www.fatf-gafi.org/> accessed 22 August 2024

[95] <https://www.iosco.org/> accessed 22 August 2024

[96] David Carlisle, 'Crypto 2023 predictions: DAOs will face intensifying regulatory scrutiny and enforcement' (Elliptic, 26 December 2022) 3–53. <https://www.elliptic.co/blog/analysis/crypto-2023-predictions-daos-will-face-intensifying-regulatory-scrutiny-and-enforcement>.

[97] Biyan Mienert, 'Managing Cross-Border DeFi DAOs in the EU: Legal Complexities and Regulatory Perspectives' (SSRN, 30 April 2024), 1–18 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4852000>

[98] Chris Brummer and Rodrigo Seira, 'Legal Wrappers and DAOs' (30 May 2022) SSRN <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4123737> accessed 23 July 2024, 15–182.

Conflict of laws

Applying conflict of laws to DAOs is difficult in issues such as contract enforcement and dispute resolution. However, these issues can be resolved through the operations of smart contracts, which often operate under the legal framework of the jurisdiction where the blockchain is most operational. The solution lies in determining the governing law within the smart contract and using a decentralized dispute resolution mechanism.[99] OpenLaw and Lexon exemplify this approach by including legal provisions in smart contracts for enforceability across jurisdictions.

DAOs dealing with intellectual property must explore varying national laws. The proposed solution uses internationally recognized blockchain-based IP registers such as the one used by the European Union Intellectual Property Office. Blockchain-based registers, such as IBM's Intellectual Property Management Platform and IPwe, demonstrate successful protection and management of intellectual property using blockchain technology. These platforms ensure that the rights are correctly recorded and easily verifiable, enhancing transparency and security. In *Commodities Futures Trading Commission (CFTC) v Ooki DAO*,[100] the Court analysed whether a DAO could be identified as a legal entity and be subject to legal proceedings. It held that the DAO could be treated as an 'unincorporated association' under California state law, which facilitated the CFTC to serve process on the DAO itself. The case displays challenges of legal interpretation and applying traditional legal frameworks to DAOs, particularly in issues of jurisdiction and enforcement.[101]

Dispute resolution

The distinctive challenge is that the courts lack the expertise to adjudicate DAO-related disputes in the existing legal system. However, this challenge can be overcome by developing specialized blockchain arbitration panels.[102] Kleros, a decentralized arbitration service, exemplifies this solution by offering an on-chain dispute resolution system that uses smart contracts to facilitate efficient, knowledgeable, and transparent dispute resolutions.

Jurors are crowdsourced and chosen at random from the membership of token holders. They are commercially incentivized. The voting for the selection process of jurors is through smart contracts that make it fair, impartial, and diverse. It is conducive to attracting knowledgeable members who review the evidence and make decisions enforced by smart contracts.[103] This dispute resolution model can advance the blockchain ecosystem.[104] It has resolved various disputes, such as crypto token certifications, escrow disagreements, and content moderation.

Case studies: Wyoming and Vermont's approach to DAOs

Wyoming

Wyoming has introduced a new statute for DAOLLC.[105] This groundbreaking alternative to business structures incorporates blockchain technology and smart contracts and operates through a decentralized system. It changes how corporations can be managed and governed. DAOLLC operates on the blockchain, which ensures transparency and immutability of records. Smart contracts automate operations and decision-making. The integration of decentralized technology and smart contracts reduces third-party intervention and improves the effectiveness of corporate transactions.[106]

[99] Aaron Wright and Primavera de Filippi, 'Decentralised Autonomous Organisations: Governance, Dispute Resolution and Legal Challenges' (2021) 2 Stanford Journal of Blockchain Law & Policy 45. This article analyses the issues of contract enforcement, intellectual property rights and dispute resolution in DAOs. It suggests solutions such as specifying governing law within smart contracts and using decentralized dispute resolution mechanisms.

[100] *CFTC v Ooki DAO*, 2022 WL 17822445 (N.D. Cal. Dec 20, 2022).

[101] Ibid.

[102] Magdalena Łągiewska, 'New Technologies in International Arbitration: A Game-Changer in Dispute Resolution?' (2023) 37 International Journal for the Semiotics of Law 851, 864. The article discusses the role of arbitration in dispute resolution, which can be adapted to the needs of DAOs in dispute resolution.

