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LEARNING HOW TO TALK LIKE A BLOCKCHAIN GEEK: BLOCKCHAIN CORPORATE RECORDS ARE COMING YOUR WAY SOON

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This article discusses ways that blockchain technology is likely to impact corporations and their lawyers and explains how to understand your client's IT people as they explain how they use blockchain technology. It also provides some basic background on Blockchain functionality, terminology and regulation.

To set the stage for why Blockchain is in your future let's look at this definition of Blockchain:

A blockchain is a **golden record of the truth** that **creates trust** among multiple parties.

Specifically, it's a secure, **tamper-proof** ledger with **time-stamped transactions**, distributed amongst a number of entities.

That's a dream come true for the legal profession these days when it's easy to change and manipulate most digital records because with blockchain, records can be:

- tamper proof
- time-stamped
- stronger evidence (record of truth)
- create trust

Near-term applications for blockchain technology that will soon be affecting corporate lawyers are:

- Shareholder voting
- Stock transfers

Question: What do both of these applications have in common?

Answer: Current practices are inefficient and expensive

I. SHAREHOLDER VOTING

The first tests of blockchain technology for shareholder voting are already underway.

Blockchain is the next logical election technology, because it decentralizes data and easily identifies when data has been changed. Broadridge, which counts votes for public company shareholder meetings, tested a blockchain voting system in March 2018. American and international stock exchanges have been experimenting with blockchain stockholder voting to replace inefficient proxy systems.

II. DELAWARE CORPORATE RECORDS

Delaware created a legal framework for broad use of blockchain technology by corporate America when it amended the Delaware General Corporation Law (“DGCL”) was amended in 2017 to authorize using “electronic networks and databases” for records that state law requires corporations to maintain.

Section 219 of the DGCL specifically covers stockholder lists. Section 219 (c) defines what a stock ledger is, but Section 219 does not use the term “stock ledger.”

For purposes of this chapter, “stock ledger” means one or more records administered by or on behalf of the corporation **in which the names of all of the corporation’s stockholders of record, the address and number of shares registered in the name of each such stockholder,** and all issuances and transfers of stock of the corporation are recorded in accordance with § 224 of this title. The stock ledger shall be the only evidence as to who are the stockholders entitled by this section to examine the list required by this section or to vote in person or by proxy at any meeting of stockholders.

The DGCL requires four types of information to be in a stock ledger:

- Stockholder name
- Stockholder address
- Number of shares registered under each name
- All issuances and transfers

In assessing whether blockchain is suitable for use as a “stock ledger,” it should be noted that the DGCL does not specifically require a physical mailing address and does not require the corporation to record only legal names in birth certificates. Corporations rarely inquire as to the legal status of names and often use email and other types of addresses that stockholders give them.

Corporations should, however, consider the impact of anti-money laundering, anti-terrorist and anti-privacy laws on the information they collect about stockholders in original issuances and stock transfers.

So, what does a corporation do if a record owner only provides a blockchain address?

No law requires any person to have a physical mailing address. Therefore, people can choose their addresses, which can be electronic or not. Likewise, people change addresses and are not required to inform corporations in which they own stock of address changes. Many stockholders are unreachable.

Tax and other laws may require businesses to report information to the IRS and other agencies. Names are associated with social security, EIN and other tax ID numbers for reporting tax information, but the DGCL does not require such tax ID information to be in the “stock ledger.”

Securities laws (such as those relating to bad actors, accredited investors and beneficial ownership) may affect decisions about what information corporations should require

stockholders to provide, but such information is not required to be included in the stock transfer ledger.

Note that the requirements for a stockholder ledger are different from a stockholder list (the stockholder list is not required to include all issuances and transfers. Section 219 (a) of the DGCL provides that:

The corporation shall prepare, at least 10 days before every meeting of stockholders, a complete list of the stockholders entitled to vote at the meeting; provided, however, if the record date for determining the stockholders entitled to vote is less than 10 days before the meeting date, **the list shall reflect the stockholders entitled to vote as of the tenth day before the meeting date, arranged in alphabetical order, and showing the address of each stockholder and the number of shares registered in the name of each stockholder. Nothing contained in this section shall require the corporation to include electronic mail addresses or other electronic contact information on such list.**

“Stock ledgers” are part of the “books and records” of a corporation. Section 220 of the DGCL gives stockholders limited rights to inspect corporate books and records and specifically includes “the corporation’s stock ledger, a list of stockholders and other books and records.”

