How Do You Incorporate an Entirely Digital Corporation?

by Ronald Chichester[1]

1. Abstract

This paper describes what attorneys need to know about incorporating companies that rely heavily – if not exclusively – on blockchains. Because technology is central to this topic, references will be provided for a brief introduction to: cryptocurrencies, blockchains (which is the underlying technology to cryptocurrencies), smart contracts, and distributed autonomous organizations. Finally, this paper will discuss the peculiar requirements for incorporating a blockchain-based company.

2. What is a Cryptocurrency?

Most people's introduction to blockchains comes from their experiences with cryptocurrencies. According to Forbes, a "[c]ryptocurrency is decentralized digital money, based on blockchain technology.[2] Examples of cryptocurrencies include Bitcoin[3] and Ethereum.[4] Ethereum has the added benefit of executing code that controls digital value.[5] Essentially, cryptocurrencies enact a different trust paradigm, wherein middle*men* (banks and governments) are replaced by middle*things* (computers and networks). Cryptocurrencies rely on three major elements: peer-to-peer networking,[6] encryption,[7] and game theory.[8] As with most national currencies, most cryptocurrencies are fiat, in that they are not backed by some finite commodity, such as gold. Cryptocurrencies are essential for monetary transactions involving blockchain-based companies. Once companies and individuals have accounts (addresses) on a particular cryptocurrency, that company or individual may conduct transactions with any other individual or company that has access to the same cryptocurrency. There are also exchanges for cryptocurrencies, such as Binance.[9]

3. What is a Blockchain?

The underlying technology used to implement a cryptocurrency is called a *blockchain*. A blockchain is a computerized ledger that is suitable for use within an organization, or within

---

1 Ronald Chichester is a solo attorney who is a past chair of the Business Law Section and a past chair of the Computer & Technology Section of the State Bar of Texas. His area of practice includes computer torts and computer crimes.

2 Kate Ashford and John Schmidt, *What is Cryptocurrency?*, Forbes Advisor (December 18, 2020) https://www.forbes.com/advisor/investing/what-is-cryptocurrency/

3 https://bitcoin.org/en/ ("Bitcoin is an innovative payment network and a new kind of money.")

4 https://ethereum.org/en/ ("Ethereum is a global, open-source platform for decentralized applications.)

5 *Ibid.*

6 *See, e.g.,* Peer-to-peer, https://en.wikipedia.org/wiki/Peer-to-peer

7 *See, e.g.,* Encryption, https://en.wikipedia.org/wiki/Encryption

8 *See, e.g.,* Game theory, https://en.wikipedia.org/wiki/Game_theory

9 Binance.com, https://www.binance.com/en

multiple organizations and individuals. Note, in many jurisdictions, blockchains are often referred to (generically) as *distributed ledgers*.

Blockchains have two or more physical components: at least one *node* and a way to get information to/from the nodes. Each node in the blockchain is running identical software precisely so it can process transactions like every other node. The software can be open source or it can be proprietary, but it must be identical to every node on the blockchain.[10] The software running on the node validates (or not) the transactions. If there are more than one node, they are typically connected to each other by a peer-to-peer network. Users place their transactions on the peer-to-peer network, and the nodes race to validate it. If validated, the transaction is encrypted and the encrypted record is inserted into a block. Then the block is cryptographically *hashed*[11] and that hash value can be shared with the other nodes to ensure that all of the nodes agree. Typically, once at least half the nodes agree on the validity of the transaction, then the transaction is considered validated. Each block is then hashed with all previous blocks to form a chain of blocks, hence the name blockchain. Generally, if a node's hash doesn't comport with the other nodes, then that node replicates the blocks from the other nodes to bring itself into compliance. There is an incentive for the nodes to comport with each other. If a node is not compliant, it cannot be trusted to execute further transactions, rendering that node useless to the blockchain, and the owner of the node precluded from remuneration for hosting that node.

While there is no standard architecture for blockchains, in general, most are considered either *public* or *private*. Private blockchains are controlled by a single entity and are generally used to facilitate transactions between a small group of trusted entities. Public blockchains, however, are available to the public for transactions between any set of companies or individuals that don't need to trust each other. Bitcoin is an example of a cryptocurrency that is on a public blockchain.