[103] Luis Bergolla, Karen Seif and Can Eken, 'Kleros: A Socio-Legal Case Study of Decentralized Justice & Blockchain Arbitration' (2022) 37 Ohio State Journal on Dispute Resolution 55.

[104] World Economic Forum, 'Bridging the Governance Gap: Dispute Resolution for Blockchain-Based Transactions' (White Paper, December 2020) 3.

[105] Wyoming Decentralized Unincorporated Nonprofit Association Act (DUNA Act), W.S. 17-32-101 through 17-32-129. The Act can be found in the Wyoming Statutes under Chapter 32: <https://wyoleg.gov/2024/Enroll/SF0050.pdf> accessed 16 January 2025

[106] Ibid.

Under Wyoming's statute, membership and voting rights have also been transformed under the DAOLLC framework. DAOLLC can manage membership interests and vote through digital assets and smart contracts. It facilitates automated, transparent, interference-resistant voting processes, guaranteeing that members have an equal say in the DAO's decisions.[107]

DAOLLC provides legal recognition and liability protection. Like LLCs, DAOLLC structures offer protection from personal liability for corporate debts and ensure that they are not treated as general partnerships. DAOLLC members have absolute legal standing and protection.[108]

Wyoming legislation requires DAOLLCs to have a physical address within the state for the service of official correspondence, legal notices, and a point of contact for regulatory entities and administrative purposes. This underscores the accessibility of DAOLLCs by all stakeholders, which is also conducive to enhanced transparency and accountability of DAOLLCs.[109]

Wyoming's new legislation mandates the appointment of a registered agent who must have a physical address in Wyoming and is responsible for receiving legal papers for the DAOLLC. This agent is the official point of contact for legal and administrative correspondence. This requirement, specifically tied to the operational structure of DAOLLCS, offers legal clarity and protection.[110]

The quorum and decision-making procedures in DAOLLCs have also improved because of automation. DAOLLCs can automate requirements for quorum and decision-making via smart contracts, streamlining governance and ensuring efficiency and transparency in the processes, reducing the potential for misunderstandings and disputes.[111]

DAOLLCs can issue and manage digital assets (tokens) that are membership interests or value for the DAOs. This capability is conducive to fundraising, incentivizing participation, and distributing profits. This capability makes DAOLLCs innovative and flexible corporate structures for the digital future.[112]

Vermont

Vermont's legislation for BBLLCs[113] introduced significant changes to the law when compared to LLCs by distinguishing the unique needs of businesses that use blockchain technology. BBLLCs are acknowledged as organizations that mainly incorporate blockchain for their operations. This specific legal recognition differentiates them from LLCs, which do not use blockchain.[114] The purpose of the legislation is to provide a supportive framework for BBLLCs.

The key feature of the new legislation is that it provides legal status to BBLLCs and offers limited liability protection for its members, similar to LLCs. The members are not personally liable for the BBLLC's debt or liabilities.[115] It requires that BBLLCs maintain a physical address in Vermont and assign a registered agent for service of process to ensure that the BBLLC has a tangible presence in the state.[116] This requirement aligns with the regulation of LLCs.

BBLLCs' management and governance are performed through blockchain technology, which uses smart contracts for voting procedures, software upgrades, and security breaches.[117] The decentralized character of blockchain allows for efficiency and transparency in BBLLC management processes.

The new legislation requires that the operating agreement for a BBLLC contain information regarding the company's purpose, the decentralization of the blockchain ledger, voting processes, protocols for security breaches, and the rights and obligations of participants.[118] All aspects of BBLLC's operations are precisely defined and transparent.

