Wyoming Law Review

Volume 21 | Number 2 Article 7

2021

Blockchain Voting: WY Not?

Jacob Beckett

Comment

Blockchain Voting: WY Not?

*Jacob Beckett**

I. Introduction

The most recent election cycle ended in a morass of pandemic woes, maladroit ballot counting, and a flummoxed American public.[1] With many believing the

* J.D. Candidate, University of Wyoming College of Law, Class of 2021. I would like to thank Professor George Mocsary for being my introduction into this emerging field of blockchain and the law, and for supporting my endeavors in making this Comment a reality. Further, I would like to offer my sincere gratitude to Matt Kaufman and Chris Land for their guidance with both the technology and the regulation of blockchain. Finally, I would like to thank all those who entertained my newfound interest and assisted in editing this Comment, especially Amina Malik and Taylor Means.

[1] Ann Gerhart, *Election Results Under Attack: Here are the Facts*, Wash. Post (Jan. 4, 2020, 11:12 AM), www.washingtonpost.com/elections/interactive/2020/election-integrity/; Jeff Amy et al., *Trump, on Tape, Presses Ga. Official to 'Find' Him Votes*, AP News (Jan. 4, 2020), apnews.com/article/election-2020-joe-biden-donald-trump-georgia-elections-a7b4aa4d8ce3bf52301ddbe620c6bff6 (discussing Donald Trump's attack on the ballot-counting in Georgia after election officials had already counted votes three times); Domenico Montanaro, *Poll: Just A Quarter Of Republicans Accept Election Outcome*, NPR (Dec. 9, 2020, 12:00 PM), www.npr.org/2020/12/09/944385798/poll-just-a-quarter-of-republicans-accept-election-outcome [https://perma.cc/5XV8-CW33].

importance of voting to be at an all-time high,[2] voter turnout—through one method or another—reached record numbers.[3] Intrinsically tied to the pandemic, this included a record number of voters casting their ballots by means other than in person.[4]

This influx of mailed-in ballots caused substantial and unprecedented delay in the counting and reporting of ballots.[5] This only served to further stoke the agitated masses.[6] Although certainly not a new topic,[7] this began a newly impassioned discussion promoting digital voting.[8] While many have advocated for and imagined a web portal[9] or biometrically secured technique,[10] a better option may be hiding in plain sight.[11]

Although viewed by some as little more than a buzzword,[12] discussion and use of blockchain technology has quickly gained traction.[13] While generally tied to

---

[2] John Gramlich, *20 Striking findings from 2020*, PEW RSCH. CTR. (Dec. 11, 2020), www.pewresearch.org/fact-tank/2020/12/11/20-striking-findings-from-2020/ [https://perma.cc/Y7US-9S58] (analyzing a study reporting that eight-in-ten registered voters stated that this election "really mattered," which was the highest level since at least 2000); *see also* Laura Bliss & Sarah Holder, *Nevada, What Took So Long?*, BLOOMBERG CITYLAB (Nov. 11, 2020, 11:25 AM), www.bloomberg.com/news/articles/2020-11-11/why-counting-the-2020-ballots-is-taking-so-long [https://perma.cc/D2N5-333G].

[3] Domenico Montanaro, *President-Elect Joe Biden Hits 80 Million Votes in Year of Record Turnout*, NPR (Nov. 25, 2020, 9:06 AM), www.npr.org/2020/11/25/937248659/president-elect-biden-hits-80-million-votes-in-year-of-record-turnout [https://perma.cc/86TG-NFCS].

[4] *Id.*

[5] *See Understanding Election Results*, VOTE.ORG (Dec. 16, 2020), www.vote.org/election-results/ [https://perma.cc/3SMV-QL84].

[6] Bliss & Holder, *supra* note 2.

[7] *See, e.g.*, Kimberly C. Delk, *What Will It Take to Produce Greater American Voter Participation? Does Anyone Really Know?*, 2 LOY. J. PUB. INT. L. 133, 167 (2001); R. Michael Alvarez & Jonathan Nagler, *The Likely Consequences of Internet Voting for Political Representation*, 34 LOY. L.A. L. REV. 1115, 1117–20 (2001).

