Law Commission
Reforming the law

Decentralised autonomous organisations (DAOs)

Summary of scoping paper

This publication is available at: www.gov.uk/official-documents

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Decentralised autonomous organisations (DAOs)

Decentralised autonomous organisations or "DAOs" are a new kind of internet-based collaborative organisation that coordinate people and resources using rules expressed in computer code. They are part of what might be called the "crypto ecosystem".

So-called DAOs control billions of dollars of assets. They have already been the subject of litigation in the US, and potentially expose participants to significant legal liabilities. And yet, beyond the very high-level description above, they are difficult to describe, practically or legally, largely because the term "DAO" does not refer to any one type of arrangement. Commentators disagree over what characteristics an arrangement must have in order to be properly called a "DAO", and many arrangements using the term look very different from the DAO ideology as originally conceived.

The Law Commission was asked by the Government to undertake a scoping study on DAOs, and in particular to:

- explain what a DAO is, and how a DAO might be categorised in law; and
- identify the main options for legal reforms or innovations that might be required to existing company law and other legislation in England and Wales to clarify the status of DAOs and facilitate their uptake.

Our work is addressed primarily to the Government and therefore focuses on the aspects of DAOs that are significant for policy and legal purposes. As such, we do not aim to provide overly detailed or technically precise descriptions of the technical features of DAOs, but rather explain the technological features to the extent necessary in that context. It is designed to be an introduction to the topic, rather than a comprehensive review of everything going on in the market, with all the intricacies of practice. We identify some of the implications of different structures, and identify situations in which stakeholders involved with such arrangements may be exposed to risk, to raise awareness and encourage participants to consider their exposure. We therefore hope that our work will also be of interest to market participants and advisors.

This is a summary of a longer scoping paper available at lawcom.gov.uk/project/decentralised-autonomous-organisations-daos.

A high-level introduction to DAOs

The DAO philosophy

DAOs are, fundamentally, a way of facilitating the coming together of individuals to realise certain shared goals (commercial or otherwise) and, in many cases, to be rewarded for their efforts. Of course, this is not a new concept; people have worked together for centuries, using structures of varying formality to manage their relationships. The limited company rose to prominence more than a century ago. Companies are subject to a comprehensive set of laws and regulations, from directors' duties to reporting requirements.

DAOs seek a different way of facilitating collaboration, and grew out of a desire to operate other than in this highly-regulated, state-controlled environment.

The DAO idea started from the proposition that particular technological developments could be used to make organisations more transparent, democratic and equitable. The idea was that organisations could be community built, owned and operated, without centralised leadership. They would be run by automated software programs, with little or no human involvement. These programs were to run across a distributed network of computers, often using distributed ledger technology (DLT), which we explain in more detail below. The distribution of information and control is key to the concept of "decentralisation" (the "D" in "DAO"): there should be a distribution of power within the organisation such that participants can contribute to the function and decision-making of the DAO, rather than control being vested in a single, central authority such as an executive board.

The concept took inspiration from Bitcoin, where the rules for the operation of a cryptocurrency system are determined by auditable open-source software run on DLT, intended to be largely free of outside influence and centralised authority, including that of governments and banks. This "self-sufficient" existence, free from outside laws or real-world intervention, is a central tenet of the "autonomous" element of the DAO philosophy (the "A" in "DAO").

"Autonomous" can also be used to refer to the perceived self-executing, automated nature of "smart contracts": computer programs that run automatically, in whole or in part, without the need for human intervention. This feeds into the idea held by some DAO proponents that outside laws are unnecessary and inappropriate: "code is law". This element, together with other features of the technology underpinning the idea of a DAO, is said to make the arrangement "trustless". This is the idea that participants do not have to trust each other, or a central authority, because the technology ensures that things are run as intended.

The original idea was that all of the entity's assets, funding and actions would be held or executed online and "on-chain" (that is, on the distributed ledger) to ensure transparency at all times. This would mean that the organisation's assets would almost certainly be cryptoassets, whether issued by the organisation itself or by a third party, with no "real-world" assets or transactions. In contrast to the transparency intended for operational and financial information, participants may be anonymous or pseudonymous, and even the original software developers are not necessarily known to each other. Participants may simply be identified by online identifiers

or addresses, as is the case for Bitcoin. Individual privacy is often seen as a central tenet in the crypto ecosystem.

Features of the "ideal" DAO

DAOs, at least as originally conceived, would be likely to share some or all of the following features and philosophical goals:

- A group of people with common interests or goals – whether commercial or otherwise.
- Use of self-executing computer programs (smart contracts run on DLT) to implement the rules of the organisation and control its activities, rather than human actors.
- Use of open-source software, which a community of software developers use, contribute to and develop.
- The decentralisation of decision-making, often involving the issue of native crypto-tokens that give the holders voting and governance rights.
- Fully online, "on-chain" operations; no real-world assets.
- A treasury in the form of a fund often composed of various crypto-tokens held in smart contracts, used to support the organisation's operations. The treasury is often managed by a "multi-signature" arrangement that requires multiple signatures to make a transaction, to limit opportunities for theft or misuse.
- Transparency at an operational/governance level, including decision-making and asset holding, so that participants and third parties know what is happening at any particular time.
- "Censorship resistance" – technical and social resistance to outside control (including the avoidance of existing legal forms). For some DAOs this could extend as far as an ambition to be entirely free from outside oversight such as national governments and regulators.
- Owners and decision-makers being the same people rather than a separation between, for example, shareholders and directors in a traditional company structure.
- Incentivising and rewarding participants in the community who contribute towards the DAO's creation, development, and/or operation (often by the distribution of governance or other crypto-tokens).
- Participants being geographically dispersed, potentially around the world, not necessarily known to each other, and potentially continuously changing as members invest and divest.
- Participants being capable of anonymous or pseudonymous involvement.

Some of these may be more aspirational than practically achievable and different DAOs may prioritise different features and so exhibit some but not others. For these and other reasons, this list will therefore often not reflect how organisations calling themselves "DAOs" operate in practice.

Practical implementations of DAOs

Whatever the label given to, or the precise features of, any particular arrangement, much of the discussion is highly aspirational. In reality, most "DAOs" do not operate in a fully autonomous or decentralised manner. Organisations of all types rely on individuals to perform certain tasks that automated processes cannot. DAOs envisage voting by (human) participants to determine how the organisation will develop. In many cases, a central group of people – often the original software developers who set up the organisation – will have a significant degree of control over the DAO's governance and operations (and potentially gain the

greater financial profit). Sometimes this more centralised control is increasingly dispersed over time in a move towards "increased decentralisation".