[107] Wyoming Legislature, 'SF0038 - Decentralized Autonomous Organizations' (2021) Section 17-31-111, Article 1.
[108] Wyoming Legislature, 'SF0038 - Decentralized Autonomous Organizations' (2021) Section 17-31-103.
[109] Wyoming Legislature, 'SF0038 - Decentralized Autonomous Organizations' (2021) Section 17-31-105, Article 1.
[110] Wyoming Legislature, 'SF0038 - Decentralized Autonomous Organizations' (2021) Section 17-31-105, Article 1.
[111] Wyoming Legislature, 'SF0038 - Decentralized Autonomous Organizations' (2021) Section 17-31-111, Article 1.
[112] Wyoming Legislature, 'SF0038 - Decentralized Autonomous Organizations' (2021) Section 17-31-102.
[113] Vermont Legislature, 'No. 205. An act relating to blockchain business development' (2018) available at: <https://legislature.vermont.gov/Documents/2018/Docs/ACTS/ACT205/ACT205%20As%20Enacted.pdf> accessed 23 July 2024).
[114] Vermont Legislature, 'No. 205. An act relating to blockchain business development' (2018) Section 1(9).
[115] Vermont Legislature, 'No. 205. An act relating to blockchain business development' (2018) Section 7.
[116] Vermont Legislature, 'No. 205. An act relating to blockchain business development' (2018) Section 2.
[117] Vermont Legislature, 'No. 205. An act relating to blockchain business development' (2018) Section 7.
[118] Vermont Legislature, 'No. 205. An act relating to blockchain business development' (2018) Section 7.

Vermont's BBLLC legislation offers a legal framework that supports unique blockchain-based business needs by integrating blockchain technology into governance and management. BBLLCs operate transparently and efficiently. The legislation ensures that BBLLCs have a physical presence in Vermont and continue to provide limited liability protection to their members.

Malta

Malta has determined a comprehensive legal framework for DAOs under the ITAS.[119] ITAS facilitates certification[120] of DAOs by the MDIA,[121] enabling DAOs to gain recognized legal status and providing a framework for these entities to operate legitimately within the legal system.[122] MDIA can certify DAOs for specified purposes based on certain qualities, features, attributes, behaviours, or aspects it specifies.[123] The MDIA keeps a register of all DAOs available on its website, which allows the public to identify the DAOs and their activities.

ITAS requires DAOs to have a physical address or resident agent in Malta.[124] The agent is a point of contact for correspondence with stakeholders, particularly MDIA.[125] This requirement is similar to that found in Wyoming and Vermont. The important feature of this legislation is that it identifies a DAO's jurisdiction.

Malta is an EU Member State and thus, other member states are obliged to recognize Maltese-registered DAOs as legal entities. This would allow Maltese-registered DAOs to engage in business, contract, sue or be sued, and buy property across the EU Member States as registered legal persons with separate personalities.[126] However, how other EU Member states will react to Malta's plan is uncertain. The harmonization across EU jurisdictions is a complex issue.

Wyoming, Vermont, and Malta's case studies demonstrate the successful accommodation of DAOs as alternative legal structures in their legal systems. They address the innovative challenges of decentralization, blockchain technology, and smart contracts. Wyoming's DAOLLC and Vermont's BBLLC legislation model provide legal recognition to the DAOs and liability protections to their members. Similarly, Malta's ITAS provides a regulatory framework that legitimizes DAOs and facilitates their operation within the broader EU context.

This approach underscores the potential for the UK to foster a specific DAO model. The UK can create a legal framework by merging decentralization principles with strong legal protections that ensure transparency, compliance, and accountability, developing trust and innovation within the digital economy.

Positioning the DAOLLP model relative to the UK Law Commission's work

The UK Law Commission published the scoping paper on DAOs in 2023, accepting the new legal challenges posed by them, notably concerning legal personhood, liability, enforceability, and jurisdictional uncertainty.[127] The Commission did not recommend specific legislative reforms, citing the complexity and evolving nature of the technology. At the same time, it acknowledged the growing relevance of DAOs in the digital economy.[128] Rather, it recommended that many DAOs could be treated as general partnerships or unincorporated associations, which renders participants vulnerable to personal liability and introduces uncertainty in contract enforcement and regulatory compliance.

