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"ESTONIA'S GIFT TO THE WORLD": THE IMPLEMENTATION OF A BLOCKCHAIN PROTOCOL FOR CORPORATE GOVERNANCE IN NEW YORK

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ABSTRACT

The traditional procedures of corporate governance are not designed to resolve issues related to close outcomes of corporate votes, empty voting practices, the proxy voting protocol, verification of shareholder identities, and access to corporate records. Blockchain technology allows all corporate shareholders to participate in corporate governance more conveniently, with increased transparency, on a secure network. Estonia sought to revolutionize corporate governance by facilitating the development of a blockchain based e-voting protocol for shareholders of companies listed on the Tallinn Stock Exchange to vote in shareholder meetings. After unsuccessful attempts, New York stands well behind other states, such as Delaware, in positioning itself as a regulatory leader to allow blockchain enabled procedures to disrupt corporate governance. This Note considers how the Estonian model of e-Residency, or "Estonia's gift to the world," can be adapted to a New York market to enhance shareholder engagement and re-incentivize innovation-driven entities to incorporate in New York.

INTRODUCTION

After more than fifty years of Soviet occupation, Estonia declared its independence from the Soviet Union in 1991, thus restoring its namesake as the Republic of Estonia.[1] This transition came with the challenge of establishing an economic infrastructure from scratch.[2] Estonian leaders saw this new beginning as an opportunity to become "the world's premier 'digital nation,'"[3] especially by means of bolstering technology for governance and public utilities purposes.

Over the past twenty years, Estonia has made strides to afford its citizens democratic autonomy through technological advances. In 1997, 97% of Estonian schools had access to the Internet.[4] By 2000, Estonian cabinet meetings operated completely paperless.[5] In 2002, the Estonian government

1. *The Road to Independence*, ESTONICA, http://www.estonica.org/en/History/1985-1991_Restoration_of_independence/The_road_to_independence/ (last visited Feb. 13, 2020).

2. April Rinne, *One of Estonia's First "e-residents" Explains What It Means to Have Digital Citizenship*, QUARTZ (Apr. 1, 2018), https://qz.com/work/1241833/one-of-estonias-first-e-residents-explains-what-it-means-to-have-digital-citizenship/.

3. *Id.*

4. Ben Hammersley, *Concerned about Brexit? Why not become an e-resident of Estonia*, WIRED (Mar. 27, 2017), https://www.wired.co.uk/article/estonia-e-resident.

5. Estonia's "paperless" e-Cabinet system reduces the average length of weekly cabinet meetings from four to five hours to thirty to ninety minutes. It also eliminates the need for paper

subsidized a WiFi network that granted most of Estonia's populated areas access to the Internet.[6] The following year, in 2003, Skype, a telecommunications software, was launched in Tallinn, Estonia's capital, "usher[ing] in a communications revolution."[7] By 2007, electronic voting was introduced.[8] Finally, by 2012, fiber-optic cabling was laid across the nation, which provided access to high speed data connections—and 94% of residents filed tax returns online.[9]

These great technological innovations came with the challenge of keeping Estonia's digital infrastructure secure.[10] On April 27, 2007, Estonia suffered a national cyber-breach on its servers;[11] the first country to experience a nationwide cyber-attack.[12] While no data was compromised, Estonian governmental, financial, and media web services were inundated by web traffic from multiple sources rendering online services inaccessible.[13] In response, Estonian technology leaders sought to develop a secure framework that would continue to ensure Estonia's position as a global leader in digital governance.[14]

Seven years after the cyber-attack, in 2014, Estonia secured its place as "The Digital Republic" by establishing arguably its most celebrated achievement, e-Estonia, a governmental program that allows all bureaucratic processes to be completed online.[15] The e-Estonia platform is a portal that grants Estonian's complete control over their personal data.[16] E-Estonia has digitized almost all of the nation's public services and made them accessible online by providing every citizen and resident with secure digital identities.[17] All personal data related to governmental services, including "legislation,

documents to be printed and delivered. *See e-governance*, E-ESTONIA, https://e-estonia.com/solutions/e-governance/e-cabinet/ (last visited Feb. 13, 2020); *see also* Hammersley, *supra* note 4.

6. Hammersley, *supra* note 4.

7. Isabelle de Pommereau, *Skype's Journey From Tiny Estonian Start-up to $8.5 Billion Microsoft Buy*, THE CHRISTIAN SCIENCE MONITOR (May 11, 2011), https://www.csmonitor.com/World/Europe/2011/0511/Skype-s-journey-from-tiny-Estonian-start-up-to-8.5-billion-Microsoft-buy.

8. Hammersley, *supra* note 4.

9. *Id.*

10. *See* Kaspar Korjus, *Welcome to the Blockchain Nation*, MEDIUM (July 7, 2017), https://medium.com/e-residency-blog/welcome-to-the-blockchain-nation-5d9b46c06fd4.

11. Damien McGuinness, *How A Cyber Attack Transformed Estonia*, BBC NEWS (Apr. 27, 2017), https://www.bbc.com/news/39655415.

12. Korjus, *supra* note 10.

13. *Id.* This is known as a Distributed Denial of Service (DDoS) attack. Emily Tamkin, *10 Years After the Landmark Attack on Estonia, Is the World Better Prepared for Cyber Threats?*, FOREIGN POLICY (Apr. 27, 2017), https://foreignpolicy.com/2017/04/27/10-years-after-the-landmark-attack-on-estonia-is-the-world-better-prepared-for-cyber-threats/.

14. *See We have Built A Digital Society and We Can Show You How*, E-ESTONIA, https://e-estonia.com; Korjus, *supra* note 10.

15. Nathan Heller, *Estonia, The Digital Republic*, NEW YORKER (Dec. 18, 2018), https://www.newyorker.com/magazine/2017/12/18/estonia-the-digital-republic.

16. Korjus, *supra* note 10.

17. *See id.*

voting, education, justice, health care, banking, taxes, [and] policing" are accessible on the e-Estonia platform and kept secure using the government's decentralized, encrypted data platform, X-Road.[18] The portal was designed using advanced encryption technology, a two-factor authentication system, and distributed ledger technology, in this case, blockchain technology, to bolster cybersecurity measures and ensure that data remains decentralized and not duplicated.[19]

The e-Estonia protocol is *not* designated exclusively for Estonian residents. The e-Residency program was created to permit anyone in the world to become a digital resident of Estonia.[20] E-Residency is globally accessible; it allows digital entrepreneurs to obtain secure, governmental identities to create and manage businesses entirely online.[21] Kaspar Korjus, the Managing Director of e-Residency, described the protocol as "Estonia's gift to the world."[22] In order to gain e-Residency, an extra-territorial resident must apply online and complete a series of background checks by the Estonian Police and Border Guard.[23] If approved, the e-Resident is issued an e-Residency kit, which includes an e-Resident ID card, a card reader that connects to a computer's USB portal, and pin codes for authenticating digital signatures.[24] As an e-Resident, global citizens may remotely manage a business's finances,[25] conduct electronic banking, gain access to international payment service providers, digitally sign documents and contracts, and declare taxes.[26] Additionally, global Estonian e-Residents are granted access to European markets and can maintain their business more affordably.[27]

In 2016, Nasdaq partnered with Estonia to develop a blockchain based e-voting system to permit shareholders of companies listed on the Tallinn Stock Exchange to vote in shareholder meetings, hereinafter referred to as the Estonian/Nasdaq blockchain initiative.[28] As a part of the larger Estonian e-

18. Nathan Heller, *Estonia, The Digital Republic*, NEW YORKER (Dec. 18, 2018), https://www.newyorker.com/magazine/2017/12/18/estonia-the-digital-republic.

19. Korjus, *supra* note 10.

20. Press Release, Nasdaq, Nasdaq's Blockchain Technology to Transform the Republic of Estonia's E-Residency Shareholder Participation (Feb. 12, 2016), http://ir.nasdaq.com/news-releases/news-release-details/nasdaqs-blockchain-technology-transform-republic-estonias-e.

21. *Make Estonia the New Digital Home for Your Online Business with e-Residency*, REPUBLIC OF ESTONIA, E-RESIDENCY, https://e-resident.gov.ee (last visited Feb. 28, 2020).

22. Korjus, *supra* note 10.

23. *Id.*

24. *Id.*

25. *Make Estonia the New Digital Home for Your Online Business with e-Residency*, *supra* note 21.

26. Press Release, Nasdaq, *supra* note 20.

27. *Make Estonia the New Digital Home for Your Online Business with e-Residency*, *supra* note 21.

28. *Is Blockchain the Answer to E-voting? Nasdaq Believes So*, NASDAQ MKT. INSIGHT (Jan. 23, 2017), https://business.nasdaq.com/marketinsite/2017/Is-Blockchain-the-Answer-to-E-voting-Nasdaq-Believes-So.html. Nasdaq's former Co-President, Hans-Ole Jochumsen, acknowledged that Estonia's small, uncomplex structure and success in integrating technology for public use made it

Residency platform, the Estonian/Nasdaq blockchain initiative allows Estonian e-Residents and stakeholders of Estonian corporations to participate in corporate governance more conveniently, on a secure network.[29] Additionally, under the e-Residency program, shareholder identities can be authenticated with ease.[30] Paired with Nasdaq's blockchain protocol, shareholder votes are swiftly recorded, thereby improving shareholder engagement and streamlining the proxy voting process.[31] Shareholders who use the protocol are able to:

> [v]iew information about meetings and vote before or during the meeting; [u]se the system to transfer their voting rights to a proxy; [m]onitor how the proxy voted on their behalf; and if needed, recall the proxy; and [r]eview previous meetings and transactions based on the indelible record the system creates.[32]

Additionally, custodian holders[33] are given the ability to vote for their clients or distribute voting rights to owners quickly via a simple file upload.[34] Typically, annual general meetings are expensive and do not encourage active shareholder participation.[35] In response, the Estonian/Nasdaq blockchain initiative has sought to revolutionize corporate governance.[36]

Classic shareholder proxy elections have been conducted the same way for decades, with little affordances to innovative technical solutions.[37] Historically, the proxy voting process has been described as "labor-intensive and fragmented."[38] "Shareholder proposals at annual meetings, both mandatory and precatory," play an important role in an organization's governance structure but often lead to many close contests.[39] The traditional procedures of corporate governance are not designed to resolve issues related to close outcomes of corporate votes, empty voting practices, the proxy voting protocol, verification of shareholder identities, and access to corporate

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an ideal candidate to implement such a program. John McCrank, *Nasdaq Says to Develop Blockchain Services in Estonia*, REUTERS (Nov. 13, 2015), https://www.reuters.com/article/us-nasdaq-blockchain-estonia-idUSKCN0T301H20151114.