Section 224 of the DGCL that governs the form of corporate records does not require corporations to maintain paper records, but it does require that records kept in electronic form be kept so that they “can be converted into clearly legible paper form within a reasonable time.”¹

What other information is required by the DGCL to be in the corporate records?

Section 224 of the DGCL provides that records kept in electronic form must be kept so that they:

(i) can be used to prepare the list of stockholders specified in §§ 219 and 220 of this title, (ii) record the information specified in §§ 156,² 159,³ 217(a)⁴ and 218 of

¹ Section 224 of the DGCL: “Any records administered by or on behalf of the corporation in the regular course of its business, including its stock ledger, books of account, and minute books, may be kept on, or by means of, or be in the form of, any information storage device, method, or 1 or more electronic networks or databases (including 1 or more distributed electronic networks or databases), provided that the records so kept can be converted into clearly legible paper form within a reasonable time, and, with respect to the stock ledger, that the records so kept (i) can be used to prepare the list of stockholders specified in §§ 219 and 220 of this title, (ii) record the information specified in §§ 156, 159, 217(a) and 218 of this title, and (iii) record transfers of stock as governed by Article 8 of subtitle I of Title 6. Any corporation shall convert any records so kept into clearly legible paper form upon the request of any person entitled to inspect such records pursuant to any provision of this chapter. When records are kept in such manner, a clearly legible paper form prepared from or by means of the information storage device, method, or 1 or more electronic networks or databases (including 1 or more distributed electronic networks or databases) shall be valid and admissible in evidence, and accepted for all other purposes, to the same extent as an original paper record of the same information would have been, provided the paper form accurately portrays the record.”

² Section 156 of the DGCL governs partly paid shares.

³ Section 159 of the DGCL governs transfer rules for when shares are transferred as collateral security.

⁴ Section 217(a) of the DGCL governs stock held by fiduciaries.

this title, and (iii) record transfers of stock as governed by Article 8 of subtitle I of Title 6.⁵

Other provisions of the DGCL that permit notices to be delivered in electronic form will enable corporations to communicate with their stockholders through blockchain addresses. These include: notices of preferences and special rights for stock certificates,⁶ stock transfer restriction notices,⁷ electronic notices,⁸ and notices regarding “public benefit” status.⁹

The bottom line is that blockchain stock transfer records can, if thoughtfully implemented, satisfy the requirements of the DGCL.

Blockchain is a relatively new technology. Corporations may find that they need to customize blockchain software to make it suitable for stock transfer ledger purposes. For example, corporations may want to make it easier to locate and convert into paper form the information required to satisfy the paper and inspection requirements of DGCL.

This raises the question of what type of blockchain should corporations use for stock transfer ledger purposes. Other blockchain solutions may emerge over time, but the Ethereum Network¹⁰

⁵ Article 8 of subtitle I of Title 6 of the Delaware Code governs security interests in stock and other financial assets.

⁶ Section 151 (f): “Within a reasonable time after the issuance or transfer of uncertificated stock, the registered owner thereof shall be given a notice, in writing or by electronic transmission, containing the information required to be set forth or stated on certificates pursuant to this section or § 156, § 202(a), § 218(a) or § 364 of this title or with respect to this section a statement that the corporation will furnish without charge to each stockholder who so requests the powers, designations, preferences and relative participating, optional or other special rights of each class of stock or series thereof and the qualifications, limitations or restrictions of such preferences and/or rights.”