This prudent course of action allows a regulatory vacuum that risks inhibiting innovation and compromising legal certainty. The DAOLLP model proposed in this article directly addresses the legal gaps identified by the Law Commission. The DAOLLP structure offers a clear framework for liability, legal personhood, and regulatory compliance by providing a novel legal entity that combines the flexibility of LLPs with the decentralized governance of DAOs. It advances beyond

[119] <https://legislation.mt/eli/sl/591.1/eng>
[120] Innovative Technology Arrangements and Services Act (ITAS) (Malta 2018), Section 5.
[121] <https://www.mdia.gov.mt/>
[122] Internet Native Organization (INO), 'Global DAO Jurisdictions: Malta' (INO, 10 November 2023) shows 4.
[123] Innovative Technology Arrangements and Services Act (ITAS) (Malta 2018) Section 5.
[124] Innovative Technology Arrangements and Services Act (ITAS) (Malta 2018) Section 12 (2).
[125] Innovative Technology Arrangements and Services Act (ITAS) (Malta 2018) Section 13 (c).
[126] Innovative Technology Arrangements and Services Act (ITAS) (Malta 2018) Section 6 (1).
[127] UK Law Commission, *Decentralised Autonomous Organisations: Scoping Paper*, Law Com No 409 (2023), paras 1.1–1.4.
[128] Ibid, paras 5.1–5.3.

the limitations of existing partnership law and unincorporated association status, providing limited liability protection and a defined legal identity for DAOs operating in the UK.

The DAOLLP model also reflects the Law Commission's focus on policy coherence and adaptability.[129] It offers a tailored legislative solution that can evolve with technological advancements by integrating core principles of UK corporate law and financial regulation. Thus, it provides a pragmatic and forward-looking alternative to the Commission's reserved approach, a framework that fosters innovation while safeguarding legal integrity.

Proposed Model for the UK: DAOLLP

DAOs usually bring together a group of people who share a common goal: making a profit, supporting a cause, or managing resources. Governance, that is, decision-making, is often distributed among members rather than being centralized in one authority. It is akin to the flexible LLP model, where partners make decisions by agreement; a display of governance is not centralized.[130]

This study proposes founding a new legal organization modelled on the LLP concept as the DAOLLP to effectively regulate DAOs. This conceptualization integrates decentralization principles with the legal protection of LLPs and offers a framework for the effective governance of DAOs within the UK legal system. This proposed DAOLLP model draws on the principles of corporate law and DAOs. It also draws on the doctrinal foundations of legal personhood and decentralized governance. Legal personhood gives DAOLLPs the capacity to enter into contracts, own property, sue and be sued, hence providing a legal status. Thus, DAOLLP will have a legal personhood status.[131] It makes DAOLLP accountable and grants it limited liability protection. The inclusion of decentralized governance principles, such as smart contracts and token-based voting, guarantees that the DAOLLP model aligns with the nature of DAOs.

The comparative analysis of English corporate legal structures and international approaches underscores the potential of the DAOLLP model to make the UK a leader in the digital economy. The DAOLLP regulatory framework should incorporate the foundational principles of accountability, flexibility, transparency, inclusivity, and interoperability to make it a comprehensive framework capable of addressing unique challenges posed by decentralized organizations.

This will increase its operational legitimacy, enabling it to be involved in commercial activities and protect the interests of its members through limited liability protections. DAOLLPs with legal status can enter into contracts, own property, and engage in legal proceedings. The legal status will grant them limited liability guarantees that DAOLLP members are not personally liable for the organization's liabilities, meaning that their assets are not at risk. This will align them with the capabilities of LLPs and the security similar to LLPs, which would encourage participation and investment in DAOLLPs.[132]

The DAOLLP should use the token-based voting system and smart contracts to maintain decentralized decision-making. Token holders participate in governance by voting on proposals collectively; smart contracts execute decisions automatically and transparently, mitigating the potential for centralized manipulation.[133] Smart contracts determine the rights and responsibilities of DAOLLPs and play an important role in underpinning the legal foundations of organizations. The encoding of agreements and governance rules in smart contracts guarantees that all transactions and decisions are transparent, automatic, and enforceable. These characteristics increase trust, efficiency, and interoperability.

Accountability processes ensure that DAOLLP developers and members are held accountable for their deeds, especially fraud or misconduct. These processes include establishing clear liability for DAOLLP developers and members and implementing a vigorous resolution procedure, such as arbitration or mediation, to deal with conflicts efficiently and fairly.[134] Such an approach maintains integrity and trust within the DAOLLP model.