29. *Is Blockchain the Answer to E-voting? Nasdaq Believes So*, *supra* note 28.

30. The blockchain ledger serves as a record of shareholder ownership details and voting right token transfers. *Id.*

31. *Id.*

32. *Id.*

33. A custodian holder is a financial institution that holds shareholders' securities for safekeeping to mitigate risk of theft or loss. A custodian may also have the right to perform actions, such as making payments or changing investments, in the shareholder's name. Adam Barone, *Custodian*, INVESTOPEDIA (Apr. 26, 2019), https://www.investopedia.com/terms/c/custodian.asp.

34. *Is Blockchain the Answer to E-voting? Nasdaq Believes So*, *supra* note 28.

35. *Id.*

36. *See id.*

37. David Yermack, *Corporate Governance and Blockchains*, 21 REV. FIN. 7, 23 (2017) [hereinafter Yermack, *Corporate Governance*].

38. Nasdaq, *supra* note 20.

39. Marcel Kahan & Edward Rock, *The Hanging Chads of Corporate Voting*, 96 GEO. L. J. 1227, 1230 (2008).

records. Moreover, shareholders of large corporations rely on the board for information and often have little access to corporate records with minimal avenues of verifying the validity of the information provided.[40]

This Note considers how the Estonian model of e-Residency, or "Estonia's gift to the world,"[41] can be applied to a U.S. market to enhance corporate governance and improve shareholder engagement. Part I of this Note examines the current shareholder voting process, arguments for increased shareholder activism, and a blockchain protocol's potential to alleviate the issues associated with shareholder representation in corporate governance. Part II explores recent initiatives to enact blockchain-friendly legislation in the United States, specifically in Delaware and New York. Part III proposes a strategy for New York to leverage blockchain technology and Nasdaq's working model in Estonia for use in New York incorporated entities' corporate governance, particularly to increase shareholder transparency and activism.

While the use of blockchain can alleviate concerns in corporate governance regarding access to real-time accounting, it may come at the cost of making proprietary information available to non-shareholders.[42] This Note proposes the use of blockchain technology within the confines of a corporate voting system. Blockchain—in the context of voting—is a relatively straightforward application of the technology and can be "tested for potential further implementation in governance."[43] Finally, this Note discusses that this kind of transition would have to first take place on an institutional level before it is enacted into legislation. If New York passed legislation recognizing the use of blockchain technology as a means for corporate voting, it would ensure its standing as a leader in blockchain innovation. As a result, Nasdaq and other secondary securities markets might be encouraged to implement broader blockchain protocols for New York markets, thus streamlining corporate governance. Ultimately, this could incentivize innovation-driven entities to incorporate in New York.

40. Lewis Cohen & Soraya Ghebleh, *On Governance: How Will Blockchain Technology Change Organizational Governance?*, CONF. BOARD (Mar. 21, 2018), https://www.conference-board.org/blog/postdetail.cfm?post=6734.

41. Korjus, *supra* note 10.

42. Yermack, *Corporate Governance*, *supra* note 37, at 24.

43. Fiammetta S. Piazza, *Bitcoin and the Blockchain as Possible Corporate Governance Tools: Strengths and Weaknesses*, 9 BOCCONI LEGAL PAPERS 125, 150 (2017).

I. FOUNDATIONAL CONSIDERATIONS

A. BACKGROUND

1. Blockchain Primer

Currently, "there is no universally agreed-upon definition for blockchain" technology, neither institutionally nor legislatively.[44] Fundamentally, blockchain technology operates as an autonomous, distributed ledger that sequentially records data inputs.[45] The ledger itself is compiled from a list of time-stamped transaction records that are verified using a type of consensus, which varies by platform.[46]

Within a blockchain protocol, data is not stored on a centralized server; instead, it exists on a secure, distributed, and decentralized network.[47] Without an intermediary, a transaction is validated when consensus is achieved among all the participating parties.[48] By using cryptographic, peer-to-peer transactions, information is constantly recorded and interchanged between all of the users of the blockchain protocol.[49] Once a transaction's validity is agreed upon by the users, the transaction is recorded on the ledger and available for viewing but cannot be edited or deleted.[50] Each transaction creates a time-stamped "block" that is recorded on the ledger; the blocks are considered to be immutable because the "transactions are all linked and rely on the others to be correct."[51] A blockchain protocol is inherently transparent, which bolsters participants' confidence and trust in each transaction.[52] Essentially, the ledger acts as "a perfect, immutable audit trail of who did what and when they did it."[53]

A blockchain protocol may exist as a public, *unpermissioned* ledger or a private, *permissioned* ledger. Unpermissioned ledgers are freely accessible

44. CAMILLE MOORE, BROOKS RAINWATER & ELIAS STAHL, NAT'L LEAGUE OF CITIES, BLOCKCHAIN IN CITIES 9 (2018).

45. *See* Sloane Brakeville and Bhargav Perepa, *Blockchain Basics: Introduction to Distributed Ledgers*, IBM DEVELOPER (Mar. 18, 2018), https://developer.ibm.com/tutorials/cl-blockchain-basics-intro-bluemix-trs/.

46. MOORE, RAINWATER & STAHL, *supra* note 44.

47. *See* Brakeville & Perepa, *supra* note 45.

48. Anne Lafarre & Christoph Van der Elst, *Blockchain Technology for Corporate Governance and Shareholder Activism* 5 (Eur. Corp. Governance Inst. Working Paper No. 390, 2018), http://ssrn.com/abstract=3135209.

49. *See* Brakeville & Perepa, *supra* note 45.

50. *See id.*

51. MOORE, RAINWATER & STAHL, *supra* note 44, at 10.

52. Lafarre & Van der Elst, *supra* note 48, at 5.

53. Andrea Tinianow & Caitlin Long, *Delaware Blockchain Initiative: Transforming the Foundational Infrastructure of Corporate Finance*, HARV. L. SCH. F. ON CORP. GOVERNANCE (Mar. 16, 2017), https://corpgov.law.harvard.edu/2017/03/16/delaware-blockchain-initiative-transforming-the-foundational-infrastructure-of-corporate-finance/.

and not operated by a single user or group of participants.[54] Permissioned ledgers are managed by a central organization or group of participants who define the rules by which the protocol operates and restricts access only to authorized users.[55] The managers of the permissioned protocol are given the authority validate transactions and participate in the consensus mechanism.[56] Typically, permissioned ledgers are used in recording systems to "keep track of specific documents, transactions, status of settlements and even votes and shares of companies, making it suitable for shareholder voting purposes."[57]

Permissioned protocols effectively limit who may participate in the consensus mechanism and requires permission to read the information on the ledger. These protocols have been criticized for not being sufficiently decentralized to be considered blockchain technology at all, but merely shared ledgers.[58] There is still much disagreement surrounding how participant roles are defined and largely how blockchain protocols are governed.

2. Smart Contracts

A smart contract is "a computerized transaction protocol that executes the terms of a contract."[59] In his 1994 academic article, Nick Szabo, a legal scholar and cryptographer, introduced the concept of smart contracts. He proposed that smart contracts are designed to satisfy contractual conditions and "minimize the need for trusted intermediaries."[60] It is helpful to think of smart contracts as self-executing agreements that operate based upon a completed contingency; once the conditions are met, the contract self-executes to enforce the conditions of the agreement using code that is embedded in a decentralized, distributed record.[61] Since smart contracts are

54. U.K. GOV'T CHIEF SCI. ADVISER, DISTRIBUTED LEDGER TECHNOLOGY: BEYOND BLOCK CHAIN 17 (Government Office for Science, 2016).

55. *Id.*

56. The participants of the consensus mechanism verify each transaction. *What Is a Permissioned Blockchain Network*, GITHUB, https://github.com/monax/legacy-content/blob/master/learn/permissioned_blockchains.md (last visited Jan. 8, 2020).

57. Lafarre & Van der Elst, *supra* note 48, at 4 n.14.

58. *See What is the Difference Between Public and Permissioned Blockchains?*, COINDESK (Mar. 17, 2017), https://www.coindesk.com/information/what-is-the-difference-between-open-and-permissioned-blockchains.

59. Nick Szabo, *Smart Contracts* (1994), http://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart.contracts.html.