Many so-called "DAOs" now have dealings with the off-chain environment, purportedly entering contracts and holding real-world (off-chain) assets as well as assets held on-chain. Particularly in these circumstances, it is not possible to "opt out" of national and international laws merely by setting up a novel form of organisation. Indeed, many such organisations have started to use existing legal forms, such as limited companies, to benefit from the separate legal personality and limited liability they afford, and to assist with matters like tax certainty and regulatory compliance.

This model has become particularly prevalent due to the outcome of litigation in the US, where participants in a "DAO" were found to be members of an unincorporated association as defined under Californian and US federal law.[1] The court rejected arguments made on behalf of the DAO that it is a technology rather than an entity or group of persons. The finding that it was an unincorporated association meant that it could be sued and that members were potentially liable for regulatory breach. In addition, while DAOs may have started out as somewhat anarchic arrangements, the objectives of many users have evolved. DAOs are now of interest to a much broader category of user, attracted to different features of DAOs and, perhaps more importantly, their underlying technology, to different extents and in different ways. At one end of the spectrum could be an informal group of people organising themselves through a WhatsApp or Discord chat and motivated by the original aims of DAOs. At the other end, a sophisticated organisation or even a multi-jurisdictional conglomerate may wish to make increased use of DLT and smart contracts for their potential efficiency savings, while maintaining centralised management and decision-making.

As we explain in more detail below, we identify three broad types of arrangement that could appear along this spectrum. The legal characterisation of each is likely to be very different. At one end is a "**pure DAO**", that keeps as closely as possible to the original philosophical aims of DAOs, eschewing legal forms and arrangements. At the other is a "**digital legal entity**" – an incorporated organisation in a recognised legal form, but with a particular focus on the use of DLT and smart contracts in its governance and/or operations. In between – and representing a potentially vast range of different structures – there are "**hybrid arrangements**". These make some deliberate use of legal forms and/or legal entities but also retain a component that reflects the original aims of DAOs, such as aligning the interests of participants through on-chain decentralised control and, where possible, automating management through smart contracts.

1 *Commodity Futures Trading Commission v Ooki DAO*, 3:22-CV-05416-WHO, (N.D. CAL. DEC. 20, 2022); *Joseph Van Loon v Department of Treasury* 1:23-CV-312-RP. The definition of unincorporated association under US law is not the same as that under UK law.

Common questions arising with respect to DAOs

DAOs – broadly seen as organisations or arrangements of participants coming together for a common purpose and using DLT and smart contracts for aspects of their governance - vary considerably in their size and structure, giving rise to a range of questions for any particular DAO, including:

- What, legally speaking, is the DAO? For example, does it use a limited company or trust structure? Or, if it has not actively adopted a recognised legal form, how can it be characterised in legal terms? For example, could it be characterised as a general partnership or unincorporated association, or is it simply an arrangement of multilateral contracts between different participants?
- Who is liable for the actions of the DAO, and how can they be held accountable?
- Which jurisdiction's laws apply to determine the answers to these and other questions? If the DAO exists only online and has not adopted a recognised legal structure that links it to a particular jurisdiction, it may not be tied to, or associated with, any particular place.
- To which jurisdiction's tax and regulatory rules is the entity subject? Even if a DAO can be associated for private law purposes with a particular jurisdiction, it or its participants may have tax, regulatory or other liabilities beyond that jurisdiction.

The answers, and the ease of finding them, will depend on where a particular DAO sits on the "spectrum" that we identify above, as well as the peculiarities of the particular DAO. The analysis is therefore highly fact-specific. Because of the wide variety of arrangements, there are no answers of universal application.

What do DAOs do?

A DAO could, at least theoretically, exist in any sphere of activity from the commercial (for example, dealing in crypto-tokens) to the charitable (for example, raising money to help victims of war) or social (for example, managing sports club finances). At one extreme, the label has been applied to a small group of artists involved in creating NFTs. At the other, it is used by a DeFi lending platform with over 100,000 token holders that has tokenised $2.5 billion in real-world assets.

DAOs are often associated with decentralised finance or "DeFi" services. DeFi is an umbrella term which refers to the provision of traditional financial services – such as lending, exchange, asset management and insurance – without the use of traditional financial intermediaries. DeFi aims at decentralisation; instead of interacting with intermediaries, users interact with smart contracts. While in practice the level of decentralisation can vary widely across applications, it has been suggested that protocol DAOs are found behind almost all major DeFi products.

In any case, what a particular DAO does is less relevant for our purposes than what it is, legally speaking, and what that means for its rules of operation, liabilities and so on. The same is true of any legal study of a particular type of organisation: a paper looking at companies or charities as legal entities would focus on law applicable to the legal structure, rather than considering the business or other activities of any particular company or charity.

Nevertheless, it is of course necessary to be aware of the ramifications of particular commercial or other activities. For example, if a DAO is involved in DeFi it may be undertaking an activity that is regulated under UK financial services law and therefore must be authorised by the Financial Conduct Authority (FCA). This then engages the question of what the DAO is – what entity/person has to be authorised? If it is not authorised and the FCA wishes to take action for regulatory breach, who can the regulator pursue and who is liable? If the DAO purports to hold assets as part of its activities, who/what actually holds them? And, fundamentally, does UK regulatory law even apply if the DAO has no "base" in the jurisdiction and does not necessarily direct its activities at the UK in particular?

Explaining the features of DAOs

Here, we give a high-level introduction to the features we have identified as common, at least to some extent, across most if not all DAOs. We explain:

- the (very) basics of DLT and smart contracts (how DAOs operate);
- key participants in a DAO (who is involved in the use and operation of a DAO); and
- the core functions of DAOs, focused on decentralised governance/voting (what the DAO is doing).

DLT and smart contracts

The ability of DAOs to claim to be – to whatever extent – decentralised and autonomous comes from their use of smart contracts and DLT. Facilitation of decentralisation and autonomy was the ideological force behind the development of these technologies in the first place (as is evident from the original Bitcoin whitepaper).

Smart contracts

Smart contracts are computer programs that run deterministically, largely without the need for human intervention after they have been coded and set to run. Smart contracts tend to follow a conditional logic with specific and objective inputs: "if X occurs, then execute step Y".

Smart contracts are not in themselves contracts in the legal sense, although they can be used to define and perform the obligations of a legally binding contract. We call these "smart legal contracts".

Performance of a smart contract, or a smart legal contract, is "guaranteed" in the sense that human intervention is not required to facilitate performance. Participants can at least in theory be assured that things will happen as they are coded to happen.

DLT

A distributed ledger is a digital store of information or data. It is shared (that is, "distributed") among a network of computers (known as "nodes"). The nodes may be located anywhere in the world. Distributed ledger technology enables the operation and use of a distributed ledger. Blockchain is a particular type of DLT.