⁷ Section 202 (a) of the DGCL states : “A written restriction or restrictions on the transfer or registration of transfer of a security of a corporation, or on the amount of the corporation’s securities that may be owned by any person or group of persons, if permitted by this section and noted conspicuously on the certificate or certificates representing the security or securities so restricted or, in the case of uncertificated shares, contained in the notice or notices given pursuant to § 151(f) of this title, may be enforced against the holder of the restricted security or securities or any successor or transferee of the holder including an executor, administrator, trustee, guardian or other fiduciary entrusted with like responsibility for the person or estate of the holder. Unless noted conspicuously on the certificate or certificates representing the security or securities so restricted or, in the case of uncertificated shares, contained in the notice or notices given pursuant to § 151(f) of this title, a restriction, even though permitted by this section, is ineffective except against a person with actual knowledge of the restriction.”

⁸ Section 232 (c) of the DGCL states: “For purposes of this chapter, “electronic transmission” means any form of communication, not directly involving the physical transmission of paper, including the use of, or participation in, 1 or more electronic networks or databases (including 1 or more distributed electronic networks or databases), that creates a record that may be retained, retrieved and reviewed by a recipient thereof, and that may be directly reproduced in paper form by such a recipient through an automated process.”

⁹ Section 364 of the DGCL provides: “Any stock certificate issued by a public benefit corporation shall note conspicuously that the corporation is a public benefit corporation formed pursuant to this subchapter. Any notice given by a public benefit corporation pursuant to § 151(f) of this title shall state conspicuously that the corporation is a public benefit corporation formed pursuant to this subchapter.”

¹⁰ The Ethereum Network is a distributed public blockchain network (similar to Bitcoin). According to its website (located at www.ethereum.org), the network “is a decentralized platform that runs smart contracts: applications that run exactly as programmed without any possibility of downtime, censorship, fraud or third-party interference. These apps run on a custom built blockchain, an enormously powerful shared global infrastructure that can move value around and represent the ownership of property. This enables developers to create markets, store registries of debts or promises, move funds in accordance with instructions given long in the past (like a will or a futures contract) and many other things that have not been invented yet, all without a middleman or counterparty risk. The project was bootstrapped via an ether presale in August 2014 by fans all around the world. It is developed by the Ethereum Foundation, a Swiss non-profit, with contributions from great minds across the globe.”

is a good candidate, because the Ethereum Network accommodates “Smart Contracts”¹¹ that permit corporations to decide what data to collect and who has access to the information.

Of course, there are several important differences between traditional stock transfer records and using the blockchain:

- Blockchain enables sellers to make it known that they want to sell, how many shares they want to sell and the price they are willing to sell at and buyers to make it known that they want to buy, the number of shares they want to buy and the price they want to pay.
- Blockchain facilitates direct communications between potential sellers and buyers.
- Blockchain actually powers the transaction between buyers and sellers instead of passively recording it after the fact.

All of these blockchain capabilities raise securities law issues for corporations intending to use blockchain for their stock transfer ledgers, including compliance with:

- Offering rules for original issuances by issuers
- Stock transfer restrictions following issuances of unregistered securities
- Section 12 (g) of the Securities Exchange Act of 1934
- Broker-dealer issues and
- Rules related to securities trading exchanges.

Unless corporations understand rules for stock transfers and include in their software functions that assure compliance, they risk violating numerous securities laws. Smart Contracts are a vehicle for establishing these rules.

III. TALK THE BLOCKCHAIN TALK

Now that we understand some of the blockchain applications that that are most likely to impact corporate lawyers, let's learn the basic terminology and a little bit about how Blockchains work.

What is a Blockchain?

A blockchain is a distributed ledger or record of events or transactions kept by software.

It has four primary attributes:

1. **Distributed** on a peer-to-peer (“P2P”) network of computers
2. Stores information in a distributed **Ledger** or Database
3. Works by **Consensus** to make decisions and verify information
4. Blocks linked and secured by **Encryption**

¹¹ According to Wikipedia, a smart contract is a “computer protocol intended to digitally facilitate, verify, or enforce the negotiation or performance of a contract. Smart contracts allow the performance of credible transactions without third parties. These transactions are trackable and irreversible.”