[8] *Blockchain Voting Debate Heats Up After Historic Election*, GOV'T TECH. (Nov. 20, 2020), www.govtech.com/products/Blockchain-Voting-Debate-Heats-Up-After-Historic-Election.html [https://perma.cc/9ZFF-RMN9].

[9] Michelle Mount, *Innovations in Internet Voting Systems*, 4 GEO. L. TECH. REV. 699, 701 (2020) (revealing that, at least in the case of overseas military voters, a number of states accept absentee ballots via email, and others utilize a web-based portal).

[10] *See* VOATZ, voatz.com/ (last visited Dec. 16, 2020) [https://perma.cc/267Y-MG9U].

[11] *See infra* notes 159–289 and accompanying text.

[12] Parmy Olson, *A Two-Minute Guide to Blockchain*, FORBES (Dec. 4, 2018, 7:01 AM), www.forbes.com/sites/parmyolson/2018/12/04/a-two-minute-guide-to-blockchain/?sh=64a59fbd79c8.

[13] Steve McNew et al., *Blockchain Solutions: Practical B2B Supply Chain Applications*, JD SUPRA (Nov. 20, 2020), www.jdsupra.com/legalnews/blockchain-solutions-practical-b2b-68335/ [https://perma.cc/CP8B-AJP9].

cryptocurrency and fintech[14]—and rightfully so[15]—discussion of the underlying technology has become essentially mainstream.[16] While the discourse has yet to become voting-centric, advocates have pushed for the technology to be used in bettering proxy and other shareholder voting.[17]

Implementing a transparent,[18] secure,[19] and faster[20] manner of casting and counting votes seems to be the only option in avoiding a repeat of what will surely come to be known as one of the most tumultuous voting cycles in history.[21] A blockchain-supported voting system presents promise of voting in the digital age—and has begun to make a track record of just that.[22] Although these initial "pilots" of blockchain-enabled systems have been less than perfect from a variety of standpoints, these brave pioneers have provided those who follow with an idea of what to expect.[23] These domestic groundbreakers—the city of Denver, Utah County, Utah, the state of West Virginia and others—have relied on a private company to provide this exciting opportunity to some voters in

---

[14] *See id.* For more on cryptocurrency, see *How Do Ethereum Smart Contracts Work?*, CoinDesk (Dec. 30, 2020, 7:48 AM), www.coindesk.com/learn/ethereum-101/ethereum-smart-contracts-work [https://perma.cc/7MFG-FHD8].

[15] MK Manoylov, *Nearly $900 Million in VC Went to Crypto Companies in the Third Quarter of 2020*, Block (Oct. 18, 2020, 11:03 AM), www.theblockcrypto.com/linked/81492/nearly-900-million-in-vc-went-to-crypto-companies-in-the-third-quarter-of-2020 [https://perma.cc/2KL6-HNPP].

[16] *See* Rachel Wolfson, *Bitcoin and Blockchain Topics to Discuss with the Crypto Curious this Thanksgiving*, Cointelegraph (Nov. 26, 2020), cointelegraph.com/news/bitcoin-and-blockchain-topics-to-discuss-with-the-crypto-curious-this-thanksgiving [https://perma.cc/MD8Q-46XJ].

[17] *See* Spencer J. Nord, *Blockchain Plumbing: A Potential Solution for Shareholder Voting?*, 21 U. Pa. J. Bus. L. 706, 723–27, 731–34 (2019); *eVoting Technology is the Blockchain-enabled Electronic Voting Solution for Capital Markets and Beyond*, NASDAQ, www.nasdaq.com/solutions/evoting-technology (last visited Apr. 19, 2021) [https://perma.cc/8XTT-9SMF].

[18] *See generally* Primavera De Filippi & Aaron Wright, Blockchain and the Law: The Rule of Code 37–38 (2018).

[19] *Id.*

[20] *Id.*

[21] *See* James Oliphant, *U.S. Election Year Shaped by Pandemic and Trump's Defiance*, Reuters (Dec. 10, 2020, 5:17 AM), www.reuters.com/article/global-poy-usa-election/u-s-election-year-shaped-by-pandemic-and-trumps-defiance-idUSKBN28K1FU [https://perma.cc/HB2Z-SEBJ].

[22] Voatz, *supra* note 10.