[129] Ibid, para 6.2: 'Any future reform should be guided by principles of legal certainty, technological neutrality, and proportionality.'
[130] See above Part 1 (a) and Part 2 (1) (a).
[131] Ibid.
[132] Ibid.
[133] Ibid.
[134] Jason Scharfman, 'Decentralized Autonomous Organization (DAO) Fraud, Hacks and Controversies' in Jason Scharfman (ed), *The Cryptocurrency and Digital Asset Fraud Casebook*, Volume II (Springer 2024) 65–106. This

Flexibility in the regulatory framework is essential to accommodate innovation and the specific requirements of OAOLLPs. The framework must be adaptable, able to continuously evolve with technological advancements, and be updated to face challenges in the field.[135] The important aspect of the DAOLLP model is that it is tax transparent, meaning tax is not paid by the DAOLLP but by its partners on their profit thus the partners can pay their taxes in their countries of residence according to the jurisdiction's prevailing tax laws. The DAOLLP model simplifies tax compliance globally.

Transparency builds trust and facilitates stakeholders' verification of operations. Implementing accountability mechanisms is essential to dealing with fraud or misconduct and effectively developing a reliable and ethical governance structure. Transparency in governance essentially means making smart contracts and decision-making processes accessible. Encoding governance rules in smart contracts will ensure that transactions and decision-making are transparent, leading to increased efficiency and trust. DAOLLP's governance must be transparent, providing public access to smart contracts and decision-making processes. Smart contract processes must be publicly observable and auditable, allowing stakeholders to verify the DAOLLP's regulations and operations.[136]

Inclusivity is an important regulatory framework principle for DAOLLPs. It can be accomplished by promoting and executing inclusive policies and practices that will foster diverse membership in governance and decision-making.[137] Stakeholders are encouraged to participate regardless of their standing and expertise. This creates opportunities for them to contribute and influence decision-making, leading to a more representative and equitable governance model.

Interoperability is crucial for the smooth integration of DAOLLPs with other systems and platforms. It includes establishing protocols that allow different DAOLLPs to interact effectively. Interoperability guarantees that DAOLLPs can operate within an ecosystem, enhancing their functionality and utility.[138]

DAOLLPs based on corporate and DAO principles will create DAO personhood without necessarily sacrificing their decentralized nature, enabling more adaptable governance and operational frameworks. One recommendation is to use regulatory sandboxes to test and improve new legal frameworks for DAOLLPs.[139] This would allow experimentation and adjustment before full-scale implementation to ascertain whether the framework is effective and resilient.

DAOs are vehicles of economic and business growth in the UK in the digital age. Parliament needs to clarify its legal status by legislating to commit the UK to foster emerging technologies such as decentralization, blockchain, and smart contract applications. It needs to develop a new DAO legal entity based on the existing structure of LLP. This new DAOLLP model must be based on DAO and corporate principles.

Capital Markets Law Implications of DAOLLPs

The suggested DAOLLP model, though grounded in decentralized governance and blockchain technology, unavoidably intersects with the regulatory landscape of financial and capital markets. While DAOLLPs may issue tokens or digital assets to facilitate governance, fundraising, or incentivization, these instruments could come within the scope of UK financial services and securities laws, especially under the Financial Services and Markets Act 2000 (FSMA) and the Regulated Activities Order 2001.

chapter discusses various accountability mechanisms and legal liabilities for DAO members and developers, including establishing new legal entities and dispute resolution mechanisms such as arbitration or mediation.

[135] Stefanie Boss, 'DAOs: Legal and Empirical Review' (Amsterdam Law School Research Paper No 2023-27, 2023) 15.SSRN <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4503234> accessed 23 July 2024. The article emphasizes the necessity for flexible and future-proof legislation to accommodate the unique needs of this article makes several significant contributions to the understanding and regulation of Decentralised Autonomous Organisations (DAOs) within the UK legal landscape. DAOs and the rapid pace of technological advancements.

[136] Adam P Balcerzak and others, 'Blockchain Technology and Smart Contracts in Decentralized Governance Systems' (2022) 12 Administrative Sciences 96. <https://doi.org/10.3390/admsci12030096>.

[137] Stefanie Boss and Lauren Fahy, 'Regulator Reputation and Stakeholder Participation: A Case Study of the UK's Regulatory Sandbox for Fintech' (2022) 13 European Journal of Risk Regulation 138.

[138] Aaron (n 13) 12, 12–14.

[139] Stefanie Boss, 'DAOs: Legal and Empirical Review', Amsterdam Law School Research Paper No 2023-27, Institute for Information Law Research Paper No 2023-06, 2023, pp. 15–17. SSRN <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4503234> accessed 21 July 2024.