60. *Id.*

61. Ksenia Sussman, *Smart Contracts Won't Displace Lawyers – But They Will Require a Smarter Approach*, LAW.COM (Dec. 11, 2019), https://www.law.com/legaltechnews/2019/12/11/smart-contracts-wont-displace-lawyers-but-they-will-require-a-smarter-approach/; Andrea Tinianow, *Blockchain For Lawyers*, PRIV. EQUITY & VENTURE CAP. COMMITTEE (AM. BAR ASS'N, Chicago, IL), Spring 2018, at 1, 7, https://www.americanbar.org/content/dam/aba/administrative/business_law/newsletters/CL930000/full-issue-201804.authcheckdam.pdf.

deployed in a decentralized environment, such as a blockchain platform, they are self-verifying and immutable by design.[62]

3. Vote Tokens

In a blockchain election, eligible voters receive tokens, occasionally called "vote coins," that may be transmitted to addresses on a blockchain protocol to register preferences.[63] In the context of corporate voting, a vote token acts as a ballot.[64] First, a voter's identity is verified, then the voter is issued a 'digital wallet' containing the voter's credentials.[65] The wallet may only be accessed by the voter or a voter's designated proxy. Next, vote tokens are deposited into a voter's wallet; subsequently, the vote tokens may be transmitted to a specific address,[66] thus representing a vote.[67]

B. HISTORY OF SHAREHOLDER RIGHTS IN CORPORATE VOTING

Traditionally, shareholder governance of publicly-listed corporations is dictated by relevant state corporation law, various securities exchange regulations, and tax law.[68] Shareholders hold the power to elect the board of directors.[69] Additionally, shareholders participate in corporate action and decision making, including review of new stock issuance, proposal of amendments to corporate bylaws, and approval of mergers and acquisitions.[70]

Annually, shareholders are entitled to vote on these issues at "a meeting of the shareholders."[71] The annual general meeting is held on a date set by the bylaws of the corporation.[72] The board, or any person authorized by the certificate of incorporation or the bylaws, may also call a special meeting of the shareholders.[73] However, the only business that may be transacted at a special meeting of the shareholders must be related to the issues set forth in the notice of the meeting.[74] Typically, state corporation laws provide that a record date be fixed in advance of any vote pertaining to corporate governance. New York law provides that "such date shall not be more than

62. Friðrik Þ. Hjálmarsson & Gunnlaugur K. Hreiðarsson, *Blockchain-Based E-Voting System*, REYKJAVIK U., https://skemman.is/bitstream/1946/31161/1/Research-Paper-BBEVS.pdf.

63. Yermack, *Corporate Governance*, *supra* note 37, at 23.

64. Bennett Garner, *How Blockchain Voting Works & Why We Need It*, COIN CENT. (May 12, 2019), https://coincentral.com/how-blockchain-voting-works-why-we-need-it/.

65. Nir Kshetri & Jeffrey Voas, *Blockchain-Enabled E-Voting*, IEEE SOFTWARE, July/Aug. 2018, at 1, https://blockchain.ieee.org/images/files/pdf/blockchain-e-voting2018.pdf.

66. Each address is associated with a candidate, policy, or initiative.

67. Garner, *supra* note 64.

68. *See* Kahan & Rock, *supra* note 39, at 1232.

69. N.Y. BUS. CORP. LAW § 614 (McKinney 2019).

70. David Yermack, *Shareholder Voting and Corporate Governance*, 2 ANN. REV. OF FIN. ECONOMICS 103, 103 (2010) [hereinafter Yermack, *Shareholder Voting*].

71. N.Y. BUS. CORP. LAW § 602 (McKinney 2019).

72. *Id.*

73. *Id.*

74. *Id.*; *see also* N.Y. BUS. CORP. LAW § 605 (McKinney 2019).

sixty nor less than ten days before the date of such meeting, nor more than sixty days prior to any other action."[75] Also, under New York law, an inspector is appointed by the board of directors to determine: (1) the number of shares outstanding, (2) the voting power of each, (3) the shares represented at the meeting, (4) the existence of a quorum, and (5) validity and effect of proxies.[76] Additionally, an inspector receives votes, ballots, or consents; hears and determines all changes and questions arising in connection with the right to vote; counts and tabulates all votes, ballots or consents; and ultimately determines the result of the vote or election.[77] New York law requires inspectors to conduct these processes fairly.[78]

The annual general meeting plays an important role for shareholder control.[79] It offers shareholders a venue to become informed on the issues, discuss and ask questions, and ultimately make decisions.[80] However, as corporations grow and shareholders become more dispersed, annual general meetings tend to become costlier events yielding lower shareholder participation.[81] Large publicly traded corporations encourage cross-border investments, which bring greater pressures for investor involvement and the need for a "secure, cost-effective and flexible solution that facilitates shareholder participation and voting from a distance."[82]

1. Proxy Voting

Due to the diversity of corporate ownership, corporate elections are typically held through corporate proxy systems.[83] Shareholders are authorized to transfer their voting rights to a proxy to vote on their behalf instead of having a physical presence at the shareholder meeting.[84] While the proxy voting system allows corporations to reach a quorum of voters without having all shareholders present at the meeting, these procedures are nonetheless subject to high levels of inaccuracy which stem from "inexact voter lists, incomplete distribution of ballots, and problematic vote tabulation."[85]

Shareholder proxy elections are notably archaic. These elections have seen minimal procedural advancements over the years via modern technology.[86] To set the stage, prior to the late 1960s, the transfer of securities

75. N.Y. BUS. CORP. LAW § 604 (McKinney 2019).
76. N.Y. BUS. CORP. LAW § 611(a) (McKinney 2019).
77. *Id.*
78. *Id.*
79. Lafarre & Van der Elst, *supra* note 48, at 8.
80. *Id.*
81. *See Is Blockchain the Answer to E-voting? Nasdaq Believes So*, *supra* note 28.
82. *Id.*
83. Piazza, *supra* note 43, at 149.
84. N.Y. BUS CORP. LAW § 609(a) (McKinney 2019).
85. Piazza, *supra* note 43, at 149.
86. Yermack, *Corporate Governance*, *supra* note 37, at 23.

was labor intensive and subject to many complications.[87] In the traditional certificate-based system, shareholders were issued paper share certificates. A certificate would be registered with the issuer, then once it was traded, it would be "surrendered to the issuer or its transfer agent" to confirm that the transfer was registered.[88] The physical certificate transfer system was eliminated once the mechanical issues arising out of processing paperwork for securities transfers reached "crisis proportions."[89] Since then, the United States adopted a policy to encourage custodial ownership by which share certificates are held though a depository system.[90] Now, most shares of publicly traded companies are held in "street name"[91] of its custodian bank or brokerage firm, which holds the shares in accounts at the Depository Trust Company (DTC).[92] The record owner is registered on the company's books.[93]

Before the votes are tabulated, the corporation must identify and locate the beneficial owner, distribute the proxy materials, and collect the votes.[94] In order to find the beneficial owner, the stock issuer must solicit the DTC to obtain a list of custodians who hold shares under the issuers account.[95] As required under the Exchange Act Rule 14a-13, the issuer must send a "search card" to the custodial banks and brokerage firms requesting the number of proxies listed.[96] Adding to the complexity, a beneficial owner may 'opt out' of having their name disclosed to the issuer, designating the shareholder a "non-objecting beneficial owner" (NOBO).[97] As such, issuers cannot identify their shareholders with certainty.[98] In this case, "most custodians delegate the

87. *See generally* UCC § 8 Prefatory Note (AM. LAW INST. & UNIF. LAW COMM'N 1994) (UCC Article 8 dictates how investment securities transactions are regulated).

88. *Id.*

89. *Id.*

90. Kahan & Rock, *supra* note 39, at 1237.

91. When a brokerage firm hold securities in "street name," the firm holds the securities in its name or of another nominee and not in the record owners name. However, the firm will keep records that show the owner of the security as the real or "beneficial owner." *See Street Name*, U.S. SEC. & EXCH. COMM'N, https://www.sec.gov/fast-answers/answersstreethtm.html (last visited Feb. 14, 2020).

92. The DTC is a registered clearing agency under the U.S. Securities and Exchange Commission that retains custody of active securities issues in order to "reduce costs and provide clearing and settlement efficiencies by immobilizing securities and making 'book-entry' changes to ownership of securities." It is also a member of the U.S. Federal Reserve System. *See* DTCC, *The Depository Trust Company (DTC)*, DTCC, http://www.dtcc.com/about/businesses-and-subsidiaries/dtc (last visited Feb. 15, 2020).

93. Kahan & Rock, *supra* note 39, at 1237.

94. *Id.* at 1243.

95. *Id.*

96. *Id.* at 1244. A "search card" acts as an inquiry and includes record, mail, and meeting dates. After the receipt of the search card, the banks, broker, and nominee must mail materials to the beneficial owners. BROADRIDGE, ANNUAL MEETING GUIDEBOOK: A GUIDE TO BROADRIDGE'S CORPORATE ISSUER SERVICES 66 (2019), https://www.broadridge.com/_assets/pdf/broadridge-cp-guidebook-2019.pdf.