[23] Michael A. Specter et al., *The Ballot is Busted Before the Blockchain: A Security Analysis of Voatz, the First Internet Voting Application Used in U.S. Federal Elections*, MIT (2020), internetpolicy.mit.edu/wp-content/uploads/2020/02/SecurityAnalysisOfVoatz_Public.pdf [https://perma.cc/B25W-5RG8]; *see, e.g.*, Greg Magarshak, *In Defense of Blockchain Voting*, Coindesk (Mar. 12, 2020, 10:13 AM), www.coindesk.com/in-defense-of-blockchain-voting [https://perma.cc/TD8T-LBWE]; Rachel Wolfson, *Blockchain Voting Systems Could Be the Future, but Current Flaws Persist*, Cointelegraph (Apr. 16, 2020), cointelegraph.com/news/blockchain-voting-systems-could-be-the-future-but-current-flaws-persist [https://perma.cc/5EDT-48UE].

the twenty-first century.[24] Somewhat antithetical to what one may imagine for governmental voting[25]—yet also in line with what is currently being utilized[26]—this Comment envisions a system provided by the government, initially pioneered by the "Wild West of Blockchain,"[27] Wyoming.

States have a broad amount of authority in how they provide and run elections.[28] While required to meet certain minimum requirements, the federal government has left states with an open door to explore polling options.[29] A government-provided blockchain would comply with these requirements to an even greater tune than the current system.[30] While some hold concerns over the security and privacy inherently necessary in the American polling place,[31] a properly developed and implemented system would overcome these concerns.[32]

Wyoming permits each voter to vote with an absentee ballot.[33] The State likewise has charged each citizen with a duty to assist absentee voters.[34] A blockchain-enabled voting system may be the most viable option for truly fulfilling these edicts. Bringing voting systems into the "Fourth Industrial Revolution"[35] will continue to ensure the integrity of voting in the great state of Wyoming.

---

[24] *See* VOATZ, *supra* note 10.

[25] *See* Lawrence Norden & Alan Beard, *There Is Shockingly Little Oversight of Private Companies that Create Voting Technologies*, BRENNAN CTR. FOR JUST. (Mar. 6, 2020), www.brennancenter.org/our-work/analysis-opinion/there-shockingly-little-oversight-private-companies-create-voting [https://perma.cc/8XRW-WFCL] (discussing both the lack of oversight election system's vendors are under and the surprising reality that private technology companies are so central to American elections).

[26] *Wyoming Chooses ES&S Paper-Based Technology*, ELECTION SYS. & SOFTWARE (Mar. 11, 2020), www.essvote.com/blog/our-customers/wyoming-chooses-ess-voting-machines/ [https://perma.cc/W5JC-28FF] (highlighting a local example of a privately developed election system being utilized for elections).

[27] Nolle Acheson, *Crypto Long & Short: Wyoming Is Crypto's 'Wild West,' Which Is Exactly What We Need*, COINDESK (Nov. 2, 2020, 9:10 AM), www.coindesk.com/crypto-regulation-custody-wild-west [https://perma.cc/9Q54-3HVJ].

[28] Jane Susskind, *Decrypting Democracy: Incentivizing Blockchain Voting Technology for an Improved Election System*, 54 SAN DIEGO L. REV. 785, 806–09 (2017).

[29] *Id.*

[30] *See id.*

[31] Specter et al., *supra* note 23, at 1–3, 14; *see generally* Barbara Simons, *Why Internet Voting Is Dangerous*, 4 GEO. L. TECH. REV. 543 (2020).

[32] Susskind, *supra* note 28, at 806–09, 810–11.

[33] WYO. STAT. ANN. § 22-9-102 (2021).

[34] *Id.* § 22-9-101 (charging Wyoming's citizens – among others – with a duty to assist election officials and absentee voters).

[35] J. P. Schmidt & Tung Chan, *The Future Infrastructure of Business: A Primer on Blockchain and the Evolving Regulations*, HAW. B.J., Apr. 2020, at 13; Klaus Schwab, *The Fourth Industrial Revolution: What it Means, How to Respond*, WORLD ECON. F. (Jan. 14, 2016), www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/ [https://perma.cc/834A-P956].