The design of the blockchain is vital to the purpose of the resulting transactions. While the basic design of blockchains *can* be robust and secure, the design decisions enacted can affect on *how* robust and secure the resulting blockchain will be. The linchpin for blockchain design is the number (and ownership) of the nodes. The greater the number of nodes (and owners), the more robust the blockchain because the more difficult it is to validate an improper transaction. Unfortunately, this design makes it difficult to update the software for the nodes, and is as intended. However, updates and/or hostile takeovers of a blockchain are possible, and that process is called a *fork*.[12] How easy (or difficult) it is to fork a particular blockchain design is an important risk factor for investors.

A truly detailed introduction to blockchains is outside the scope of this article. Fortunately, there are many good introductions to blockchain on the Web and YouTube, and I commend your attention to those resources.[13] For a detailed explanation of the trust paradigm (and legal

---

10 For example, Bitcoin node software is open source, and is available at: https://bitcoin.org/en/full-node

11 *See, e.g.,* Cryptographic hash function, Wikipedia, https://en.wikipedia.org/wiki/Cryptographic_hash_function

12 *See, e.g.,* Coin Idol, *Definition of a Cryptocurrency Fork; Why are They Necessary?*, Coin Idol.com (February 9, 2020), https://coinidol.com/definition-cryptocurrency-fork/

13 *See, e.g.,* How does a blockchain work – Simply Explained, https://www.youtube.com/watch?v=SSo_EIwHSd4,

implications thereof) made possible by blockchains, see the seminal book on blockchains and resulting trust paradigms by Kevin Werbach.[14]

4. What is a Smart Contract?

"A smart contract is a self-executing contract with the terms of the agreement between buyer and seller being directly written into lines of code. The code and the agreements contained therein exist across a distributed, decentralized blockchain network. The code controls the execution, and transactions are trackable and irreversible."[15] The code can run on a non-proprietary cryptocurrency blockchain, such as Ethereum,[16] or on a private blockchain. When a software application is implemented on a distributed blockchain, that application is called a "dapp." and a smart contract is an example of a dapp.[17] Incidentally, private blockchains are easy to set up. Much of the software is open source[18] and readily available. In fact, you can set up your own Ethereum blockchain for development purposes using software such as Truffle and Ganache.[19] This means that the cost of entry for a cryptocurrency is very low, which accounts for their proliferation.

When two companies consummate a smart contract, the software code that describes the terms of the contract are placed (instantiated) onto, for example, the Ethereum blockchain. The goal of a smart contract is to automate the compliance of the terms as much as possible, and not to rely on human interaction or intervention. To that end, reliance is placed on electronic devices that are often part of the "Internet of Things" ("IoS"), which are capable of conducting transactions on the same blockchain as the smart contract. For example, an automaker could contract for 500,000 spark plugs from a vendor through a smart contract in Ethereum. The code for the smart contract may expect a signal from an IoT device when an individual spark plug leaves the factory, and trigger a micro-payment to the spark plug manufacturer upon that event with Ether cryptocurrency. Final payment could be made upon detection (by another IoT device) of the delivered spark plug at the automaker's factory. All of the terms of the contract are reflected in the code. All remedies for problems may also be reflected in the code, which thus precludes parole evidence and (most) potential lawsuits. Contractual language can thus be commoditized and thereby reducible to rigid computer code that is known by (and testable by) both parties using an agreed-upon set of code. Workflows that define the process of the contract

---

14 Kevin Werbach, THE BLOCKCHAIN AND THE NEW ARCHITECTURE OF TRUST, (Massachusetts Institute of Technology, 2018).

15 Jake Frankenfield, *What is a Smart Contract?*, Invetopedia (October 8, 2019) https://www.investopedia.com/terms/s/smart-contracts.asp. Smart contracts were invented by Nick Szabo in 1994. *See*, Nick Szabo, *Smart Contracts: Building Blocks for Digital Markets*, (1996) https://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart_contracts_2.html

16 *Supra*, note 4.