The distinguishing feature of DLT compared to traditional, centralised databases is that the ledger can function without maintenance or control by a central administrator or entity. This means that network participants do not have to reconcile their local databases with a ledger maintained by a central administrator or trusted third party. Instead, in DLT systems, participants approve and eventually synchronise additions to the ledger through an agreed "consensus mechanism". The consensus mechanism is set by the software underlying the DLT system. In general, it requires some or all of the participants to determine the validity of a proposed data entry. In some DLT systems, the consensus mechanism involves what are called "miners" - participants on a DLT system who solve a computationally intensive mathematical problem so that data can be added to the distributed ledger. Typically they will receive some reward for the effort required to provide this validation of the data entries.

The consensus mechanism is typically designed so that, once data is added to the ledger, it cannot (for practical purposes) be amended; it is said to be "immutable". This immutability is intended to mean that participants can trust its validity and transact with one another with confidence, on the basis that the system will operate in accordance with the rules encoded in the system.

DLT systems can be permissioned or permissionless and private or public. A permissioned DLT system is generally one in which authorisation to perform a particular activity on the DLT system is required. Permissioned systems tend to be private, meaning that the DLT system is only accessible for use by a limited group of participants. In a permissionless system, no such authorisation to perform activities on the DLT system is required. Permissionless DLT systems tend to be public, meaning that the DLT system is accessible for use by the public. Mining is typically a feature of permissionless DLT systems. Permissioned DLT systems may use different consensus mechanisms which do not involve mining. There is not a binary distinction between permissioned and permissionless systems, but rather various degrees and types of permissioning to consider.

Computer programs such as smart contracts can be recorded on a distributed ledger and performed by the computers on the network. Smart contracts, and smart legal contracts, can be deployed on a distributed ledger so that actions or contractual obligations expressed in computer code are performed automatically by the computers on the network. This enhances the automated or deterministic functioning of smart contracts, because the decentralisation of DLT dramatically reduces the ability to intervene in the operation of a smart contract.

DLT and smart contracts as used in DAOs

Smart contracts in DAOs will generally be used to set out, in code, the DAO's governance framework including its purpose, the roles and responsibilities of participants, and its incentive structure, as well as controlling the DAO's treasury (discussed further below). These can be referred to as the "DAO smart contracts" or "governance level smart contracts".

Beyond the DAO smart contracts addressing governance, there may be a further "layer" of smart contracts that facilitates the business or other activities of the DAO, particularly if these are conducted on-chain. We call these the "protocol smart contracts". In this context, a "protocol" is a set of rules by which a particular system is to operate. Developers may develop a protocol that might be implemented using smart contracts deployed to a DLT system to perform a particular activity, such as holding tokens, or to achieve a particular outcome, such as managing or distributing capital. For example, DeFi software (often referred to as a "DeFi protocol") may use smart contracts to implement a system for performing various financial operations.

Smart contracts used by DAOs and the distributed ledger systems on which they operate will generally be based on open-source software. Open-source software is software code that can be used, studied, changed and distributed by anyone. This allows for and encourages iterative development of the software itself by (often unrelated) developers in a collaborative and public manner. Open-source software is also transparent and verifiable by anyone. It can therefore be audited by third parties to check it will do what it is claimed it will do and identify any vulnerabilities.

The combination of smart contracts and DLT reduces or eliminates the need for parties to a transaction to trust one another because assurance is provided by the existence and operation of the software. This trustlessness is particularly important when potentially anonymous or pseudonymous parties are interacting solely through the internet and may have no personal or trust-based relationship.

Governance

At least as originally conceived, a key feature of DAOs is decisions made by community voting, rather than a centralised authority or management team – no CEO or board of directors calling the shots or controlling the money.

This community governance in DAOs is often conducted via governance tokens. A governance token is a cryptoasset – fungible or non-fungible depending on the particular DAO – that grants voting powers or rights to the holders of those tokens. Governance smart contracts provide a means by which members of the DAO who hold governance rights (token holders) can propose and vote on operational decisions and alter variants in the smart contracts. There may also be governance smart contracts which are used to manage the treasury and tokens (including issuance and buying back tokens) and register new members. Depending on the rules of the DAO, there will be a process for making proposals for a vote, generally to change the smart contract code. Holding more governance tokens is likely to mean greater voting power.

Votes may be on anything to do with the governance or activities of the organisation as far as this is permitted by the rules of the DAO. For example:

- At the level of the DAO smart contract(s) (the governance level), it may relate to a change of the purpose of the DAO or the rules of its operation.
- At the level of the protocol smart contract(s) (the activity / product / system level), it could be a vote on, for example, how to allocate funds collected for charity by a charity DAO, how to use an asset that a DAO has purchased, or how to allocate grants.

Smart contracts may be used to give effect to the outcome of a vote. This may be direct ("on-chain") and automatic, with the options built into existing code so that the outcome of the vote is automatically implemented. Alternatively, it may be some version of indirect ("off-chain") voting and implementation. In the latter case, votes may be cast on-chain or simply in message boards or chat groups, and the smart contract code must then be updated to reflect the result by one or more developers.

Whether the effect of votes is automatically implemented, or relies on implementation by human actors, affects how certain the rights of the token holders are, how "decentralised" and "autonomous" the arrangement is, and how "trustless".

Token-based governance may mean that decisions are slower and less efficient than in a traditional organisation when a single officer or central board is empowered to make quick decisions when necessary. Particularly at the beginning, when there are many decisions to make, decision-making may be limited to a small group (such as the original developers), before voting rights are distributed more widely over time in what is referred to as "progressive decentralisation."

Another risk is the concentration of power in situations where individuals retain or accumulate large numbers of tokens with corresponding voting power, which would frustrate the supposed aim of distributed and decentralised control. Some evidence suggests that in many DAOs, token holding is highly concentrated in a small population of holders.

As in many other situations where individuals are asked to vote, voter participation in DAOs is often low. This may be due to voter apathy and/or lack of understanding when decisions are on complex and technical matters. Low participation could compromise the functionality of the organisation as well as undermine claims about control being distributed and decentralised. If this is an issue, a DAO may allow for delegation of voting power to another party, or the setting up of sub-committees to determine matters on a particular topic requiring specialist knowledge. In some cases, voting is rewarded with additional governance tokens.

Token holders

It is likely that the original developers of the DAO will keep some – potentially a majority – of the tokens. Other participants might acquire tokens in various ways, including by receiving them in return for early investment in the DAO, buying them from existing token holders and receiving them in return for contributing something to the DAO. Tokens may even be sent via an unsolicited airdrop (when tokens are sent to public addresses), perhaps to increase the number of token holders and ensure a spread of control, or to raise the profile of the DAO.