Part II introduces how blockchain technology functions—at a novice level—and the technology's importance to Wyoming.[36] Part III provides an overview of the federal and state requirements for implementing a new voting system.[37] Part IV introduces current and future blockchain voting measures[38] while Part V analyzes such a system under current requirements from Part III.[39] Part VI advocates for a proposal to be taken to implement a blockchain-enabled system,[40] and Part VII concludes by promoting access to democracy through a blockchain-enabled system.[41]

II. BACKGROUND

A. What Is Blockchain?

Blockchain is more than just a buzzword.[42] Blockchain technology underlies many cutting-edge technologies, such as cryptocurrency,[43] supply-chain management,[44] and smart-contracts.[45] Although originally introduced as a means of performing pseudonymous transactions through cryptocurrency,[46] the technology was intended to decentralize transactions generally and function as a trustless medium for users worldwide to engage with each other.[47] Decentralized platforms drastically reduce multiple security risks inherent in other systems by removing the central point of attack that central servers are inherently flawed by.[48]

---

[36] *See infra* notes 42–85 and accompanying text.

[37] *See infra* notes 86–158 and accompanying text.

[38] *See infra* notes 159–255 and accompanying text.

[39] *See infra* notes 256–90 and accompanying text.

[40] *See infra* notes 291–96 and accompanying text.

[41] *See infra* notes 297–301 and accompanying text.

[42] Olson, *supra* note 12.

[43] BITCOIN, bitcoin.org/en/ (last visited Dec. 17, 2020) [https://perma.cc/9P82-UKEF]; *Welcome to Ethereum*, ETHEREUM, ethereum.org/en/ (last visited Dec. 17, 2020) [https://perma.cc/5EKN-LLNV].

[44] Kari Korpela et al., *Digital Supply Chain Transformation toward Blockchain Integration*, PROC. OF THE 50TH HAW. INT'L CONF. ON SYS. SCIS. *passim* (2017), 128.171.57.22/bitstream/10125/41666/1/paper0517.pdf [https://perma.cc/6ZFC-NNG5].

[45] *How Do Ethereum Smart Contracts Work?*, *supra* note 14.

[46] *See* SATOSHI NAKAMOTO, BITCOIN: A PEER-TO-PEER ELECTRONIC CASH SYSTEM 1–8 (2008), bitcoin.org/bitcoin.pdf [https://perma.cc/J8DQ-56B4]. The original white paper only discussed the level of privacy as anonymous, but also included certain concessions noting the potential for others to discover a user's identity in a similar way that one would on the traditional stock market. *See id.* at 6.

[47] *Id.*

[48] *See generally id.*; Les Wilkinson & Curtis Capeling, *How to Understand Blockchain*, ACC DOCKET, Sept. 2018, at 66, 68, www.accdigitaldocket.com/accdocket/september_2018/

Although technologically quite complex, at their heart, blockchain systems operate by verifying transactions across a peer-to-peer network of "nodes" to ensure the integrity of each and every transaction.[49] Therefore, in the broadest sense, each transaction is verified by a simple majority of the nodes on the blockchain, which is often expressed as consensus.[50] Consensus is reached when the proposed transactions in a new "block" match across the majority of nodes.[51] The new block is verified and added onto the existing blocks—creating a chain.[52] Each new block must reference the "hash" (a unique fingerprint) of the previous block in the chain, which is how the verifying nodes authenticate the proposed transactions.[53] This decentralized approval process creates a chronologically oriented series of blocks that are each linked together though cryptographic signatures and timestamps.[54] This nonrepudiability is the backbone of the security of blockchain technology.[55] The highly tamper-resistant system would require tremendous effort to manipulate.[56]

Generally, blockchains also provide a lookback mechanism—a distributed ledger—that allows each user to audit every transaction that has occurred on the blockchain.[57] This legitimization provides a sense of trust in the trustless environment of digital transactions.[58] This transparent system is maintained on each device that utilizes the blockchain—which provides for an impressive amount of backup.[59] Each user may audit the entire history of the system, checking that each recorded transaction is authentic.[60] Many debate whether such transparency is useful or even possible in the realm of voting, but others recognize that this system offers many benefits.[61]

MobilePagedArticle.action?articleId=1418609#articleId1418609 [https://perma.cc/V5VD-X25G]; JOSEPH J. BAMBARA & PAUL R. ALLEN, BLOCKCHAIN: A PRACTICAL GUIDE TO DEVELOPING BUSINESS, LAW, AND TECHNOLOGY SOLUTIONS 228–31 (Lisa McClain et al. eds., 2018).