97. Kahan & Rock, *supra* note 39, at 1244.

98. *Id.* at 1244–45.

task of processing proxies and other corporate communications to Broadridge [Financial Solutions, Inc.[99]], the dominant provider of proxy services."[100]

The issuer is tasked with providing the custodian or Broadridge with the proxy materials, including proxy cards, a proxy statement, and the annual report.[101] In 2007, the U.S. Securities and Exchange Commission (SEC) amended its proxy rules to allow public companies to furnish the proxy materials online and permit shareholders digital access by electronic delivery via email.[102] The beneficial owner may then vote by either receiving an executed proxy card[103] from their custodian or requesting voting instructions.[104] Typically, Broadridge will "receive[] voting instructions, verif[y] receipt, verif[y] that the signatories have voting authority, execute[] the proxy on behalf of its custodian (bank or broker) principal aggregating the instructions it has received, and then forwards the proxies to the 'tabulator.'"[105]

Finally, the tabulator must validate the proxy materials that the issuer receives.[106] The tabulator must verify "the number of nominee shares voted equals the number of shares that DTC indicates are held in nominee name."[107] This is an onerous task that is "subject to a considerable degree of inaccuracy."[108] In particular, critics indicate that the adoption of modern electronic registration of share ownership in the late 1960s was not coordinated with novel voting procedures.[109]

2. Empty Voting

Corporations must "define both a date as of which a list of shareholders qualified to vote is determined and a mechanism for determining the identity of the shareholders entitled to vote as of that date."[110] As previously stated, state corporate law sets a "record date" to be fixed in advance of any vote. As of the record date, the registered owners of shares on the company's books are entitled to notice of, and to vote at, the shareholder meeting.[111] An

99. *See Broadridge Financial Solutions, Inc.*, REUTERS, https://www.reuters.com/companies/BR (last visited Feb. 15, 2020).

100. Kahan & Rock, *supra* note 39, at 1244.

101. *Id.* at 1245–46.

102. Internet Availability of Proxy Materials, Exchange Act Release, No. 55, 146, Investment Company Act Release No. 27, 671, 72 Fed. Reg. 4148.

103. Proxy cards instruct a proxy how to vote on a shareholder's behalf at a shareholders' meeting. *Annual Meetings and Proxy Requirements*, U.S. SEC. & EXCH. COMM'N, https://www.sec.gov/smallbusiness/goingpublic/annualmeetings (last visited Feb. 28, 2020).

104. Kahan & Rock, *supra* note 39, at 1247 n.84.

105. *Id.* at 1247.

106. *Id.*

107. *Id.* at 1248.

108. Piazza, *supra* note 43, at 149.

109. Yermack, *Shareholder Voting*, *supra* note 70, at 106.

110. Kahan & Rock, *supra* note 39, at 1232–33.

111. *Id.* at 1233.

investor may temporarily sell their shares to others and use their borrowed shares or combinations of derivative securities to acquire temporary voting rights, a practice known as empty voting. The temporary owner does not, however, enjoy the capital benefits of ownership.[112] Critics worry that empty voting practices disjoin ownership and voting rights, which subsequently does not adequately represent the economic interests of the permanent shareholder.[113] Moreover, when empty voting practices occur between the record date and the shareholder meeting date, it becomes very difficult for ownership to be traced back to the beneficial owners.[114]

C. ARGUMENTS FOR INCREASED SHAREHOLDER ACTIVISM

1. Benefits of a Streamlined and Transparent Corporate Voting Mechanism

Shareholders of large, public firms would benefit from a voting process that is "streamlined and transparent" and meeting results that are recorded swiftly and precisely so that the results may be relied upon in "a legally binding way."[115] Minority shareholders are primarily individuals and typically burdened with the complicated process of assigning a proxy and exercising their voting rights.[116] For that reason, minority shareholders often find the shareholder voting process futile and lack the motivation to vote at all.[117] Additionally, the current voting mechanisms for foreign shareholders, who wish exercise their voting rights, are quite complex, as "expectations of means of authentication, understanding the process and relevant laws and local practices are high."[118] The high levels of inaccuracy caused by miscommunications and untallied votes are no surprise considering the amount of materials needed for the proxy voting process and the number of intermediaries and shareholders involved in modern-day corporate governance.[119]

112. Piazza, *supra* note 43, at 150.

113. *See* Stephen Taub, *SEC to Address 'Empty Voting*, INSTITUTIONAL INV. (July 27, 2010), https://www.institutionalinvestor.com/article/b150qg2zl5904b/sec-to-address-empty-voting.

114. *"Empty Voting" and Other Fault Lines Undermining Shareholder Democracy: The New Hunting Ground for Hedge Funds*, LATHAM & WATKINS, LLP (Apr. 2007), https://www.lw.com/upload/pubContent/_pdf/pub1878_1.Commentary.Empty.Voting.pdf.

115. CSD WORKING GROUP ON DLT, GENERAL MEETING PROXY VOTING ON DISTRIBUTED LEDGER 5 (Nov. 2017), https://www.nsd.ru/common/img/uploaded/files/gm_proxy_voting.pdf.

116. *Id.*

117. *Id.*

118. *Id.*

119. Vito J. Racanelli, *Proxy Voting Is Broken and Needs to Change*, BARRON'S (July 6, 2018), https://www.barrons.com/articles/proxy-voting-is-broken-and-needs-to-change-1530924318?mod=article_inline [hereinafter Racanelli, *Proxy Voting Is Broken*].

2. Close Outcomes of Corporate Votes

A leading Delaware lawyer "estimate[d] that, in a contest that is closer than 55 to 45%, there is no verifiable answer to the question 'who won?'"[120] Yet, most close elections are decided in favor of management and likely yield poor outcomes for minority shareholders.[121] Under the traditional procedure, management becomes aware of the likely outcomes of the voting process and influences the vote in favor of its interests.[122] While the mechanisms that management uses to obtain likely voting outcomes is unclear, it has been surmised that management obtains highly accurate information near the end of the voting period and, subsequently, implements competitive campaign efforts to sway the vote in its favor.[123]

Further, corporate management utilizes its resources to canvas the beneficial owners early on in the voting process. Management often achieves this "by hiring a proxy solicitation firm" prior to submitting a proposal in order to consider opposition to its proposal.[124] In response, if management believes it is unlikely to win the proposal, then "it will often withdraw or alter the proposal."[125] Otherwise, management "will typically submit a definitive proxy proposal 30 days before an actual vote," if it is confident it will prevail.[126]

3. Breaking the Chain of Custody: Shareholder Access to Corporate Information

Corporations hold their executive powers in the board of directors. Shareholders of large corporations rely on the board for information with limited access to corporate records or verification tools. Again, shareholders are resigned to trust the board.[127] Thus, shareholders are often left without a means of confirming that their votes were counted or that their stock ownership is accurately represented in the corporation.

a. Proctor & Gamble Co. Proxy Fight

Proctor & Gamble Co.'s (P&G) October 2017 shareholder election of new directors is deemed "the most expensive proxy fight in history" and cost the both sides $60 million.[128] P&G announced that the existing twelve person board of directors was re-elected, yet opponent Nelson Peltz, the CEO of

120. Kahan & Rock, *supra* note 40, at 1279.
121. Yermack, *Corporate Governance*, *supra* note 37, at 23.
122. *Id.*
123. Yair Listokin, *Management Always Wins the Close Ones*, 10 AM. L. & ECON. REV. 159, 162 (2008).
124. *Id.* at 164.
125. *Id.*
126. *Id.*
127. Cohen & Ghebleh, *supra* note 40.
128. Racanelli, *Proxy Voting Is Broken*, *supra* note 119.

hedge-fund Trian Fund Management, was narrowly victorious.[129] An independent tally accounted for 42,780 more votes for Nelson Peltz than the incumbent P&G director; with an estimated two billion votes cast, the outcome was a margin of .0016% of the shares outstanding.[130] As a result, with many being paper ballots, P&G had to recount the nearly two billion votes.[131] P&G eventually conceded "[b]ecause the election results were so close, and because a large number of shareholders voted for Nelson Peltz to be a director."[132]

Professionals and practitioners critique the P&G proxy battle as "just the latest failure in the proxy system"; this process has not been reformed to address the concerns of "producing an erroneous result in a close vote."[133] The high-profile and expansiveness of the P&G proxy battle makes it an excellent case study that "magnifie[s] the inconsistencies of the system."[134] Millions of proxy cards[135] from both sides were "disallowed on technical grounds" and not counted, which resulted from a "break in the chain of custody."[136] The rationale for disqualification of proxy cards ranged from a name change that was not updated on the shareholder list to a signature that did not match the ballot to a ballot that was inadvertently separated from its proxy.[137] Additionally, a primary concern was that many beneficial shareholders did not have shares registered in their own name and were not informed that their votes did not count towards the vote, as "end-to-end [vote] confirmation"[138] disclosure is not mandated in the proxy voting process.[139]

129. *See* Matt Levine, *P&G Could Use the Blockchain in Its Next Proxy Fight*, BLOOMBERG (Nov. 17, 2017), https://www.bloomberg.com/opinion/articles/2017-11-17/p-g-could-use-the-blockchain-in-its-next-proxy-fight.

130. *Id.*

131. Siddharth Cavale, *P&G Appoints Peltz to Board despite Losing Proxy Battle*, REUTERS (Dec. 15, 2017) https://www.reuters.com/article/us-procter-gamble-trian/pg-appoints-peltz-to-board-despite-losing-proxy-battle-idUSKBN1E92ZA.

132. *Id.*

133. Racanelli, *Proxy Voting Is Broken*, *supra* note 119.

134. *Id.*

135. Proxy cards instruct a proxy how to vote on a shareholder's behalf at a shareholder meeting. *Annual Meetings and Proxy Requirements*, U.S. SEC. & EXCH. COMM'N, https://www.sec.gov/smallbusiness/goingpublic/annualmeetings (last visited Feb. 28, 2020).

136. Racanelli, *Proxy Voting Is Broken*, *supra* note 119.

137. *Id.*

138. End-to-end vote confirmation ensures shareholders and corporations that votes have been properly cast and correctly tabulated. JOHN L. WEINBERG CTR. FOR CORP. GOVERNANCE, REPORT OF ROUNDTABLE ON PROXY GOVERNANCE: RECOMMENDATIONS FOR PROVIDING END-TO-END VOTE CONFIRMATION 6 (Aug. 2011), https://www.sec.gov/comments/4-725/4725-5254751-183746.pdf.