Governance and other tokens: functions and status

A DAO might issue more than one type of crypto-token.[2] For example, in addition to governance tokens, the DAO could, as its business activity, issue native tokens which can be used as a form of "currency" to exchange for other goods or services. Or it might otherwise deal in or with other tokens (particularly those organisations which are set up to provide decentralised finance (DeFi) or crypto-wallet services).

Governance tokens that give the holder voting/governance rights may, depending on the terms and conditions of the particular DAO, represent contractual rights. DAO tokens are also likely to be transferable and therefore tradable, and to have a price.

Tokens in the regulatory context

Cryptoassets are generally unregulated in the UK.[3] However, activities relating to cryptoassets are regulated in this jurisdiction under three regulatory frameworks:

- **Anti-money laundering framework:** Cryptoasset businesses that fall within the scope of the Money Laundering, Terrorist Financing and Transfer of Funds (Information on the Payer) Regulations 2017 must register with the Financial Conduct Authority (FCA) before starting business. The 2017 Regulations provide that the FCA must determine that the applicant's management and owner are "fit and proper" and that the applicant has satisfactory anti-money laundering systems and controls in place. The 2017 Regulations apply depending on what is done with the cryptoassets and whether this creates a money laundering risk.
- **Financial promotions framework:** This framework sets out what financial promotions are and are not permitted and is relevant where certain products or activities are aimed at or otherwise "capable of having an effect in" the UK. Cryptoassets have recently been brought within this regime.

2 An example is Bored Apes. They have ApeCoin (governance) and Bored Ape NFTs (a product).
3 Unless they fall into certain categories such as specified investments (discussed below), electronic money or financial instruments under MIFID II. See FCA, Guidance on Cryptoassets (2019), Appendix 1, www.fca.org.uk/publication/policy/ps19-22.pdf.

- **The regulated activities framework:** This framework sets out all the activities that fall within the financial services regulatory framework under the Financial Services and Markets Act 2000 (FSMA). It applies to cryptoassets where the features of a cryptoasset mean that it falls within the definition of a "specified investment". The specified activities and investments are set out in Schedule 2 to FSMA and in the Financial Services and Markets Act 2000 (Regulated Activities) Order 2001 (the RAO). Firms are required to obtain FCA authorisation in order to operate where they undertake "specified activities" in relation to "specified investments". In some ways, governance tokens might look like company shares in that they may be issued in exchange for investment into the DAO, and give corresponding voting rights, which could result in them being regarded as specified investments.

DAOs may fall within these frameworks as a result of activities linked to their governance tokens: for example, advertising their tokens to potential participants and issuing governance tokens to participants. These activities are common to many DAOs due to the way DAOs are set up at an organisational/governance level (that is, token-based governance). DAO activities could also be caught by the regulatory regime at the product level based on the nature of the DAO's business or service. DeFi DAOs are the most obvious example where this could be the case. Activities carried out at that level may fall within these regulatory frameworks in the same way as if they were being carried out by a traditional organisation.

Participants

As mentioned above, the personal identity and location of some or all DAO participants may be anonymous or pseudonymous. Challenges in identifying individuals give rise to various difficulties, from compliance with law or regulation requiring personal data (such as tax law and anti-money laundering regulations) to identifying responsible persons when enforcement action is required. Here we describe the main categories of participants that might be found in the DAO ecosystem:

- **Software developers:** DAOs are all likely to involve software developers (software engineers who design and write software) developing computer code that is used to create distributed ledger/blockchain systems and smart contracts.
- **Token holders:** Token holders are likely to have the right to vote on changes to the smart contracts, effectively voting on decisions as to how the DAO is run, but often do not in fact use those rights.
- **Investors/shareholders:** Particularly in DAOs using recognised legal entities such as limited companies, there may be other investors, including potentially equity shareholders, instead of or as well as governance token holders.
- **Operators/contributors:** Depending on the type of DAO, these may include:
  - Contributors, who are individuals who participate in and contribute to the organisation. Software developers are one form of contributor. Others may participate in operational functions such as treasury management and voting oversight. Contributors are often paid for their work, usually in native tokens, stablecoins, or other crypto-tokens.

  - Node operators (miners/validators) who support the underlying distributed ledger/blockchain.
  - Managerial operators that operate the day-to-day functioning of the DAO such as multisignature signers who oversee treasury or other wallets, deploy code changes to smart contracts, manage voting by token holders, and other operations in accordance with the DAO's purpose. They may be employees and/or rewarded for this contribution with tokens.
  - Executives such as directors or partners if using a legal structure.

- **Customers/clients:** if the organisation offers an external service or product, such as DeFi.

What is a DAO, legally speaking?

Above, we have described the key concepts relating to DAOs and how they are generally driven by the operation of software code. Beyond this, there remain important legal questions as to the proper legal characterisation of any particular DAO, and the relationships between various participants in such arrangements.

A DAO may choose to adopt traditional, legally-recognised organisational structures, such as limited companies, partnership models, offshore trusts and foundations, or DAO-specific legal entities (which have recently been introduced in some jurisdictions), or a combination of several of these. The entity could be co-extensive with the DAO, or it may be used only for a specific function, such as to employ the developers, or to hold real world property. If only part of the DAO is "wrapped" in a legal entity, there may be questions about the nature of the relationship between the legal entity and the non-wrapped part of the DAO, and about the legal characterisation of the non-wrapped part.

It may be easy to say what a particular DAO is if it has chosen to use one or more recognised legal entities and is therefore a hybrid arrangement according to our "spectrum" approach introduced above. Where there is a legal entity in any capacity, the legal entity or entities in question will be subject to the usual legal, tax and regulatory requirements of the jurisdiction in which they are set up.

But a DAO may have taken no active steps to set up a legal entity. A group of people – developers, token holders etc – may have worked together or interacted with each other without giving any thought to their collective legal status or legal liability, or may have chosen to avoid existing legal forms for philosophical reasons. We call these "pure DAOs". If the participants have not made a positive choice as to status, it may be necessary to work out retrospectively what the arrangement is or was from a legal perspective. Whether the participants like it or not, the arrangement still exists in the real world with its rules and liabilities. This could be a difficult exercise, especially if the DAO does not fit easily within existing structures that can arise as a matter of law (rather than requiring active registration), such as general partnerships or unincorporated associations.

Particularly in the case of pure DAOs which may have no particular link with any single jurisdiction, it might be difficult to identify which country's laws or regulatory regime applies to determine these issues – but that is a separate question which will have to be answered on a fact-specific basis, involving rules of private international law.

What a particular DAO is from a legal perspective will affect a great deal of its potential analysis, including the rules for its operation, the liability of participants, how it can enter into contracts and own property, and how it is taxed. DAOs that have taken active steps to include a recognised legal entity within their structure are therefore very different from those that have not. The difference in the kinds of issues that arise between these different types of arrangement is so great that in some respects it is difficult to talk about them together, even if they are all "DAOs" according to our very broad definition.