[49] BAMBARA & ALLEN, *supra* note 48, at 6.

[50] *Id.* at 16–18, 48–49.

[51] *Id.*

[52] DE FILIPPI & WRIGHT, *supra* note 18, at 22–26.

[53] *Id.*

[54] *Id.*

[55] *Id.*

[56] *Id.*

[57] *Id.*

[58] *Id.*

[59] BAMBARA & ALLEN, *supra* note 48, at 1, 4–6.

[60] DE FILIPPI & WRIGHT, *supra* note 18, at 22–26.

[61] Susskind, *supra* note 28, at 794–95, 806–08 (addressing the ability for voters to verify their vote during and after casting their own ballot, and independently verify vote counts otherwise).

Another aspect of blockchain technology that lends itself useful for implementation as a voting system is the ability to tally records.[62] With self-tallying voting already being implemented in the shareholder-voting realm, such a benefit could reduce vote counting errors in political elections as well.[63] A blockchain-enabled voting system would be able to operate without administration from a central party, thus relieving concerns of mishandling votes.[64]

However, with all great technology comes great legal questions.[65] Courts have yet to decide on how blockchain-enabled systems fit within current laws.[66] However, some emerging trends shed light on how the digital environment of blockchain-enabled systems may be treated in brick-and-mortar courthouses.[67] This new territory presents lawmakers with exciting opportunities. Lawmakers in Wyoming have already made significant strides in becoming the "Wild West of Blockchain."[68]

B. Blockchain Is Already Prominent in and Promising to WY

Becoming an early adopter of newly dreamt up legal frameworks is nothing new to Wyoming.[69] Furthering this reputation, Wyoming has enacted a multitude of blockchain-related pieces of legislation.[70] Through this, Wyoming has quickly become a leading force in the regulation of blockchain-based industries.[71] Wyoming became the first state to enact legislation both enabling banks to custody tokens and allowing initial coin offerings.[72] Structuring legislation and regulations

---

[62] *See* Nord, *supra* note 17, at 725, 732–33.

[63] *Id.*

[64] *Id.*

[65] *See generally* Jeremy A. Carp, *Autonomous Vehicles: Problems and Principles for Future Regulation*, 4 U. PA. J.L. & PUB. AFFS. 81 (2018); Lyria Bennett Moses, *Recurring Dilemmas: The Law's Race to Keep Up with Technological Change*, 2007 U. ILL. J.L. TECH. & POL'Y 239.

[66] *See* Morgan N. Temte, Comment, *Blockchain Challenges Traditional Contract Law: Just How Smart Are Smart Contracts?*, 19 WYO. L. REV. 87 (2019); *see* DE FILIPPI & WRIGHT, *supra* note 18, at 4–6, 50, 78–80.

[67] *See* BAMBARA & ALLEN, *supra* note 48, at 75–101.

[68] Acheson, *supra* note 27; Matt Kaufman, *Blockchain, Cryptocurrency and Tokens: What Is Wyoming Getting into and Does It Signal Where We Are Going?*, WYO. LAW., Feb. 2019, at 14, 15.

[69] Larry E. Ribstein, *The Emergence of the Limited Liability Company*, 51 BUS. LAW. 1, 3 (1995) (discussing Wyoming's hand in the emergence of the LLC).

[70] H.B. 19, 70, 101, 126, 64th Leg., Budget Sess. (Wyo. 2018); S.F. 111, 64th Leg., Budget Sess. (Wyo. 2018) (codified at scattered sections of WYO. STAT. ANN. tit. 17, WYO. STAT. ANN. §§ 40-22-102 to -110, WYO. STAT. ANN. § 39-11-105 (2018)).

[71] *See* Temte, *supra* note 66.

[72] WYO. STAT. ANN. §§ 13-12-101 to -103 (2021); *id.* § 17-4-206 (repealed Feb. 28, 2019).

that are developed with insight from industry and interested parties,[73] Wyoming has offered a forward-looking structure to enable growth in the blockchain sector.[74] Wyoming also provides many other benefits to those seeking to utilize blockchain technology.[75]

Current utilization of blockchain technology consumes a considerable amount of energy,[76] something that Wyoming is well-suited to accommodate.[77] Likewise, Wyoming has organized a Blockchain Coalition (Coalition) to assist in educating Wyomingites on the benefits blockchain promises.[78] This Coalition is on a commendable pursuit to help normalize blockchain technology and push for its implementation throughout the state.[79] Although not yet advocating directly for the implementation of blockchain-enabled voting systems, the Coalition has advocated for implementing this promising technology into governmental record keeping and campaign management[80]—both indirect and tangential to utilizing the technology for voting.