17 *See, e.g.*, Introduction to Dapps, Ethereum Developer Documentation (January 12, 2021) https://ethereum.org/en/developers/docs/dapps/

18 For more information about open source software, *see*, https://opensource.org/

19 CodeOoze, *How to install Truffle and Ganache in Ubuntu 18.04*, CodeOoze.com (February 17, 2019) https://www.codeooze.com/blockchain/ethereum-dev-environment-2019/ Ganache is a quick and easy way to run a personal blockchain for developing and deploying smart contracts. Truffle is used to manage smart contract projects, testing, compiling and migration. *Id.*

can be defined in a domain-specific language, such as *Legalese.*[20] Software frameworks, such as Brownie,[21] exist that simplifies the process of drafting and implementing a smart contract.

5. What is a Distributed Autonomous Organization ("DAO")?[22]

"With smart contracts, a blockchain network gains the power of automated decision-making and execution."[23] "that capability can be used to create a new algorithmic organizational form: the distributed autonomous organization, or DAO."[24] Under the "nexus of contracts theory" of corporations, a company is nothing more than a set of contracts.[25] Similarly, a set of smart contracts are said to form a DAO.[26] Essentially, "[t]he standard corporate arrangements of equity, debt, and corporate governance can be encoded in a series of smart contracts based on cryptocurrencies."[27]

Examples of DAOs include DAOstack,[28] Jelurdia,[29] MakerDAO,[30] and Moloch DAO.[31] While at the moment, many DAOs are themselves devoted to the automation of DAO-creation, the Moloch DAO is devoted to funding startups that are themselves DAOs. As one might expect, this automation craze has prompted engineers to develop a framework for automating the

---

20 https://legalese.com/

21 Brownie is a Python-based development and testing framework for smart contracts targeting the Ethereum Virtual Machine. https://github.com/iamdefinitelyahuman/brownie-v2 *See also*, Saurav Verma, *Learn the Basics of Brownie*, Better Programming (January 31, 2020) https://medium.com/better-programming/part-1-brownie-smart-contracts-framework-for-ethereum-basics-5efc80205413.

22 Note, distributed autonomous organizations are also known as decentralized autonomous organizations. The names are synonymous, and both share the same acronym "DAO". For this article, I have adopted the former name.

23 Werbach, *supra* note 13 at 110.

24 *Id.*

25 *See, e.g.*, Ronald F. White, *Nexus of Contracts Theory*, http://faculty.msj.edu/whiter/nexusofcontracts.htm (this articles is taking an economist's view of the theory). *See also*, Soumik Chakroborty, *Corporation As Nexus of Contracts: A Critque*, Academike (December 17, 2014) https://www.lawctopus.com/academike/corporation-nexus-contracts-critique/ ("The nexus of contracts theory is an idea put forth by a number of economists and legal commentators which asserts that corporations are nothing more than a collection of contracts between different parties – primarily shareholders, directors, employees, suppliers, and customers"). William W. Bratton Jr., *Nexus of Contracts Corporation: A Critical Appraisal*, 74 Cornell L. Rev. 407 (1989) Available at: http://scholarship.law.cornell.edu/clr/vol74/iss3/1.

26 *See, e.g., Distributed autonomous organization*, PlatformValueNow.org (March 2, 2017) https://platformvaluenow.org/signals/distributed-autonomous-organization/ *See also*, Werbach, *supra* note 13, at 110.

27 Werbach, *supra*, note 13 at 110.

28 https://daostack.io/ DAOstack is an open source project advancing the technology and adoption of decentralized governance.

29 https://www.jelurida.com/ Jelurida is a blockchain software company that develops and maintains the Nxt and Ardor blockchains.

30 https://makerdao.com/en/ MakerDAO is owned by the Maker Foundation. The Maker Foundation is tasked with bootstrapping MakerDAO to fuel growth and drive the organization toward complete decentralization. While the Foundation provided development support through the launch of the cryptocurrency called Multi-Collateral Dai (MCD), it is currently spearheading efforts to decentralize development.

31 https://www.molochdao.com/

generation of DAOs.[32] This type of automation is expected to increase the number of DAOs, so lawyers should expect to encounter DAO-related legal questions for investors and developers alike.