139. Racanelli, *Proxy Voting Is Broken*, *supra* note 119.

b. In Re Dole Food Company, Inc.'s Vote Recount

In the case of *In Re Dole Food Company, Inc.*, Dole Food Company, Inc. (Dole) executed a single-step merger[140] as a means of taking its firm private.[141] As consideration for the merger agreement, Dole's shareholders of record and Cede & Co., the nominee of the DTC, were to be distributed $13.50 per share.[142] The DTC used its centralized ledger to identify the participant members based upon the information provided about their positions and distributed merger considerations accordingly.[143] The plaintiff class, holders of Dole's common stock shares, brought a class action suit against Dole's fiduciaries.[144] The parties settled the case and drafted a stipulation that the proceeds, $2.74 per share plus interest, was "to be distributed to class members through a traditional claims process."[145]

In order to account for the class's claims, A.B. Data, the settlement administrator, mailed 24,322 hard copies of the claims forms and notices to potential class members, brokers, and other nominees.[146] Other claimants were alerted by summary notice in *PR Newswire* and were instructed to submit claims to A.B. Data.[147] The 4,662 paper claims and 3,788 e-filed claims were merged into a single database and were reviewed by A.B. Data.[148] The claims process accounted for 36,793,758 shares, but the claimants submitted facially valid claims for 49,164,415 shares: 33% more common stock than actually existed.[149]

Class counsel spoke with a DTC representative who revealed that "DTC's centralized ledger did not reflect all of the trades in the Dole common stock on the day of the merger or during the two days preceding it." [150] This was of particular concern because during the three days leading up to the closing of the merger "more than 32 million shares of Dole common stock

140. A single step merger is the "merger of one legal entity into another." A single step merger requires the approval of a definitive merger agreement (between the acquiring entity and the target entity) by the board of directors and separate approval by the shareholders of the target entity's outstanding stock. LATHAM & WATKINS, LLP, GUIDE TO ACQUIRING A US PUBLIC COMPANY 3 (2015), https://www.lw.com/thoughtLeadership/lw-acquiring-a-us-public-company-for-the-non-us-acquirer.

141. *In re Dole Food Co., Inc. Stockholder Litigation*, C.A. No. 8703-VCL 1, 1 (Del. Ch.). Dole's going private transaction resulted in its shares of common stock being ceased to be traded on the New York Stock Exchange. C. Michael Carter, *David H. Murdock Completes Acquisition of Dole Food Company, Inc.*, BUS. WIRE (Nov. 1, 2013), https://www.businesswire.com/news/home/20131101005872/en/David-H.-Murdock-Completes-Acquisition-Dole-Food.

142. *In re Dole Food Co., Inc. Stockholder Litigation*, C.A. No. 8703-VCL 1, 1 (Del. Ch.).

143. *Id.*

144. *Id.*

145. *Id.*

146. *Id.* at 2–3.

147. *Id.* at 3.

148. *Id.*

149. *Id.* at 1.

150. *Id.* at 5.

changed hands."[151] As a result, both DTC participants who held shares as reflected on DTC's centralized ledger and beneficial owners[152] were able to submit ostensibly valid claims, "even though they involved the same underlying shares."[153]

The court recognized that without detailed records of the millions of trades that took place during the critical period leading up to the settlement closing, "it would be impossible to determine who owned the shares as of closing."[154] It would require A.B. Data to verify the records of over 800 DTC participant brokers and custodial banks, as well as obtain information for the individual clients of the brokers and custodial banks.[155] If the participants failed to respond, "the court ha[d] no readily available means to compel cooperation."[156] Vice Chancellor Laster, in his opinion, gave credence to blockchain technology as a potential resolution to the cumbersome process of validating the record of ownership.[157] He recognized that "distributed ledger technology offers a potential technological solution by maintaining multiple, current copies of a single and comprehensive stock ownership ledger."[158]

D. HOW BLOCKCHAIN CAN ALLEVIATE THE ISSUES ASSOCIATED WITH SHAREHOLDER REPRESENTATION IN CORPORATE GOVERNANCE

Effective corporate governance motivates corporate board members to act in the best interest of their stakeholders[159] and, similarly, motivates stakeholders to actively participate in the decision-making processes. Classically, annual general meetings and subsequent proxy disputes are subject to procedural flaws, usually, arising from managerial inefficiencies.[160] The primary concerns that occur from these intermediary relationships and remote voting procedures "have to do with *transparency, verification and identification*"—the key aspects of a functioning blockchain protocol.[161] Transparency and disclosure are foundational elements of an effective corporate governance framework because they provide shareholders the basis for informed decision-making and ensure that

151. *Id.* at 6.
152. Here, the beneficial owners were the clients of the DTC participants who acquired the shares during this period.
153. *In re Dole Food Co., Inc. Stockholder Litigation*, C.A. No. 8703-VCL 1, 6 (Del. Ch.).
154. *Id* at 7.
155. *Id.*
156. *Id.*
157. *Id.* at 9.
158. *Id.*
159. This includes the corporate law requirement of management's fiduciary duties of loyalty and care to their shareholders. Cohen & Ghebleh, *supra* note 40.
160. *See generally* Lafarre & Van der Elst, *supra* note 48.
161. *Id.* at 15.

management will be held accountable, maybe even scrutinized, for their conduct.[162] Authentication and identification of shareholders, along with their accompanying voting power, is an arduous process that is often disrupted by intermediary involvement.[163] A blockchain protocol can lower the costs of shareholder voting, facilitate greater shareholder participation, and alleviate the subsequent transactional costs that are bound to occur as corporations grow.

1. Proxy Voting

Using a blockchain protocol for the proxy voting process allows votes to be recorded swiftly and securely. Not only does blockchain technology significantly reduce the costs of monitoring agency and disclosure requirements, it also establishes a greater level of trust between the board and the shareholders.[164] By using a blockchain protocol, shareholders are granted permission to access real-time records of the proposals and can observe the voting process as it occurs.[165] Additionally, implementing a blockchain protocol in the shareholder voting procedure can motivate shareholder autonomy by allowing shareholders to participate in corporate governance more frequently and precisely.

Blockchain technology allows for increased transparency in the voting process. When both management and shareholders are granted access to the real-time voting on the ledger, they are both able to access the likely voting outcomes and may respond to effectively promote their interests. Moreover, a blockchain protocol maintains a more transparent record of ownership of shares and permits "visible real-time observation of transfers or shares from one owner to another."[166] Additionally, proxy assignment itself is streamlined using blockchain technology as voting rights from the shareholder may be transferred directly to the assigned proxy holder.[167]

By using a permissioned blockchain that is managed by the firm and accessible only by the shareholders, both management and shareholders may place proposals.[168] In this context, a blockchain protocol contains smart contracts that are governed by voting regulations, which include the relevant state law, the firm's bylaws, and relevant stock exchange rules.[169] For

162. Benjamin Fung, *The Demand and Need for Transparency and Disclosure in Corporate Governance*, 2 UNIVERSAL J. MANAGEMENT 72, 73 (2014), http://www.hrpub.org/download/20140105/UJM3-12101630.pdf.

163. *See generally id.*

164. Cohen & Ghebleh, *supra* note 40.

165. *Id.* The blockchain ledger is distributed by design; with each transaction, the ledger is automatically updated, replicated, and ultimately verified by participating shareholders. Lafarre & Van der Elst, *supra* note 48, at 15.

166. Yermack, *Corporate Governance*, *supra* note 37, at 9.

167. Lafarre & Van der Elst, *supra* note 48, at 18.

168. *Id.* at 16.

169. *Id.*

example, once a proposal is placed by a shareholder or member of management, those who hold shares in the firm are immediately notified and may exercise their voting rights during the time period dictated by the governing regulations.[170]

Blockchain scholars propose that shareholder voting via a blockchain protocol would lessen the restrictions that shareholders face when making proposals.[171] It has been surmised that shareholders would be able "to submit any proposal they want," and only proposals that are supported by a sufficient number of votes from other shareholders would be presented to the board, therefore ensuring that "legitimate shareholder concerns are addressed."[172]

2. Verification of Shareholder Identity/Ownership and Empty Voting Practices

A blockchain protocol alleviates the issue of ownership verification in empty voting practices. The implementation of blockchain technology ensures that the rearrangement of voting rights occurs well in advance of the voting scheme and notice is provided to shareholders, management, and regulators of a redistribution of voting power.[173] A blockchain protocol can be used to record the ownership of securities that are reported by the central securities depository and, in turn, facilitates issuance of vote tokens to each shareholder based on the depository's holdings.[174] If a shareholder is issued a vote token and owns the voting right asset associated with the token, then the shareholder could use the token to cast votes on meeting agenda items.[175]

3. Close Outcomes of Corporate Votes

One of the many institutional concerns regarding the shareholder voting process is the diminished trust in the "end-to-end vote confirmation,"[176] which allows shareholders to confirm that their vote was "counted and recorded as cast."[177] As there are currently no agreed upon systems that "guarantee end-to-end confirmation," votes are often "undercounted, overcounted or not counted at all."[178] This naturally diminishes shareholder

170. *Id.*

171. Aaron Wright & Primavera De Filippi, Decentralized Blockchain Technology and the Rise of *Lex Cryptographia* 1, 37 (Mar. 10, 2015) (unpublished manuscript), https://ssrn.com/abstract=2580664.

172. *Id.*

173. Yermack, *Corporate Governance*, *supra* note 37, at 24.

174. *Is Blockchain the Answer to E-voting? Nasdaq Believes So*, *supra* note 28.