Further still, the Wyoming Legislature has formed a Blockchain Task Force (Task Force) to assist regulators in determining the best course forward in regulating the blockchain field within the state.[81] This Task Force has been charged with introducing blockchain-related bills for the Legislature's consideration.[82] Having already advanced multiple first-of-their-kind bills that were passed in 2018,[83] the Task Force has not stopped forging forward in paving a model regulatory system that other jurisdictions may adopt.[84] Commentators have noted how this new framework provides Wyoming with a unique opportunity to directly influence how blockchain technology may be regulated beyond the state itself.[85]

---

[73] *See* Matthew T. McClintock, *Understanding Wyoming's 2018 Blockchain Laws: A Model for Industry Regulation*, WYO. LAW., June 2018, at 40.

[74] *Id.*

[75] *See* Temte, *supra* note 66, at 91–93.

[76] *Id.*

[77] *Id.*

[78] *Id.* at 93.

[79] *Id.*

[80] *Wyoming Blockchain Coalition Announces Support for Blockchain in Wyoming*, BUS. WIRE (Nov. 14, 2017, 11:55 AM), www.businesswire.com/news/home/20171114006317/en/Wyoming-Blockchain-Coalition-Announces-Support-for-Blockchain-in-Wyoming [https://perma.cc/7GMH-ZK2C].

[81] *See* WYO. STAT. ANN. § 28-11-701 (2021).

[82] *Id.*

[83] *See supra* note 70 and accompanying text.

[84] *See* Temte, *supra* note 66, at 43.

[85] *See id.*; Caitlin Long, *What Do Wyoming's 13 New Blockchain Laws Mean?*, FORBES (Mar. 4, 2019, 7:29 AM), www.forbes.com/sites/caitlinlong/2019/03/04/what-do-wyomings-new-blockchain-laws-mean/?sh=3b77b9d95fde.

III. VOTING CONSIDERATIONS

A. Implementing Voting Changes

Authority over election measures is split between the federal and state governments.[86] Directed by the United States Constitution, states are granted control over multiple important aspects of the election of senators, representatives, president, and vice president.[87] In the case of the former two, the states have control over the time, place, and manner in which these elections are held.[88] The states also have broad authority to control the structure and procedures for administering these elections.[89] Still, the United States Constitution reserves the right for Congress to alter state election systems "at any time by Law . . . except as to the Places of choosing Senators."[90] The latter two elections—for the president and vice president—finds authority in the Twelfth Amendment, which outlines the process for such elections.[91] The Electoral College is the process by which these elections are determined.[92] The states do, however, retain control over how the members of the Electoral College are elected.[93] Again, Congress maintains a constitutionally reserved right to determine the time and day of general elections, which are required to be uniform across all fifty states.[94]

In a limited number of instances, Congress has utilized its authority under the Constitution to regulate the election systems in certain situations.[95] These situations have primarily been to remedy certain discriminatory practices that were still being implemented after the abolishment of slavery.[96] Further enactments, such as the National Voter Registration Act of 1993, have attempted to ease the process of registering to vote in America in an effort to increase voter participation.[97] Likewise, Congress has acted before to replace outdated voting systems[98] and assist overseas voters.[99] While these measures reflect Congress's

---

[86] Susskind, *supra* note 28, at 802–03; U.S. CONST. art. I, § 4; *id.* art. II, § 1.

[87] Susskind, *supra* note 28, at 802–03.

[88] *Id.* at 803.

[89] *Id.*

[90] *Id.*

[91] *Id.*

[92] *Id.*

[93] *Id.*

[94] *Id.*

[95] *Id.* at 803–04.

[96] *Id.*

[97] *Id.*

[98] *Id.* (citing Help America Vote Act of 2002, Pub. L. No. 107-252, 116 Stat. 1666 (codified as amended at 52 U.S.C. §§ 20901–21145)).