Our impression is that, as DAOs have developed over the past few years, more or perhaps most DAOs are proactively adopting legal entities with separate legal personality. This will aid their ability to transact in the "real world" (for example, by opening bank

accounts and entering into contracts) as well as limiting participants' potential personal exposure to legal liabilities, but inevitably moves them further away from their original goals.

Why does it matter what a DAO is?

It may be necessary to characterise the legal relationship between various actors within a DAO for a variety of reasons.

Liability

A key question is who is liable if something goes wrong. What happens when actions by or on behalf of the DAO give rise to liability in tort (such as negligence), or if there are any regulatory breaches or criminal conduct? Who or what is responsible for the actions of the DAO?

Civil liability

As we discuss below, a legal analysis of a DAO could conclude that all or certain participants within a DAO are part of a general partnership or unincorporated association, or part of a network of contractual and/or agency relationships. This may in turn give rise to individual participants having personal liability for the actions of the DAO, because the DAO does not have its own legal personality that can shoulder these liabilities. For example, in a general partnership, all partners are jointly liable for the debts and obligations of the partnership.

The prospect of identifying individuals who can be held liable for the acts of the DAO also raises questions about whether some participants (such as a DAO's founders, or those who hold the most tokens or have the power to amend the code) can be held "more liable" than other participants whose involvement is more passive or who in practical terms have less control.

If the DAO has used a formal legal entity such as a company with a "legal personality" separate from that of its participants, the answers are likely to be more straightforward and the DAO itself will shoulder much of the burden since, as a legal person, it can hold property, enter into contracts and sue and be sued in its own name, and the "corporate veil" is only lifted in limited circumstances.

Criminal liability

The situation in criminal law is similar but there are some important differences and distinctions.

Most criminal offences are created with natural persons in mind, but such offences may explicitly or implicitly extend to associations (such as companies or partnerships). How a particular offence committed "by" a DAO or a DAO participant could be prosecuted therefore depends both on how the DAO is characterised and the nature of the offence itself.

Most general criminal offences require a particular state of mind (or "mental element"), such as an intention to carry out the act or to bring about some result, knowledge of certain matters, recklessness or dishonestly. When an organisation can be prosecuted for an offence requiring a particular mental element, the question arises as to whose state of mind is to be attributed to it. This will depend on the particular offence in question, but could, for example, be a senior manager in that organisation. Many offences that apply explicitly to non-natural persons are for regulatory offences, and often these are 'strict liability' offences that do not depend on whether the act was intentional.

Capacity to enter into contracts, own property or hold funds

If a party purports to contract with a DAO, they would need to know with whom or what they are contracting. If a DAO has not used some formalising element such as a limited company, it is likely to have no separate legal personality and therefore no ability to, for example, enter into contracts or own assets itself. How then is property owned or a contract entered into? And if the DAO holds money on behalf of its token holders, in what capacity is that money held?

Roles and responsibilities

What duties do the various participants (including developers, token holders, and potentially miners/validators) owe each other, third parties and the world? Those who participate in DAOs in various capacities, including in governance and/or software development, for example, need to know the content and extent of their duties. Might they, for example, have duties to token holders akin to those of a company director to shareholders? And might developers owe a duty to other participants in the organisations to safeguard their economic interests, through a tortious duty of care or possibly even as fiduciaries in certain circumstances?

Regulation and tax

If a DAO requires authorisation for its activities – for example, if it carries out regulated financial services – it will be necessary to know what the organisation is in order to determine who or what must apply for authorisation, and how the DAO and/or its participants should pay tax.

The borderless nature of a DAO also raises questions about where tax is payable – but these questions arise (albeit with perhaps easier answers) with many types of organisation that operate across jurisdictions. They are the subject of international agreement and again will be easier to answer in respect of a recognised legal entity.

Jurisdiction and extra-territoriality

Companies and other traditional organisations are usually required to establish in a particular location, for example by registering with a domestic registrar in the relevant jurisdiction and/or by establishing a head office in that country in order to carry on business there. The assumption is that the organisation will be subject to the legal, regulatory and tax provisions of the jurisdiction in which it is set up.

A DAO that has not used a domestic legal entity in its structure or otherwise established itself in any one jurisdiction may not be tied to, or associated with, any particular place. This is not unique to DAOs, but the use of DLT can cause additional challenges because the DLT system can be said to exist "everywhere and nowhere"; there may be nodes all over the world. The participants in a DAO – its creators and users – may equally be spread all over the world and may be difficult to identify or locate. The decentralised nature of a DAO and the particular ways in which its users interact with the underlying smart contracts make it impossible to know how many individuals engage with the smart contracts from a particular jurisdiction.

The international or borderless nature of some DAOs may mean that it is challenging to know to which laws it is subject. This may give rise to different questions and answers in different areas of law. The focus of our work is private law, which concerns relationships between private parties (including individuals and business) including the characterisation of businesses and the rights and liabilities of individuals and businesses, including in contract and tort. However, DAOs and/or DAO participants will also be subject to public law (including regulatory, tax and criminal laws). How these will apply will depend on the type of DAO and the detail of the relevant rule (for example, whether it only applies to things that happen in England and Wales, and how it relates to the actions of a decentralised DAO).

In many cases, the DAO participants themselves may not have given any thought to the laws to which they might be subject. However, if the point were to be considered, individuals and entities have some choice as to which law applies for private law purposes to govern their relationships with other private parties. For example, a valid contractual choice of law will determine the law governing the private law relationship between the parties under a contract. However, that choice of law will not affect the regulatory regime that applies to the parties as a matter of public law, because parties cannot contract out of mandatory rules.

A spectrum of DAOs: pure DAOs, hybrid arrangements and digital legal entities

As indicated, we use the term "DAO" to cover a wide range of technology-mediated structures or organisations of participants that use smart contracts, DLT and, usually, some kind of community voting. While the original idea of a DAO was somewhat anarchic, our understanding is that DAOs are increasingly using legal entities within their structure. Using a legal entity within the structure of a DAO will connect the DAO with a particular jurisdiction and can provide a variety of benefits including:

- separate legal personality giving the DAO the capacity to enter into contracts and hold assets in its own name (and to sue and be sued in its own name);
- limited liability for its participants, so that participants cannot be held liable for an amount larger than their current and promised investment in the DAO;
- (potentially) clearer characterisation of relationships between participants and with the outside world;
- the ability to interact more easily in the off-chain world more generally, such as by opening bank accounts;
- increased certainty about tax status and jurisdiction;
- clearer integration in frameworks for compliance and regulation.