"As self-executing software running on a distributed blockchain, a DAO need not have any owners in the traditional sense. It simply operates and interacts with the world according to its algorithms."[33] Thus, while a DAO may have human creators, DAOs do not require human employees (or owners), which is a novel concept (and problem) for most jurisdictions. The direction or management of the DAO is typically done in two fashions: algorithmic and AI-assisted. The two fashions are not exclusive, however. Most DAOs are actually hybrids, with some aspects of management being hard-coded in an algorithm, while others are run by AI-trained neural networks. Still other DAOs employ machine learning algorithms to respond to changes in the market. In other words, the DAO can learn "on the job," based on their own perceived experience.

While the hard-coded DAOs are eminently predictable in their behavior, their machine learning cousins are not. The predictability (or not) of DAOs has legal implications. Moreover, the risks (legal and otherwise) of DAOs, while manageable, entail the need for legal advise for investors. Consequently, lawyers need to be conversant in the technology of DAOs in order to advise their clients of the attendant legal implications. No case better illustrates this need for legal *and* technological acumen than one of the first DAOs (confusing called "*The DAO*") which resulted in the infamous Ethereum DAO attack.

"Up until it collapsed, The DAO represented the highest technological achievement – and the coming wave of innovation – that the Ethereum blockchain has enabled."[34] The DAO was the brainchild of Dan Larimer[35] and Vitalik Buterin,[36] the latter being a Russian-Canadian programmer and co-founder of the Ethereum blockchain. The DAO was a crowdfunding service implemented on the Ethereum blockchain.

> "The DAO, which got that name for being the first encoded version of the concept, was the proving ground that the disruptive world of venture capitalism could itself be disrupted. Approximately $150 million in ether was contributed to the project, and more than 50 projects were teed up to possibly be funded by a smart contract that no one person owned."[37]

Once created, The DAO was attacked. Hackers detected a vulnerability in the code making up The DAO, and exploited it. They got away with millions of dollars in cryptocurrency. Worse, copycats appeared and even more cryptocurrency was lost. "Investors withdrew their funds, a 'dark DAO' was spun up to protect the remaining and a serious debate raged over when it might

---

32 *See, e.g.,* LL-DAO, https://github.com/dOrgTech/LL-DAO

33 Werbach, *supra*, note 13 at 110.

34 Daniel Kuhn, *Did Ethereum Learn Anything From the $55M DAO Attack?*, Coindesk (September 20, 2020) https://www.coindesk.com/ethereum-learn-dao-attack

35 *See, e.g.,* Dan Larimer, Steem.Center https://www.steem.center/index.php?title=Dan_Larimer

36 *See, e.g.,* Vitalik Buterin, Wikipedia, https://en.wikipedia.org/wiki/Vitalik_Buterin

37 Kuhn, *supra*, note 33.

be appropriate to hard fork or roll back events on a blockchain."[38] In the aftermath, market exuberance and lack of attention to security were blamed for the fiasco. For the developer community, it was a hard lesson. Fortunately, the security issues were surmountable, so the overall assessment of the technology remained buoyant. For the investment community, The DAO debacle was an expensive lesson, and demonstrated the need to limit risk while the developers sorted out the details.

6. Business Organizations for Blockchain-Oriented Companies

Several states (such as Delaware[39]) expressly allow the use of blockchains for corporate functions within a standard corporation. However, entrepreneurs determined that a specialized business entity was needed to facilitate the development and implementation of DAOs. That need is particularly acute because DAOs can be fitted with artificial intelligence ("AI") that can – without human interaction – modify the DAOs business model, or develop other business models and pursue different business goals than were first envisioned by its human creators.[40] Because the developers and owners of the DAO cannot predict what the DAO's AI will do, they understandably wish to limit their liability while still be able to profit from the DAO.

In 2018, Vermont became was the first state to enact a specific business organization type in 2018, namely a blockchain-based L.L.C.[41] Another state, Wyoming,[42] is following Vermont's lead and has pending legislation tailored to companies making heavy (if not exclusive) use of blockchains. Note, neither the Vermont law, or the Wyoming bill requires that the BBLLC be for a DAO. The corporate form merely requires that a blockchain make up some particular aspect of the company. It just so happens that a DAO can fit within the rubric of the Vermont law (and the Wyoming bill).