[99] Susskind, *supra* note 28, at 803–04.

willingness to take action to assist states in modernizing their voting systems, the "most important voting rights bill since the passing of the Voting Rights Act in 1965" was passed in 2002 and remains largely unchanged.[100]

The Help America Vote Act of 2002 (HAVA) made several changes to state-administered federal elections, including the grant of federal funds to states that modernize their voting equipment.[101] This is incredibly important, as technology has only continued to advance at increasingly faster paces.[102] While modernization is a primary goal of HAVA, states are also required to comply with several requirements.[103]

First, the system must permit the voter to privately and independently verify the selections the voter made before the ballot is cast as a vote.[104] Second, the voter must be provided with—again in a private and independent manner—the opportunity to change or correct any error in the ballot before it is cast and counted, including through a replacement ballot.[105] Third, if a voter selects more than one candidate for a single office, the voter must be notified before the ballot is cast, and provided the opportunity to correct the ballot.[106] Fourth, the system must also provide a record with audit capacity.[107] Fifth, accessibility must be provided for individuals with disabilities while maintaining privacy.[108] Sixth, alternative language accessibility must be supported on the system.[109] Seventh, the system must comply with error rates no greater than those issued by the Federal Election Commission on October 29, 2002.[110] And finally, each state must adopt uniform standards for what constitutes a vote and what will be counted as a vote in each voting system used in the state.[111]

Under HAVA, a "voting system" is defined to include "the total combination of mechanical, electromechanical, or electronic equipment (including the software, firmware, and documentation required to program, control, and support the equipment) that is used to define ballots, cast and count votes, report or display

---

[100] *Id.* (quoting 147 CONG. REC. H9290 (daily ed. Dec. 12, 2001) (statement of Rep. Lewis)).

[101] Susskind, *supra* note 28, at 804 (citing 52 U.S.C. § 20901(b)(1)(F)).

[102] DE FILIPPI & WRIGHT, *supra* note 18, at 156–58, 180 (discussing first Moore's law, and then the role that large mining pools have begun playing in blockchain ecosystems).

[103] *Id.*

[104] 52 U.S.C. § 21081(a)(1)(A)(i).

[105] *Id.* § 21081(a)(1)(A)(ii).

[106] *Id.* § 21081(a)(1)(A)(iii).

[107] *Id.* § 21081(a)(2).

[108] *Id.* § 21081(a)(3).

[109] *Id.* § 21081(a)(4).

[110] *Id.* § 21081(a)(5).

[111] *Id.* § 21081(a)(6).

election results, and to maintain and produce any audit trail information."[112] This also includes the practices and associated documentation used to test the system, maintain records of system errors and defects, and make information available to the voter.[113]

Notably, however, HAVA does not outline any specific voting systems that are recommended or even permitted.[114] Thus, new voting systems have flexibility but must comply with these existing standards and the definition of a "voting system" to be used in an election for federal office.[115] The Election Assistance Commission (EAC), established under HAVA, is an independent and bipartisan federal agency that provides voluntary voting system guidelines and testing for a national certification of the underlying hardware and software of voting systems.[116] In support of this, the EAC adopted the Voluntary Voting System Guidelines, originally a 228-page document, now with numerous additions, that provides a set of requirements to meet this certification.[117] Although generally voluntary, many states—including Wyoming[118]—require EAC certification.[119] Ensuring EAC compliance is thus a primary concern in proposing and implementing a new system.[120]

In addition to HAVA requirements, provisions of the Voting Rights Act of 1965 (VRA) are still important today.[121] Considering these before adopting a new voting system is therefore an important consideration.[122] Of prominence is the prohibition of minority vote dilution from Section 2 of the VRA.[123] This section of the VRA prohibits implementation of standards, practices, or procedures that result in a denial or abridgement of the right of any United States citizen to vote on account of race or color, or membership in a language minority group.[124] A violation may arise regardless of the intent of the state govern-

---

[112] *Id.* § 21081(b)(1).

[113] *Id.* § 21081(b)(2).

[114] *Id.* § 21081 (referencing, however, direct-recording electronic voting machines, known as DREs).

[115] *Id.*

[116] *Id.* § 20921-2.

[117] Susskind, *supra* note 28, at 805–06.

[118] WYO. CODE R. § 002-0005-12 (LexisNexis 2021).