175. *Id.*

176. Brian Croce, *Improving Proxy-Voting System Discussed at SEC Roundtable*, PENSIONS & INVESTMENTS (Nov. 15, 2018), https://www.pionline.com/article/20181115/ONLINE/181119902/improving-proxy-voting-system-discussed-at-sec-roundtable.

177. Vito J. Racanelli, *A Call for SEC to Lead in Proxy Vote Overhaul*, BARRON'S (Nov. 16, 2018), https://www.barrons.com/articles/a-call-for-sec-to-lead-in-proxy-vote-overhaul-1542397945 [hereinafter Racanelli, *A Call for SEC*].

178. Croce, *supra* note 176.

confidence in the system.[179] On November 15, 2018, the SEC held a staff roundtable on the proxy process to address some of these concerns.[180] There, the SEC considered topics including the "accuracy, transparency, and efficiency in the proxy system," low shareholder participation, decreased confidence in the current system, and appropriate technological measures that could be used to enhance accountability, and efficiency in the proxy voting process.[181] Trian Fund Management's Chief Legal Officer, Brian Schorr, called for rules all intermediaries should be required to follow to ensure "end-to-end confirmation" within the voting process.[182] Following Trian Fund Management's involvement in P&G's 2017 exorbitant proxy battle,[183] it is not surprising they are seeking to compel reformation of the system. Panelists, including Schorr and Robert Schifellite, Broadridge's President of Investor Communication Solutions, called for the SEC to mandate pilot programs to test blockchain technology's use for greater accountability in the proxy voting process.[184]

II. LEGISLATION AND REFORM

A. CURRENT STATE OF LEGISLATION IN THE UNITED STATES

Federal lawmakers and industry stakeholders have been challenged with coming to a consensus regarding a definition of blockchain technology, as well as if and how it can be regulated.[185] With regard to blockchain technology's use for governmental functions and supply chain management in commerce, there were great strides made in 2018 towards developing a common definition of blockchain and leveraging its use in an increasingly digitized global economy.[186] However, the power lies within individual states to enact regulation that encourages blockchain implementation, as the federal government has not yet exercised its constitutional preemption power to oversee blockchain-based mechanisms.[187]

179. *Id.*

180. Press Release, Jay Clayton, Chairman, U.S. Sec. & Exch. Comm'n, Statement Announcing SEC Staff Roundtable on the Proxy Process (July 30, 2018).

181. *Id.*

182. Racanelli, *A Call for SEC*, *supra* note 177.

183. Racanelli, *Proxy Voting Is Broken*, *supra* note 119.

184. Racanelli, *A Call for SEC*, *supra* note 177.

185. *See generally* Kirill Bryanov, *US Federal Government: Confusing Regulation for Crypto, Full Clearance For Blockchain*, BITCOIN INSIDER (Dec. 16, 2018), https://www.bitcoininsider.org/article/51933/us-federal-government-confusing-regulation-crypto-full-clearance-blockchain.

186. Press Release, Doris Matsui, U.S. Congresswoman, Matsui, Guthrie Introduce H.R. 6913, the Blockchain Promotion Act of 2018 (Oct. 1, 2018).

187. Joanna Diane Caytas, *Blockchain in the U.S. Regulatory Setting: Evidentiary Use in Vermont, Delaware, and Elsewhere*, THE COLUMBIA SCI. AND TECH. L. REV (May 30, 2017), http://stlr.org/2017/05/30/blockchain-in-the-u-s-regulatory-setting-evidentiary-use-in-vermont-delaware-and-elsewhere/#_ednref31. Notably, in 2018, Wyoming passed legislation that provides that "a person who develops, sells, or facilitates the exchange of an open blockchain token is not subject to specified securities and money transmission laws." The state has also amended its

1. Delaware Blockchain Initiative

Delaware has established itself as a leader in blockchain innovation through its Delaware Blockchain Initiative and by passing new legislation to allow for the use of blockchain technology in corporate record keeping.[188] In 2016, the Delaware Office of the Governor communicated its optimism for the Delaware Blockchain Initiative as it sought to "enabl[e] [the] regulatory and legal environment for the development of blockchain technology and to welcome blockchain companies to locate in the state."[189]

The Delaware Blockchain Initiative was implemented in three steps. First, the Delaware Blockchain Initiative developed a beta test for how distributed ledger technology may operate at the Delaware Public Archives.[190] This stage of the Initiative introduced "smart records" to "automate[] compliance with laws pertaining to retention and destruction of archival documents."[191]

Second, on July 21, 2017, the Delaware Blockchain Amendments were introduced in Senate Bill 69 and signed into law, which amended the Delaware General Corporation Law to address the authorization of "distributed ledger shares" by Delaware corporations.[192] The Delaware Blockchain Amendments "eliminated the requirement of a central authority to maintain the stock ledger, and with it certain risks of human error related to the issuance and transfer of shares."[193] The Amendments authorize the issuance of shares and maintenance of a stock ledger using a blockchain protocol.[194] Additionally, they recognize there is no longer a need for a

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corporate law to "authorize corporations to use electronic networks . . . for the creation or maintenance of corporate records; authorizes the use of a network address to identify a corporations shareholder . . . [and] accept shareholders votes if signed by a network signature that corresponds to a network address." H.B. 70, 64th Legis. Sess. (Wy. 2018); H.B. 101, 64th Legis. Sess. (Wyo. 2018).

188. *See generally* S.B. 182, 149th Gen. Assemb. Sess. (Del. 2017); S.B. 183, 149th Gen. Assemb. Sess. (Del. 2017); S.B. 194, 149th Gen. Assemb. Sess. (Del. 2017). Delaware sought to "provide specific statutory authority for Delaware corporations to use networks of electronic databases (examples of which are described currently as "distributed ledgers" or a "blockchain") for the creation and maintenance of corporate records, including the corporation's stock ledger." S.B. 69, 149th Gen. Assemb. Sess. (Del. 2017).

189. DEL. OFFICE OF THE GOVERNOR, *Governor Markell Launces Delaware Blockchain Initiative*, CISION (May 2, 2016, 9:30 AM), https://www.prnewswire.com/news-releases/governor-markell-launches-delaware-blockchain-initiative-300260672.html.

190. Tinianow & Long, *supra* note 53.

191. *Id.*

192. *See generally* S.B. 182, 149th Gen. Assemb. Sess. (Del. 2017); S.B. 183, 149th Gen. Assemb. Sess. (Del. 2017); S.B. 194, 149th Gen. Assemb. Sess. (Del. 2017); *see* S.B. 69, 149th Gen. Assemb. Sess. (Del. 2017).

193. Andrea Tinianow, *Tokenized Securities Are Not Secured By Delaware Blockchain Amendments*, FORBES (July 4, 2018, 12:35 PM), https://www.forbes.com/sites/andreatinianow/2018/07/04/tokenized-securities-are-not-secured-by-delaware-blockchain-amendments/#579c39e33e79.

194. *Id.*

transfer agent to record and maintain the issuances and transfers.[195] This bill, however, requires that the stock ledger must be administered "by or on behalf of the corporation."[196] Fundamentally, while blockchain allows for the transfer of shares without the presence of an intermediary, the bill does not "authorize the use of blockchain technology without some involvement by the corporation."[197]

Finally, the Delaware Blockchain Initiative launched a proof of concept to "(1) automate the release or renewal of Uniform Commercial Code (UCC) filings and related collateral, (2) increase the speed of searching UCC records, (3) reduce mistakes and fraud and (4) cut cost."[198] Once Delaware's Division of Corporations introduces Symbiont's[199] blockchain and smart instrument platform, many operations will potentially become automated, including but not limited to, name and address change notices and changes to collateral descriptions and secured parties.[200]

In response, Ethereum, the leading open source platform for decentralized applications, developed a token specification, ERC-884, that purports to "allow for the creation of tradable ERC-20 tokens where each token represents a numberless . . . share issued by a Delaware corporation" to represent equity in the firm.[201] Creators of the ERC-884 token assert that a corporation can employ an ERC-884 token to raise funds by an initial public offering or private equity sale, in accordance with Delaware Corporations Law, but concurrently bypass "the need for a custom share registry, or the involvement of a traditional stock exchange or transfer agent."[202]

Blockchain technology has and will continue to have a "revolutionary impact" on secondary securities markets, such as Nasdaq and the New York

195. *Id.*

196. S.B. 69, 149th Gen. Assemb. Sess. (Del. 2017).

197. Matthew J. O'Toole & Michael K. Reilly, *The First Block in the Chain: Proposed Amendments to the DGCL Pave the Way for Distributed Ledgers and Beyond*, HARV. L. SCH. F. ON CORP. GOVERNANCE (Mar. 16, 2017), https://corpgov.law.harvard.edu/2017/03/16/the-first-block-in-the-chain-proposed-amendments-to-the-dgcl-pave-the-way-for-distributed-ledgers-and-beyond/#8.

198. Tinianow & Long, *supra* note 53.

199. Symbiont is a smart contracts platform designed for institutional blockchain applications. SYMBIONT, https://symbiont.io (last visited Mar. 1, 2020).

200. Joshua Ashley Klayman, Geoffrey R. Peck & Mark S. Wojciechowski, *Why The Delaware Blockchain Initiative Matters To All Dealmakers*, FORBES (Sept. 20, 2017, 9:55 AM), https://www.forbes.com/sites/groupthink/2017/09/20/why-the-delaware-blockchain-initiative-matters-to-all-dealmakers/#8d2ab6675508. As of 2017, Delaware's new administration under Governor John Carney "has shown far more caution [for the Delaware Blockchain Initiative] than its predecessor," and has not continued on with implementation of this project. Karl Baker, *Delaware Eases off Early Blockchain Zeal After Concerns over Disruption to Business,* DEL. ONLINE (Feb. 1, 2018), https://www.delawareonline.com/story/news/2018/02/02/delaware-eases-off-early-blockchain-zeal-after-concerns-over-disruption-business/1082536001/.