What Does That Mean?

Distributed computing architecture – this means data is stored in many computers (a **Node**) instead of a single location. Every computing Node executes and records the same transactions to **reach agreement** (Consensus) about shared data that belongs on a **decentralized ledger**.

How does a blockchain store transaction data?

Transactions are grouped into **blocks**. When the computing Nodes agree that the block is accurate, the block is added to a chain of blocks. Only one block can be added at a time.

After a block of information has been approved by a majority of the Nodes, the data in the block cannot be removed or changed without the entire network knowing

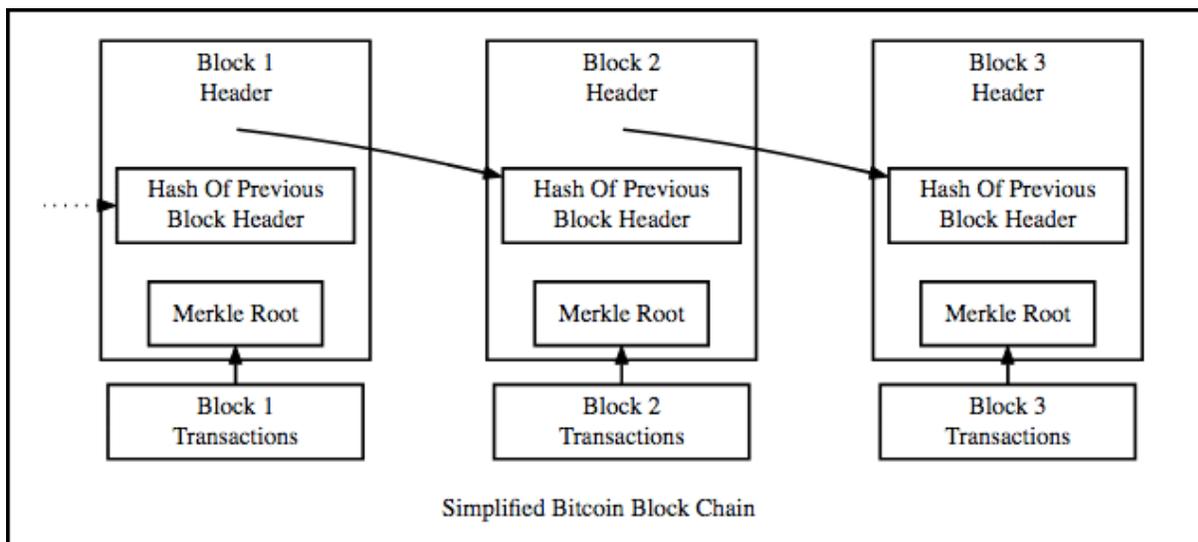
Secrecy vs Transparency

Data is encrypted, but the primary security is that transactions cannot be changed by hackers without it being readily apparent that an unauthorized change has occurred.

Blockchains can be open to anyone in a public blockchain (like Bitcoin) or private (like a private trading market).

How Blockchains Are Linked

The following graphic¹² illustrates how blocks are linked within a blockchain.



Vocabulary: Learn To Speak Blockchain (Key Technical Terms)

This list provides definitions of some key technical terms applicable to blockchain technology:

- Blockchain – a linked list containing data
- Blocks –bundles of data (often transactions)