---

38 *Id.*

39 *See, e.g.*, Wonnie Song, *Bullish On Blockchain: Examining Delaware's Approach To Distributed Ledger Technology In Corporate Governance Law And Beyond*, Harvard Bus. L. Rev., (2017) Online at: https://www.hblr.org//wp-content/uploads/sites/18/2018/01/Bullish-on-Blockchain-Examining-Delaware%E2%80%99s-Approach-to-Distributed-Ledger-Technology-in-Corporate-Governance-Law-and-Beyond.pdf

40 *See, e.g.*, Prashant Ram, *The implications of AI on the Blockchain*, Hackernoon (July 24, 2018) https://hackernoon.com/the-distributed-autonomous-organization-dao-and-how-blockchain-ai-can-take-over-the-network-17a51f099d0f *But see*, Werbach, *supra*, note 13 at 110 ("Trusting an AI-trained system, therefore, adds another degree of risk over trusting a system based on hard-coded algorithms."). *See also*, Alexandre Gonfalonieri, *Why Building an AI Decentralized Autonomous Organization (AI DAO): Why most traditional business organizations are in danger (Business models, AI agents, etc.*, Towards Data Science (June 29, 2020) https://towardsdatascience.com/why-building-an-ai-decentralized-autonomous-organization-ai-dao-85d018700e1a; Trent McConaghy, *Artificial Intelligence (AI) DAOs (decentralized autonomous organizations)* BigchainDB (April 19, 2017) https://www.slideshare.net/BigchainDB/artificial-intelligence-ai-daos-decentralised-autonomous-organisations-bigchaindb-ipdb-meetup-4-april-05-2017; SimoneSays, *How to Create the Future of Decentralized Autonomous Organizations* SingularityNET (December 1, 2017) https://blog.singularitynet.io/how-to-create-the-future-of-decentralized-autonomous-organizations-7919d4e5ce36; and S. Ponomarev and A.E. Voronkov, *Multi-Agent systems and decentralized artificial superintelligence*, Arxiv.org, https://arxiv.org/ftp/arxiv/papers/1702/1702.08529.pdf

41 *See* 11 V.S.A. § 4173.

42 *See*, Wyoming Senate Bill 38 (2021) https://wyoleg.gov/Legislation/2021/SF0038

7. Example: Vermont's BBLLC Statute

Vermont's blockchain-based limited liability corporation ("BBLLC") statute is under Title 11, §§ 4171-4176.[43] Essentially, the BBLLC is just a regular LLC with some added requirements that are peculiar to DAOs. The statutes states that the "BBLLC may provide for its governance, in whole or in part, through blockchain technology."[44] In Vermont, the company must specify, in its articles of incorporation, that it has elected to be a BBLLC,[45] and subsection (2) of § 4173 includes six other requirements:

(A) provide a summary description of the mission or purpose of the BBLLC;[46]

(B) specify whether the underlying blockchain "will be fully decentralized or partially decentralized" and whether the blockchain "will be fully or partially public or private, including the extent of participants' access to information and read and write permissions with respect to protocols;"[47]

(C) "adopt voting procedures, which may include smart contracts" that are implemented on the blockchain to address forking,[48] changes to the operating agreement of the BBLLC,[49] and "any other matter of governance or activities within the purpose of the BBLLC;"[50]

(D) adopt protocols to respond to system security breaches or other unauthorized actions that affect the integrity of the blockchain technology utilized by the BBLLC;[51]

(E) provide how a person becomes a member of the BBLLC with an interest, which may be denominated in the form of units, shares of capital stock, or other forms of ownership or profit interests;[52] and

(F) specify the rights and obligations of each group of participants within the BBLLC, including which participants shall be entitled to the rights and obligations of members and managers.[53]

The Vermont statute makes special mention of *members* and *managers*. However, those terms don't have any special meaning within the ambit of the BBLLC statute, and thus have the same meaning as for other LLCs. § 4174 expressly states that members and managers can have multiple roles within the BBLLC, "including as a member, manager, developer, node, miner, or other participant in the BBLLC, or as a trader and holder of the currency in its own account and