For some DAO participants, using a legal structure might involve significant compromises in their philosophy. This could include an inevitable and significant degree of centralisation, a hierarchy among participants (such as the appointment of a board of directors), loss of anonymity or pseudonymity for some or all of its participants, the introduction of reporting requirements, and the addition of duties (such as directors' duties) which may frustrate the focus on community voting.

Whatever the philosophy or priorities behind a particular DAO, whether it does or does not actively incorporate a legal entity can make a significant difference to its legal implications. Here, we introduce some different ways that a DAO might be arranged, sitting along a spectrum:

"pure" DAOs: arrangements implemented through smart contracts with very limited off-chain activity, no incorporated legal structure and, often, a rejection of dependence on law and legal institutions for their existence (although they may well still attract legal and regulatory consequences);

hybrid arrangements: arrangements combining smart contract-based coordination with deliberate use of one or more legal forms or separate legal entities; and

digital legal entities: arrangements where an incorporated legal entity adopts digitalisation through the use of smart contracts or DLT in its operations or governance.

Pure DAOs

Pure DAOs sit at the more decentralised and autonomous end of our spectrum: they are decentralised and reject dependence on law and legal institutions for their existence.[4]

The key characteristic of a pure DAO is that it deliberately does not use any legal entities within its structure. Instead, it relies on technology (code, smart contracts and DLT) to set the rules according to which participants in the organisation interact (including for the purposes of governance) and to automate certain processes and functions. Its governance processes are designed to allow for decentralised governance; that is, for decision-making within the organisation to be dispersed amongst participants rather than sitting with a central decision-making body. Diagram 1 on the next page shows one example of how participants may interact in a pure DAO.

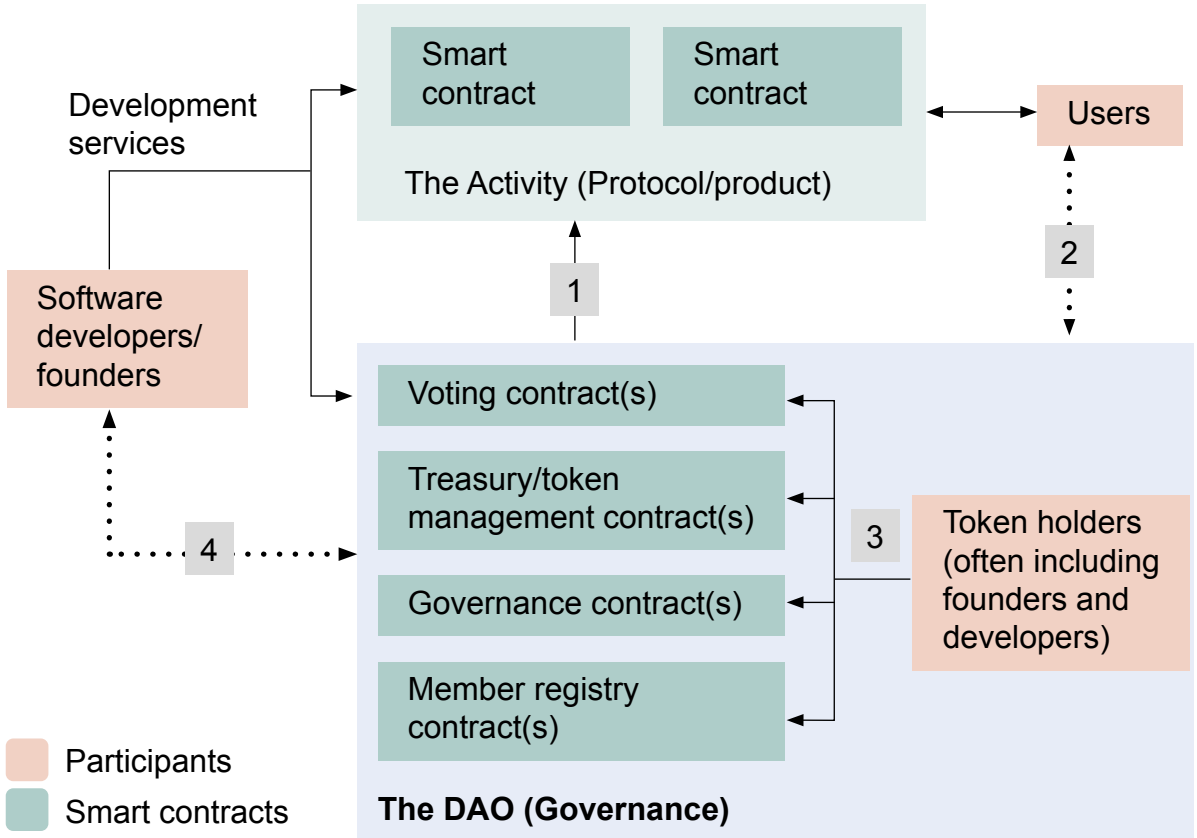
Despite not actively choosing to use a legal entity within its structure – and perhaps consciously hoping to avoid legal characterisation entirely – it is nevertheless possible (and arguably necessary) for a group of people who organise themselves as a pure DAO to attract some form of legal characterisation. This question may arise, or require definitive answers, only retrospectively and in a particular context, such as where some form of legal action is taken against the pure DAO or some or all of its participants. This could involve, for example, a civil action by an injured third party, enforcement action by a regulator or prosecution under criminal law. A pure DAO may be found to include a general partnership or unincorporated association, or involve a collection of legally enforceable contracts between participants, or even a trust structure. These legal characterisations can arise under the law of England and Wales without the need for incorporation or registration.

How a particular pure DAO is characterised will be a fact-specific enquiry decided based on the application of long-established, technology-neutral tests under the general law. As a consequence, the legal duties that members of a particular DAO may have to each other and to any counterparties will not arise from some arbitrary designation and are not, for lawyers at least, wholly unpredictable.

Because these tests are technology neutral, they do not cease to apply because DAO participants operate on a blockchain rather than through in-person interactions. DAOs will neither be unfairly exposed to, nor unfairly protected from, the relevant characterisation and legal consequences in England and Wales merely because of their use of novel technology. With that said, some of the common features of DAOs make it less likely that the tests for some of these legal characterisations will be met.

4 Although they may well still attract legal and regulatory consequences.

Diagram 1: Example of how participants may interact in a pure DAO



1	Alterations to the protocol smart contracts or product offering are determined automatically as a result of the outcome of governance votes, or in some cases, by development work commissioned for the DAO as a result of voting by token holders.
2	The relationship between token holders in the governing DAO and users of its protocol or product will depend on the factors discussed in chapter 3 of our scoping paper.
3	Token holders hold governance tokens that allow them to participate in the DAO. Their capacity to participate is determined by the DAO's smart contracts. The governance contract allows token holders to alter those contracts. In some pure DAOs there will be "sub-DAOs" or committees, a smaller group of people accountable to the DAO but responsible for particular aspects of the organisation, such as treasury management. For simplicity, here we present a completely decentralised DAO in which all governance authority rests with all token holders.
4	When a pure DAO engages a counterparty to perform work on its behalf, who is liable on the contract will depend on the factors discussed in chapter 3 of the scoping paper.