Token issuance and regulatory classification

Tokens issued by DAOLLPs may serve multiple purposes, such as governance rights, access to services, or profit-sharing mechanisms. Based on their design and purpose, such tokens could be classified as specified investments[140] or security tokens,[141] making them liable to regulation by the FCA. Suppose tokens confer rights akin to shares or debt instruments. In that case, DAOLLPs may be required to comply with prospectus requirements, disclosure obligations, and investor protection rules under the UK Prospectus Regulation and Markets in Financial Instruments Directive II (MiFID II).[142]

Investor protection and market transparency

DAOLLPs are obliged to ensure that token holders who may operate as investors are adequately protected.[143] This encompasses disclosures of token utility, voting rights, risks, and governance mechanisms. Encoding consumer protection principles into smart contracts, such as dispute resolution clauses and refund mechanisms, can improve trust and reduce regulatory risk. DAOLLPs should also adopt transparent reporting standards, potentially by means of on-chain disclosures, to ensure market integrity and prevent information asymmetry.

Regulatory oversight and compliance

DAOLLPs may be required to register with the FCA or seek authorization if they engage in regulated activities such as asset management, exchange services, or token issuance to operate within the UK's capital markets framework.[144] Compliance with AML and KYC regulations is necessary, and can be enabled by smart contract integration and decentralized identity systems.[145] The FCA's evolving position on cryptoassets and decentralized finance (DeFi) indicates that DAOLLPs must actively engage with regulators to ensure legal clarity and operational legitimacy.

3. Conclusion

This article makes several significant contributions to understanding and regulating DAOs in the UK.

1) This article proposes the DAOLLP model for DAOs in the UK. The UK legal system adapts and recognizes DAOLLPs as legal persons based on the concept of LLP. Legal personhood would allow DAOLLPs to enter into contracts, own property, and engage in legal proceedings. This model would legitimize DAOs, promote their participation in economic growth, and develop new business models that operate on the blockchain through smart contracts and support decentralized governance.
2) The DAOLLP model incorporates existing UK legal principles and blockchain principles. It ensures that DAOs comply with regulatory requirements such as AML and KYC regulations. Compliance is vital for building trust and the adoption of DAOs across various sectors. The DAOLLP model addresses the regulatory concerns in mitigating the risks associated with financial crimes.
3) This article emphasizes the significance of transparency and accountability in DAO governance. The proposed model suggests publicly accessible smart contracts and transparent decision-making processes to mitigate risks such as fraud and misconduct. This would give members a voice and enhance their confidence, leading to stakeholders' enhanced participation and trust in DAOLLPs.

[140] Financial Services and Markets Act 2000, s 22 and Sch 2.
[141] FCA, *Guidance on Cryptoassets* (PS19/22, July 2019).
[142] Regulation (EU) 2017/1129 as retained in UK law by the *European Union (Withdrawal) Act 2018* or seek exemptions under the *Financial Promotion Order 2005*, Financial Services and Markets Act 2000 (Financial Promotion) Order 2005, SI 2005/1529.
[143] Financial Services and Markets Act 2000, s 19; Financial Conduct Authority, *Principles for Businesses* (PRIN 2.1.1R), especially Principles 6 and 7.
[144] Ibid.
[145] FCA, *Money Laundering Regulations* (MLR 2017): The Money Laundering, Terrorist Financing and Transfer of Funds (Information on the Payer) Regulations 2017, SI 2017/692.

4) The proposed model and the associated legal and regulatory framework are flexible, allowing continuous adaptation to technological advancements in the blockchain ecosystem so that the legal framework stays relevant and effective in addressing future challenges. Thus, the DAOLLP model positions the UK as a leader in blockchain governance, attracting investment and talent in the fast-emerging digital economy.
5) The study underscores the need for international regulatory cooperation to address DAOs' cross-border character and how jurisdictions collaboratively deal with their complexities, such as avoiding regulatory arbitrage. International rules will facilitate DAO operations across jurisdictions and improve their operational legitimacy.
6) The study promotes ongoing academic debate about the evolving landscape of blockchain technology and its legal implications. It aims to understand how DAOs can be effectively integrated into existing legal systems while preserving their innovative characteristics.

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