43 11 V.S.A. § 4171 *et. seq.*
44 11 V.S.A. § 4173(1).
45 11 V.S.A. § 4172.
46 11 V.S.A. § 4173(1)(A).
47 11 V.S.A. § 4173(1)(B).
48 11 V.S.A. § 4173(1)(C)(i).
49 11 V.S.A. § 4173(1)(C)(ii).
50 11 V.S.A. § 4173(1)(C)(iii).
51 11 V.S.A. § 4173(1)(D).
52 11 V.S.A. § 4173(1)(E).
53 11 V.S.A. § 4173(1)(F).

for the account of others, provided such member or manager complies with any applicable fiduciary duties."[54] This remains true regardless of the location of that person.[55]

Finally, the Vermont BBLLC law has a very important provision regarding the technological structure of the company. § 4175 requires that, in the governance of the corporation, the company must "adopt any reasonable algorithmic means for accomplishing the consensus process for validating records, as well as requirements, processes, and procedures for conducting operations, or making organizational decisions on the blockchain technology used by the BBLLC."[56]

Clearly the authors of the Vermont BBLLC law were concerned, for investor's sake, about the design of the blockchain, as reflected in subsections (B), (C) and (D). It should be noted, however, that Vermont law did not directly affect the potential of AI morphing the operation of the DAO. However, Vermont made a very clever caveat provision that should apply in situations with AI-in-command, namely § 4175(2), which requires "in accordance with any procedure specified pursuant to section 4173 of this title, modify the consensus process, requirements, processes, and procedures, or substitute a new consensus process, requirements, processes, or procedures that comply with the requirements of law and the governance provisions of the BBLLC."[57] In other words, if the AI (or humans) morph the company's business model and/or governance model, an amendment to the articles of incorporation is required. In any case, lawyers who are going to advise clients as to *how* to characterize the blockchain and operation, as required in subsections (B), (C) and (D) of § 4173 will need to be versed in the technology.

Wyoming's proposed legislation, SF 38,[58] differs from Vermont's law. Under SF 38, the company is an LLC that elects a "status" as a "decentralized autonomous organization." Unlike Vermont, a Wyoming company that is already an LLC could (under the proposed legislation) "convert" to claim DAO status by amending its articles of organization to include the required language.[59] Interestingly, SF 38 requires that the status of the DAO be included within the name of the company in one of three ways: "DAO", "LAO", or "DAO LLC."[60] Another important requirement in SF 38 is that a DAO must, within the articles of incorporation, define the company as *either* a member managed DAO, or an algorithmically manage DAO (and the member managed selection is the default).[61]

There are some additional requirements under Wyoming SF 38, namely the requirement that "the articles of organization shall include a publicly available identifier of any smart contract directly used to manage, facilitate or operate the decentralized autonomous organization."[62] How that would work in practice is an open question. As alluded to with the Vermont law, the Wyoming legislation would require amendment of the articles of incorporation if the DAO's

54 11 V.S.A. § 4174(a).
55 11 V.S.A. § 4174(b).
56 11 V.S.A. § 4175(1).
57 11 V.S.A. § 4175(2).
58 Wyoming Senate File 0038, which is available at: https://wyoleg.gov/Legislation/2021/SF0038.
59 *Id.*
60 *Id.*
61 *Id.*
62 *Id.*

smart contracts are "updated or changed."[63] Presumably, that change could be accomplished by a human, or by AI-enhanced code, although the proposed legislation was silent as to that issue.

8. Conclusion

Distributed autonomous organizations exist, and are here to stay. Their profit potential is obvious and substantial, particularly because smart contracts and DAOs can reduce transaction costs. However, DAOs are not without risk, and the need to limit liability is necessary for the potential of DAOs to be realized. States are beginning to tailor specialized business entities that address the particular concerns of DAOs. While the technology and business models for DAOs are evolving rapidly, the statutory schemes are also going to change, albeit at a slower and delayed pace than the technology. Even so, some companies are taking advantage of particularized corporate forms, and other states will likely follow Vermont's lead in order for those states to remain competitive.

63 *Id.*