The components used above are indicative and non-exhaustive examples that may be used.

The actual composition and functionality of the smart contracts will be fact specific.

DAOs as general partnerships or unincorporated associations

A frequent concern of stakeholders is that pure DAO participants will be characterised as a general partnership, jointly liable for liabilities incurred by one another and with onerous duties to act in each other's best interests, contrary to participants' intentions. It is possible for a pure DAO to be characterised as a general partnership and its use of novel technical features, such as the business being governed through on-chain voting, does not preclude this. However, the decentralisation of governance to often pseudonymous and changing members, along with the nature of the activities of archetypal pure DAOs and the means by which participants are able to make financial gains, may make it unlikely that a court would conclude that the participants agreed to carry on a business in common with a view to profit, and bear mutual duties as a consequence.

Some DAOs may be best characterised as an unincorporated association, with participants interacting according to rules set out in smart contract code in order to carry out the non-business purpose of governing the DAO. Members of an unincorporated association will generally only be liable for their own acts or the acts of their agents and do not owe each other duties in the same way as partners.

Other possible characterisations

Participants in a DAO may have obligations to one another under contract, even if their relationship does not amount to a general partnership or unincorporated association. In most cases, contracts are not required to be in any particular form and do not even need to be written down or otherwise recorded.

The code in a smart contract can constitute a legal contract, therefore even if participants are only interacting with code or each other via code, this could be sufficient for a legally enforceable contract to exist.

If a pure DAO is not characterised as a general partnership or unincorporated association and there are no legally binding contracts, this does not of course mean that participants are outside the reach of the law. The relationships between participants, and between participants and third parties will still be subject to other legal analyses and so participants may still have liability, for example, in torts such as common law negligence, or by way of fiduciary duties, unjust enrichment or under a trust. Criminal and regulatory law will also still apply.

Fiduciary duties of software developers?

One question currently being asked in the market is whether software developers owe fiduciary obligations to users of their software and owners of cryptoassets manifested by that software. This question has received attention as a result of the recent (and now discontinued) **Tulip Trading** litigation, which concerned software developers although not in a DAOs context.[5] Put (very) simply, a fiduciary is an individual upon whom the law imposes an obligation of "single-minded loyalty" to another — their principal. This obligation exacts a unique and significant constraint on the fiduciary's personal autonomy and forbids any self-interested behaviour where the fiduciary's personal interests conflict with their duty to their principal. Such obligations are imposed in certain settled categories of relationship, such as between trustee and beneficiary or between partners in a

5 *Tulip Trading Limited v Van der Laan* [2022] EWHC 667 (Ch); *Tulip Trading v Van der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16.

partnership, in order to give the principal the protection the relationship demands. Development of fiduciary duties outside of these categories may occur but only in exceptional circumstances.

There would be no policy or legal justification for characterisation as a fiduciary merely based on the act of open-source software development (whether in a DAO or otherwise), and such a characterisation would have a severely chilling effect on the development of open-source software. That said, just as in non-DAO situations, the application of existing legal principles might, in some specific situations, lead to a particular developer or group of developers being found to be a fiduciary in a particular set of circumstances. We think such situations are likely to be very rare. We think it would be helpful for someone – whether the courts or perhaps a body such as the UK Jurisdiction Taskforce – to carry out a fuller analysis of whether and how the law of fiduciary duties might be applied appropriately to software developers and to highlight the exceptional nature of the duty.

Hybrid arrangements

Hybrid arrangements intentionally combine smart contract based coordination (that is, a pure DAO arrangement) with one or more legal forms or entities. The pure DAO elements of the hybrid arrangement's governance will exhibit characteristics of decentralisation and autonomy while those relating to the legal entities within the arrangement may be more centralised and less autonomous. Encompassing some of the functions of a DAO within a legal entity is sometimes known as 'wrapping'. Adoption of a legal wrapper can improve a DAO's ability to protect its members from liability and interact with the off-chain world.

Different hybrid arrangements use legal entities in different ways as part of their structure. They may use them just for specific functions, for example, to hold intellectual property rights relating to software or to employ staff. Where legal entities are used in this way, the greater part of the hybrid arrangement's governance is likely to remain within the pure DAO element. Alternatively, a hybrid arrangement may use legal entities in such a way that some or all major governance decisions are made by the governing body of the legal entity. One reason for adopting this approach may be to ensure limited liability for participants making governance decisions; whether this is fully successful may depend on how the residual technological features are operated and the relationship between the wrapped entity and non-wrapped residual part of the DAO.

For hybrid arrangements, key questions will be what type of legal entity or entities to use, and in which jurisdiction? Depending on the priorities of the DAO's decision-makers, both give rise to important considerations such as:

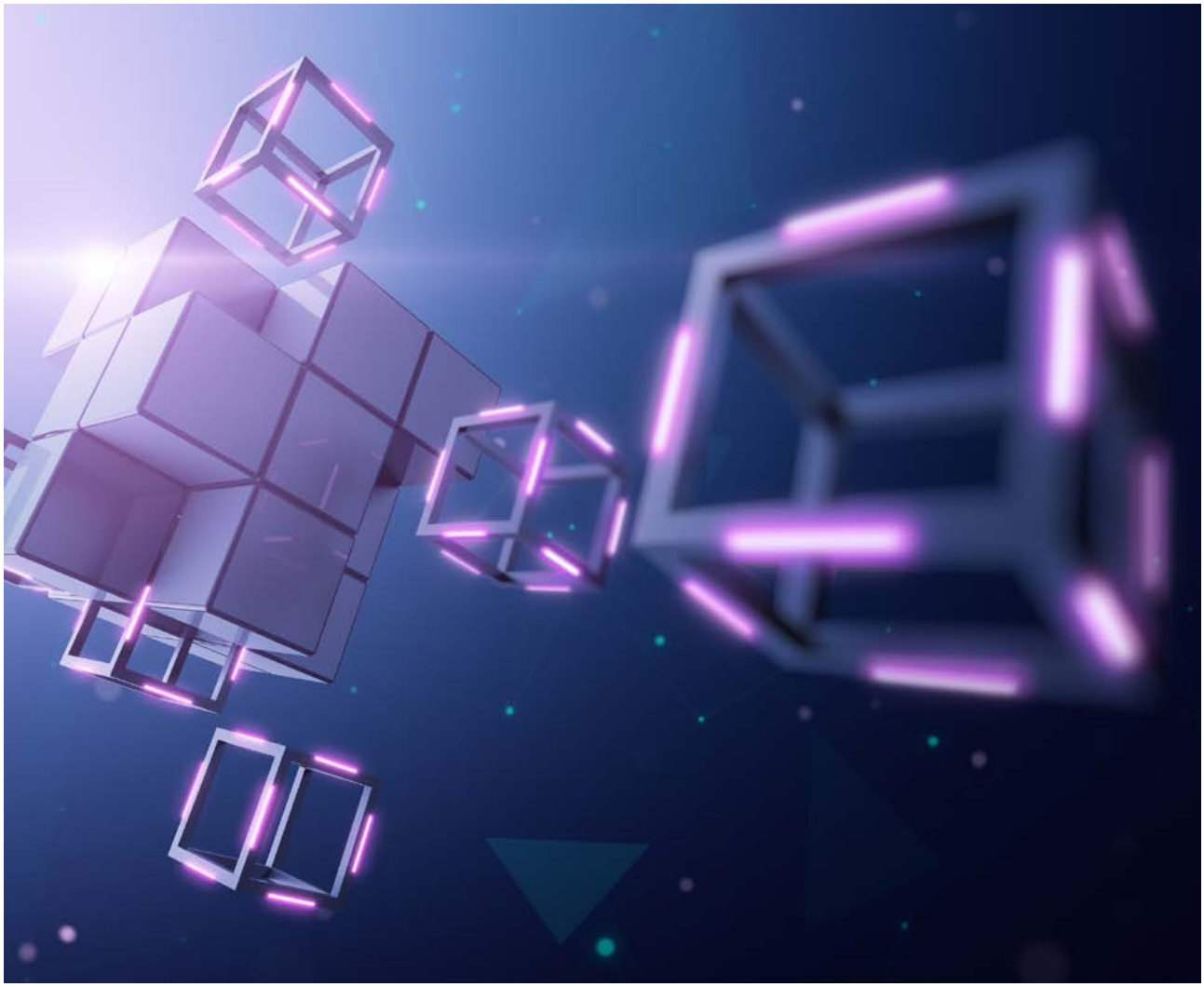
- What benefits does a particular legal entity give (such as limited liability) and at what cost (for example, loss of anonymity; reporting requirements; directors duties?)
- What are the laws (including, for example, employment law), regulatory requirements and tax arrangements in a particular jurisdiction?

There are a range of different legal entities in this jurisdiction and abroad that could be used, although there does not appear to be any "perfect" entity fit. Few if any DAOs are currently set up under the laws of England and Wales (although many refer to the law of England and Wales in their governing documents). We have been told that this is, in part, due to some of the requirements for transparency, including in relation to anti-money laundering requirements, and lack of suitable legal vehicles.

Some jurisdictions, for example Wyoming, have introduced DAO-specific forms of legal entity, designed to attract DAOs to the jurisdiction, but these have sometimes been criticised for being more onerous for DAOs rather than less. Many DAOs using legal entities are established in US states where the founders are based (making use of entities such as the limited liability company (LLC) or unincorporated non-profit association (UNA)). In many other cases, DAOs establish legal forms in offshore locations such as Cayman Islands or Guernsey, where forms such as purpose trusts and foundations allow for greater levels of anonymity for participants, plus tax and other benefits.

Digital legal entities

A digital legal entity is an incorporated legal entity which makes use of technology such as DLT and smart contracts in its formal governance and/or operational arrangements. The use of this technology is enshrined in the rules of the legal entity. DLT-based systems may be applied to digitalise the operation and administration of the entity. For example, a private company limited by shares may wish to use various technologies to issue tokenised shares, substantially automate shareholder voting, or use DLT-based rather than centralised registers. These types of entities are largely theoretical in this and most jurisdictions due to statutory restrictions on the form of, for example, shareholdings and fund interests.



Next steps

A central focus of this project was to simply identify how the current law is likely to apply to DAOs. Beyond this, we have not been asked to make formal recommendations for law reform at this stage, but rather to identify options for legal reforms or innovations that could usefully clarify the status of DAOs and support the growth of digitalised organisations in England and Wales.

Our view is that there is no current need to develop a DAO-specific legal entity for England and Wales. This is in part because there is no consensus around what such an entity should look like and where its parameters should lie, and in part because of the general desirability of organisational law remaining technology neutral.

There is little consensus on what a DAO is and what it is not. Not all DAOs operate in the same way. There is no silver-bullet solution: trade-offs between broader policy objectives (such as transparency of ownership) and ease of use by DAOs (often with pseudonymous members) are inevitable in any attempt to truly accommodate DAOs as originally conceived. There is also a risk that in attempting to accommodate a particular technological development, ad hoc and technology-specific legislation will obstruct the very dynamism it is trying to facilitate. The case for offering DAOs different, and potentially less burdensome legal, regulatory or tax treatment compared with traditional organisations has not (yet) been made out.

That said, ensuring existing legal forms do not exclude the take up of new technologies that achieve the same functional objectives is clearly worthwhile to promote innovation in governance and operations. On the one hand, this involves considering whether there is a sufficient range of appropriate legal vehicles available to exploit the potential of new technology to democratise governance (where desired) and improve efficiency. We have identified a few areas where further work would be useful to explore how some of these new types of arrangements for collaboration could be accommodated under the law of England and Wales, including:

- Proceeding with the Law Commission's planned review of trust law. This will consider – in general terms rather than in the DAO context specifically – the arguments for and against the introduction of more flexible trust and trust-like structures in England and Wales.
- Considering the case for the introduction of a limited liability, not-for-profit association with separate legal personality similar to the UNA structure sometimes used by DAOs (along with other organisations) in the US.

However, in our view, the "low-hanging fruit" for promoting the growth of DAOs and the digitalisation of other organisations in England and Wales is reviewing and removing requirements that unintentionally limit the use of new technologies. It is possible that there is a case for adjusting underlying policy objectives, such as the balance between promoting transparency and jurisdictional competitiveness. But the easier case to make is for removing obstacles in the law that are there by default. With that in mind, we suggest the following:

- A review of company law, and that of other incorporated entities such as limited liability partnerships, to identify reforms to make it easier for organisations to leverage DLT and other technology at the governance level of a legal structure and still meet compliance requirements. We identify some potential first steps, such as consideration of legal changes facilitating share and fund interest tokenisation and automated member registers, in our scoping paper.
- A review of anti-money laundering regulation to consider whether the same policy objectives can be achieved in a manner more compatible with the use of DLT and other technology.

A full list of next steps relating to further work we have identified can be found in Chapter 7 of our scoping paper.