¹² <https://bitcoinstackexchange.com>

- Block Header – Address of each Block
- Hash – a string of letters and numbers that is always the same length (256 for Bitcoin) that represent a much larger amount of data
- Hashing- creating a Hash using a hashing algorithm that assigns a unique Hash to each different set of data – Hashes are usually stored in the Blocks instead of the original data – Exactly the same data always produces exactly the same Hash – Even small differences in data produces a very different Hash – you verify that data is the same by comparing the Hashes
- Hash Pointer – contains a Hash of the previous Block (the Hash Pointer is the chain that links the Blocks)
- Merkle Root – contained in the Block Header that is derived from hashing all the Hashes of all transactions in the Block (enable you to verify all the transactions in the Block by downloading just the Block Headers that contain the Merkle Root)s
- Nodes – servers that maintain a copy of the complete blockchain – Nodes often verify transactions
- Consensus – calculations validate, authenticate and keep track of transactions in a Block
- Proof of Work (PoW) – a consensus calculation that uses Hashes to solve math equations - the Node that solves the equation shares it with other Nodes that then verify the solution is correct
- Proof of Stake (PoS) – an algorithm that uses digital signatures to verify ownership or "stake" (i.e. confirms someone has sufficient tokens to purchase goods or services) and then assigns a Node to work to verify new transactions and create a new Block
- Cryptocurrency, Coins, Token or Digital Asset – the unit or medium of exchange used to store data. Corporations that embrace regulation of the Digital Asset as a “security” in the U.S., may issue Digital Assets to investors as “tokenized securities”.

How are tokens and coins related to Blockchain?

If you think of the Internet as a big vending machine, tokens are the coins you use to buy things. Blockchain powers the vending machine.

Coins store value like any currency. Coins, Tokens, Cryptocurrency and Digital Assets all represent different types of units that are storing value or information in the blockchain.

What about Digital Wallets?

Digital wallets hold and transfer coins and tokens. Digital wallets have three main components:

1. **Private Key** -- A long series of numbers and letters that enables the owner of the wallet to activate the wallet's public address. You cannot send Coins or other Digital Assets from the public address on the blockchain, unless you can activate the wallet's public address.

2. **Public Key** -- Each private key is assigned a corresponding public key. The public key is a "hashed" version of your private key. The algorithm makes it very easy to generate public keys from private keys, but it is very difficult to "reverse" the algorithm to accomplish the opposite. The public key is "hashed." Hashing then produces the public address. Sending someone your public address also sends them your public key (but not your private key). This is analogous to using code to protect the secrecy of your private key.
3. **Public Address** – The "address" of the wallet that is published in the Blockchain. Addresses are very long strings of numbers that are translated by software into shorter numbers of letters and numbers. For Bitcoins, the public address changes each time a transfer is made.

Wallets: How do private keys, public keys and addresses work together?

The following graphic¹³ illustrates how these three components function together”



What is a Smart Contract?

A Smart Contract is a software program that consists of one or more "If X, then Y" comments. Once the program verifies that X has occurred, the program automatically causes Y to occur.

For example, the contract could say: When the seller delivers a title document to the buyer or to a third party escrow agent, the payment will be made. In some instances, the buyer may need to agree that the title is in good order. In other instances, the blockchain could create a "hash" of the title document. Transfer could occur when the seller delivers a document that creates exactly the same hash.

Self-executing smart contracts that facilitate automatic transfers can change how businesses use lawyers and courts. Instead of a seller having to sue the buyer to get paid, the buyer who is dissatisfied with the goods delivered would sue the seller for a refund

Regulation Alert!

It is important to recognize that the regulatory treatment of Coins, Tokens and Digital Assets remain uncertain in the U.S. and abroad. With the increased popularity of "Initial Coin

¹³ <https://wetrust.io>

Offerings” (or ICOs) in 2016-2017, several countries (like China) have banned the use of cryptocurrencies while others continue to struggle with how to characterize (and regulate) these digital assets. In the U.S., we see a struggle between classification as a “currency” (which implicates MSB regulations under FinCEN and imposes related AML/KYC rules), vs. classification as a “security” (which implies SEC and state blue-sky regulation of the initial sale and secondary transfers of the digital asset). We see complex and uncertain tax treatment of these digital assets – per the IRS cryptocurrency such as Bitcoin is taxed as property, but it is uncertain how “tokenized securities” will be treated by the IRS. The CFTC also joins the regulation race, as it also classifies cryptocurrencies as commodities.

A detailed discussion of these issues is beyond the scope of this article – but suffice it to say that how the Digital Asset is regulated in the U.S. will continue to be a “facts and circumstance test” for quite some time, as the world continues to embrace and learn about the wonders of Blockchain technology.