201. Dave Sag, *Tokenising Shares: Introducing ERC-884*, MEDIUM (Apr. 16, 2018), https://medium.com/coinmonks/tokenising-shares-introducing-erc-884-cc491258e413.

202. *Id.*

Stock Exchange.[203] It must be recognized that the Delaware Blockchain Amendments "address only the use of blockchain technology in connection with the issuance and transfer of record ownership of stock at the corporate level, and do not address transfer of beneficial ownership of stock in secondary securities markets, which . . . are not within the purview of Delaware corporate law."[204] Founding Director of Global Delaware, Andrea Tinianow, who conceived and directed the Delaware Blockchain Initiative, makes clear that "the Delaware Blockchain Amendments . . . do *not* provide blanket authority for share of stock of a Delaware corporation to be tokenized." [205] Tinianow points to the ERC-884 token and recognizes that while it is "designed to *transfer* shares of stock, the share ownership information is captured in an *off-chain* database," which contradicts the intention of the Amendments.[206] She clarified that ERC-884's tokenized protocol still requires a third-party intermediary.[207] Only once the list of shareholders and their accompanying information is reconciled with the firm's on-chain stock transfer information, then a sufficient decentralized stock ledger may be implemented and the Amendments implicated.[208]

Additionally, the Amendments are not immediately accessible to all Delaware corporations. Corporations that still represent their shares with certificates may not operationalize a blockchain protocol "as the procedures for transferring certified shares are not compatible with the notion of shares being transferred via smart contract through a distributed ledger platform."[209]

2. New York

a. New York's BitLicense

Currently, New York remains well behind other states in implementing innovative solutions to corporate governance.[210] In August 2015, New York Department of Financial Services enacted "BitLicense," one of the first defined regulatory frameworks for virtual currency business in the United States.[211] With the issuance of BitLicense regulations, New York anticipated becoming a global hub for innovative fintech and virtual currency ventures and saw it as an opportunity to advance in the competition against rival financial centers attempting to attract innovative start-ups to 'set up shop.'

203. O'Toole & Reilly, *supra* note 197.
204. *Id.*
205. Tinianow, *supra* note 193.
206. *Id.*
207. *Id.*
208. *Id.*
209. *Id.*
210. *See* Matthew E. Kohen & Justin S. Wales, *State Regulations on Virtual Currency and Blockchain Technologies*, CARLTON FIELDS (Aug. 29, 2019), https://www.carltonfields.com/insights/publications/2018/state-regulations-on-virtual-currency-and-blockchain-technologies.
211. *See* N.Y. COMP. CODES R. & REGS. tit. 23, § 200 (2015).

The BitLicense regulation targets companies that operate in New York and serve New York residents, and requires that "[n]o person shall, without a license obtained from the superintendent . . . engage in any Virtual Currency Business Activity."[212] The regulation defines Virtual Currency Business Activity as: (1) engaging in virtual currency transmission or receipt, excluding transactions for non-financial purposes and those that do not involve more than a nominal amount of virtual currency; (2) "storing, holding, or maintaining custody or control of [v]irtual [c]urrency" for others; (3) "buying or selling [v]irtual [c]urrency as a customer business"; (4) "performing [e]xchange [s]ervices as a customer business; or (5) "controlling, administering or issuing a [v]irtual [c]urrency."[213] Moreover, any company or individual that engages in Virtual Currency Business Activity without a license is prohibited from operating in New York or serving New York residents.[214]

BitLicense provides a legal protection and framework for virtual currency ventures "without a need for proving legitimacy of their work to customers."[215] However, from the outset, the program has been met with criticism.[216] The application process itself has proven to be quite burdensome and prohibitive, especially for smaller start-ups. Filing for a BitLicense can cost up to $5,000, and filing requires disclosure of personal and private information, as well as compliance with complex anti-fraud and money laundering procedures.[217] Other criticisms of the BitLicense regulations come from the limitations set forth in the regulations themselves, including the requirement of the superintendent's prior written approval if a venture wishes to offer a new product or service.[218] Others challenge the BitLicense regulation for its blanket authority because it attempts to treat virtual currency operators as if they were traditional money transmitters, which are, by design, better equipped to respond to restrictive regulations.[219] Additionally, the review process has an accumulated backlog of applications since its introduction. The Department of Financial Services awarded only six Bit License's between June 2015 and June 2018.[220]

212. N.Y. COMP. CODES R. & REGS. tit. 23, § 200.3(a) (2015).

213. N.Y. COMP. CODES R. & REGS. tit. 23, § 200.2(q) (2015).

214. N.Y. COMP. CODES R. & REGS. tit. 23, § 200.3(a).

215. *BitLicense News*, COINTELEGRAPH, https://cointelegraph.com/tags/bitlicense (last visited Mar. 1, 2020).

216. *See* Stan Higgins, *New York Lawmakers Open to Revisiting the BitLicense*, COINDESK (Feb. 23, 2018), https://bit.ly/34GdfNa.

217. REUTERS, *New York's Bitcoin Hub Dreams Fade with Licensing Backlog*, CNBC (Oct. 31, 2016, 4:25 AM), https://www.cnbc.com/2016/10/31/new-york-bitcoin-hub-dreams-fade-with-licensing-backlog.html.

218. N.Y. COMP. CODES R. & REGS. tit. 23, § 200.10 (2015).

219. Kohen & Wales, *supra* note 210.

220. Nikhilesh De, *New York's Financial Regulator Is Reviewing the Controversial BitLicense*, COINDESK (Oct. 22, 2019), https://www.coindesk.com/new-yorks-financial-regulator-is-reviewing-the-controversial-bitlicense. However, in twenty months since June 2018, sixteen licenses have been

Many industry stakeholders have found the regulation to be antithetical to free market innovation of the nascent digital currency landscape and to the values of decentralization that are the basis of the crypto-industry and blockchain technology.[221] In response to the BitLicense enactment, many digital currency ventures decided to make a statement by refusing to apply for the license and left New York.[222] For these ventures, this meant either physically moving their headquarters out of the state or withdrawing service from New York customers.[223]

In early 2018, New York State senators held a roundtable with industry stakeholders to discuss their views of the BitLicense regulation.[224] The purpose of this hearing was for state representatives to provide a forum for those in the blockchain and digital currency community to voice their concerns in preparation for possible reforms to the regulation and new legislation proposals.[225] Ultimately, attendees agreed that the burdens of acquiring a BitLicense must be loosened. Notably, Gilles Gade, Chief Executive of Cross River Bank, called for the regulation to distinguish digital currency from blockchain, as those who work in the broader applications of the technology should not be subjected to the BitLicense and ultimately stifle innovation.[226]

New York must continue to take steps like the BitLicense roundtable to guarantee its place as global hub and regulatory leader for digital currency and blockchain ventures. It is promising that the state senators expressed their interest in continuing similar conversations with industry stakeholders and community members to keep them actively involved in the reform process,[227] yet the conversation has been criticized for failing to invite representatives from the Department of Financial Services, [228] the state financial regulator that "manages license applications and . . . regulation of virtual currency business activity."[229] On October 22, 2019, Linda Lacewell, the Superintendent of the Department of Financial Services, confirmed that the agency was looking into possible adjustments to the BitLicense in order to

added. This demonstrates the Department of Financial Services' increasing response rate to financial service market innovations as of October 22, 2019. *Id.*

221. Daniel Roberts, *Behind the "Exodus" of Bitcoin Startups from New York*, FORTUNE (Aug. 14, 2015), http://fortune.com/2015/08/14/bitcoin-startups-leave-new-york-bitlicense/.

222. *Id.*

223. *Id.*

224. Maria Terekhova, *New York's BitLicense May See Reform*, BUS. INSIDER (Feb. 27, 2018), https://www.businessinsider.com/new-yorks-bitlicense-may-see-reform-2018-2.

225. *Id.*

226. Higgins, *supra* note 216.

227. *Id.*

228. Terekhova, *supra* note 224.

229. *Virtual Currency Businesses*, N.Y. DEP'T FIN. SERVS., https://www.dfs.ny.gov/apps_and_licensing/virtual_currency_businesses.

"adapt to . . . [the] changing industry," yet she did not mention when the review would be completed or its implications for industry stakeholders.[230]

b. New York's Blockchain Bills

Four bills have been proposed in the New York State Assembly that have the potential to secure New York's place as a leader in fostering innovation in fintech and blockchain technology. The first bill, S4142, aims to amend the state technology law by defining the terms "blockchain technology" and "smart contract."[231] The bill would provide legal clarity for how digital signatures and records are recognized and secured *vis-a-vis* a blockchain transaction.[232] This bill passed in the Senate on April 9, 2019 and was assigned to the Assembly Governmental Operation Committee.[233] The second bill, A.B. 1351, instructs the state board of elections to evaluate how a blockchain protocol may be used to protect against voter fraud and promote cybersecurity in assessing voter records and election results.[234] This bill also passed in the Senate on June 18, 2019.[235] The third bill, A.B. 8793, was assigned to the Assembly Governmental Operations Committee, and mandates a study as well as a task force to determine whether a blockchain protocol would be effective if implemented in the state government for "record keeping, information storage, and service delivery."[236] The fourth bill, A.B. 8783-B, calls for a task force to study the impact of digital currencies on New York State's financial markets.[237] The proposed analysis would also "review . . . the State's Department of Financial Services' BitLicense program and its impact on the use of digital currencies,"[238] and "provide legislative and regulatory recommendations, if any, to increase

230. De, *supra* note 220.

231. H.R. S4142, N.Y. State Assemb. B. (N.Y. 2019). "Blockchain technology" is defined as "distributed ledger technology that uses a distributed, decentralized, shared and replicated ledger, which may be public or private, permissioned or permissionless, or driven by tokenized crypto economics or tokenless. *Id.* The data on the ledger is protected with cryptography, is immutable and auditable and provides an uncensored truth." *Id.* "Smart contract" is defined as "an event driven program that runs on a distributed, decentralized, shared and replicated ledger and that can take custody over and instruct transfer of assets on that ledger." *Id.*

232. H.R. S4142, N.Y. State Assemb. B. (N.Y. 2019); CORP. SERV. CO., BLOCKCHAIN & EMERGING TECHNOLOGY LEGISLATION 1,8 (July 26, 2019), https://www.cscglobal.com/blog/wp-content/uploads/2019/07/Blockchain_Chart_07262019.pdf.

233. CORP. SERV. CO., *supra* note 232.

234. H.R. A1351, N.Y. State Assemb. B. (N.Y. 2019).

235. Heather Morton, *Blockchain 2019 Legislation*, NAT'L CONF. ST. LEGISLATURES (July 23, 2019), http://www.ncsl.org/research/financial-services-and-commerce/blockchain-2019-legislation.aspx.

236. H.R. A08793, N.Y. State Assemb. B. (N.Y. 2017).

237. *Id.*

238. Nicole Kramer, *Four Blockchain Technology Bills Proposed by New York Assemblyman*, PROSKAUER (Dec. 18, 2017), https://www.blockchainandthelaw.com/2017/12/four-blockchain-technology-bills-proposed-by-new-york-assemblyman/.

transparency and security, enhance consumer protections,[239] and to address the long term impact related to cryptocurrency."[240]

III. RECOMMENDATIONS FOR SUCCESSFUL IMPLEMENTATION: IMPLICATIONS FOR POLICY FRAMEWORK TO BE DEVELOPED WITH INNOVATION IN MIND

While the current state of blockchain regulation lies within the purview of state law, the Delaware Blockchain Initiative and its accompanying amendments to Delaware corporate law demonstrate the need for cooperation between the public corporations, the state of incorporation, and the secondary securities markets in order to truly be impactful on corporate governance. The Delaware Blockchain Initiative amendments allow for a distributed stock ledger to be adopted at the corporate level, which "may foster more expansive uses of the technology,"[241] yet this is only the first step in enhancing shareholder activism and legitimizing blockchain technologies use for managing shareholder assets.

Currently, the legal gray areas surrounding blockchain technology lead to uncertainty and constrictions in its application whilst operating within the confines of existing legislation.[242] If there is a stronger sense of institutional competence and regulatory consensus before a state enacts policy, then controversial regulation, like BitLicense, will be avoided.

Given New York's reputation as a global financial capital that has historically attracted international business and supported innovation across industries, industry stakeholders have questioned why the New York regulators have implemented institutionally burdensome regulation.[243] In 2018, New York began to realize it must remain competitive by enacting blockchain-friendly legislation, as lawmakers are encouraging collaboration between legislators and industry leaders to reach some level of agreement around the policy and design of blockchain protocols. With many states entrenched in a race to enact the most blockchain-friendly policy,[244] it would be prudent to encourage industry and legislative leaders in New York to collaborate when drafting regulations that define terms and roles of the technology; this kind of cooperation would ensure there is some level of agreement around the policy and design of blockchain protocols. Similar to Delaware, New York's legislature must also consider proposing a bill that

239. H.R. 8783-B, N.Y. State Assemb. B. (N.Y. 2017).
240. *Id.*
241. O'Toole & Reilly, *supra* note 197.
242. *See* Korjus, *supra* note 10.
243. *See generally* Terekhova, *supra* note 224.
244. *See* Adam James, *These US States Are Racing to Become the Country's Crypto Capitol*, BITCOINIST (Feb. 8, 2018), https://bitcoinist.com/states-racing-to-become-blockchain-capital-of-u-s.

allows corporations to maintain their corporate records and oversee record ownership using distributed ledger technology that "set[s] out the framework for participation and any applicable rules governing the transfer of securities on [a] distributed ledger."[245]

Some of the most practical uses of blockchain technology are becoming more prominent across industries: supply chain management, digital asset protection and exchange, virtual currency money transmission, and digital identity verification. Technology that monitors how we access our data, conduct e-voting, or digitally sign documents is useless without policy framework to ensure improper access of our data is punished, e-votes are counted, and digitally signed agreements are legally binding. Yet, for such a shift to be implemented in the realm of corporate governance and shareholder voting in U.S. markets requires "true industry leadership, significant investment and years of planning."[246]

Estonia has the advantage of being able to react quickly when new legislation is needed to support emerging industries.[247] Estonia's governance system is also completely digitized, which allowed for a seamless transition for the Estonian/Nasdaq blockchain initiative. Estonia's "open-minded attitude towards technology and fintech innovation" also allowed for Nasdaq to implement its protocol with ease.[248] With Estonia's advantage of having a fully digitized government, secure remote identification in remote annual general meeting voting was made possible by using Estonian's secure digital IDs via e-Residency.[249] The New York solution needs to be approached on a different scale.

Secondary securities exchanges across the world are trying their hand at leveraging distributed ledger technology in order to enhance corporate governance and traditional corporate voting systems.[250] Secondary securities exchanges' adoption of distributed ledger technology would "significantly reduce the cost, complexity, and increase the speed of trading and settlement processes in a secure manner."[251]

If New York wishes to stand apart from other states that are enacting blockchain-friendly regulation and encourage innovative blockchain-based

245. O'Toole & Reilly, *supra* note 197; *see* H.R. S4142, N.Y. State Assemb. B. (N.Y. 2019) (proposing to allow "signatures, records and contract secured through blockchain technology to be considered in an electronic form and to be an electronic record and signature" and to allow "smart contracts to exist in commerce").

246. Rich Daly, *Blockchain: Wall Street's Most Game-Changing Technology Advance Since the Internet*, BROADRIDGE, https://www.broadridge.com/article/blockchain-wall-streets-most-game-changing-technology-advance-since-the-internet (last visited Mar. 1, 2020).

247. Korjus, *supra* note 10.

248. *Is Blockchain the Answer to E-Voting? Nasdaq Believes So*, *supra* note 28.

249. Lafarre & Van der Elst, *supra* note 48, at 21.

250. Prableen Bajpai, *How Stock Exchanges Are Experimenting with Blockchain Technology*, BRAVE NEWCOIN (June 14, 2017), https://bravenewcoin.com/insights/how-stock-exchanges-are-experimenting-with-blockchain-technology.

251. *Id.*

startups to incorporate in the state, New York must be willing to implement a platform for shareholders of New York publicly traded corporations to be securely identified and authenticated. The Estonian e-Residency platform provides the guidelines for a such a platform; New York residents may 'opt-in' to having their shareholder identities maintained on a central securities depository, such as when residents are issued driver's licenses.[252] In Estonia, Nasdaq had the advantage of maintaining the country's central securities depository and providing Nasdaq access to Estonian shareholders' securities ownership data.[253] New York must either maintain its own distributed stock ownership ledger within the state or partner with a secondary securities exchange, such as the New York Stock Exchange, Nasdaq, or a private blockchain venture to ensure that shareholder ownership is securely maintained. This platform would theoretically eliminate the need for a traditional intermediary, such as the DTC,[254] to locate the beneficial shareholder and allow for a seamless transition for a secondary securities exchange to implement blockchain-based shareholder voting. It would also automate a corporations "inspector"[255] role in determining the number of shares, the voting power of the shares, the proxies' validity, and providing a platform to maintain votes and ballots, and conducting the tabulation of the votes.

CONCLUSION

Blockchain technology has the potential to disrupt corporate governance functioning by providing a transparent, verifiable, and efficient means of enhancing shareholder engagement and representation. For effective application, New York should look towards the implementation of a distributed ledger-based central securities depository. This measure, combined with the passing of New York's pending blockchain bills and amending its corporate law to authorize corporations to maintain their

252. This option is analogous to being given the option to register to vote when applying for a driver's license at the Department of Motor Vehicles in New York state.

253. *Is Blockchain the Answer to E-voting? Nasdaq Believes So*, *supra* note 28.

254. This should not be interpreted to imply that the proposal can bypass the DTC, or other securities clearing agencies, entirely. Entities must comply with Section 17A of the Securities Exchange Act and Rule 17Ab2-1 which requires registration with the SEC prior to performing functions of a clearing agency. U.S. Securities and Exchange Commission, *Clearing Agencies*, U.S. SEC. & EXCH. COMM'N, https://www.sec.gov/tm/clearing-agencies (last visited May 10, 2020). The SEC encourages comments from the public concerning modification of its rules, framework and policies; in its current form, the securities filings framework is not designed for implementation of new technologies to innovate and enhance processes. The first step would be to recommend a distributed ledger protocol to interoperate with the DTC. From there, the SEC would recognize the value distributed ledger technologies have in securities markets. This may lead to the SEC's approval of a distributed ledger protocol clearing agency to provide functions of a central securities depository. For the purposes of this note, the intricacies of the registration process pursuant to Section 17A will not be discussed.

255. N.Y. BUS. CORP. LAW § 611(a) (McKinney 2019).

corporate records using distributed ledger technology, would communicate to the world that New York state embraces blockchain technology. Notably, New York can redefine itself as an attractive, forward-looking state for innovative ventures that wish to support shareholder activism and revolutionize corporate functioning.

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