[119] *Id.*

[120] *Id.*

[121] Susskind, *supra* note 28, at 806.

[122] *Id.*

[123] *Id.*

[124] *Id.*

ment.[125] Proving a violation only requires that the claimant shows that the challenged voting procedure—based on the totality of the circumstances—has a discriminatory effect.[126]

A facially neutral state voting standard, practice, or procedure may still be challenged under voting dilution grounds if there is a discriminatory effect on minority voters.[127] Thus, a new voting system in Wyoming must fit within the standards of HAVA, EAC, and the VRA.[128] Even considering these complications, a blockchain-enabled system as proposed in Part V provides promise to improve Wyoming's voting systems.

B. Wyoming Election Highlights

Elections are dealt with in Wyoming Statutes Title 22.[129] Certain statutes are directly relevant when considering implementing a blockchain-enabled system in the state.[130] One statute authorizes the board of county commissioners of each county to adopt or use "any electronic voting system authorized by law," a promising authorizing statute when considering the implementation of a blockchain-enabled voting system in Wyoming.[131] Another relevant statute is Wyoming Statute Section 22-2-121.[132] This statute not only authorizes the Secretary of State to issue directives and ensure compliance with how ballots are to be transmitted electronically to Uniformed and Overseas Citizens Absentee Voting Act (UOCAVA) voters,[133] but also provides authority for issuing directives and ensuring compliance "when there is a declared natural disaster or other impending or declared emergency which interferes with an election."[134]

The majority of Wyoming's Election Code deals with traditional in-person voting completed on physical ballots.[135] Similarly, Wyoming permits "any

---

[125] *Id.*

[126] *Id.*

[127] *Id.*

[128] *See supra* notes 61, 116, 118 and accompanying text.

[129] WYO. STAT. ANN. tit. 22.

[130] *See id.* tit. 22, ch. 11 (setting forth the requirements and procedures for implementing and utilizing electronic voting systems); WYO. STAT. ANN. § 22-1-102(a)(xiv) (2021) (defining "electronic voting system").

[131] *Id.* § 22-11-102.

[132] *Id.* § 22-2-121.

[133] *Id.* § 22-2-121(e)(ii).

[134] *Id.* § 22-2-121(f); *see* Mark Gordon, *Declaration of a State Emergency and a Public Health Emergency*, Exec. Order 2020-2, drive.google.com/file/d/19mX3feCje2NKRrKi_GPiKvwcckGVoVBh/view [https://perma.cc/EW2Z-X8MQ] (declaring an emergency that may have benefitted from having directives from the Secretary of State).

[135] *See generally* WYO. STAT. ANN. tit. 22.

qualified elector" to vote absentee through mail-in voting on physical ballots.[136] Thus, the possibility of implementing a blockchain-enabled voting system primarily without physical ballots would seem farfetched.[137] However, Part V of this Comment explores how this future may become a reality more easily than what first meets the eye.

C. Current Voting Measures

Currently, Wyoming utilizes paper ballots and automatic tabulating equipment that provides a paper record.[138] However, due mainly to the failure to carry out post-election audits, the State received a "C" grade by the Center for American Progress.[139] This failure is believed to leave the State open to undetected hacking and other issues on election day.[140] Wyoming also utilizes a controlled-access electronic voter registration system.[141] This system appears to meet many current industry standards for both prevention and detection of errors and intrusions.[142]

While all ballots are accounted for at the precinct level, counties are not explicitly required to compare and reconcile precinct totals with countywide composite results.[143] The State, to its credit, does require that vote tallies and ballot reconciliation information be made public.[144] Wyoming "did earn points" for disallowing UOCAVA voters to submit their ballots electronically—requiring submission of ballots by mail or by delivering them in person.[145] The blockchain-enabled system proposed in Part V of this Comment would permit electronically submitted ballots to undergo precinct and countywide reconciliation which would allow for an integrated and hierarchal system.[146]

---

[136] *Id.* § 22-9-101.

[137] *But see id.* § 22-11-104 (2021) (providing an exception to the physical ballot constraints).

[138] DANIELLE ROOT ET AL., ELECTION SECURITY IN ALL 50 STATES: DEFENDING AMERICA'S ELECTIONS, CTR. FOR AM. PROGRESS 194–96 (2018), cdn.americanprogress.org/content/uploads/2018/02/21105338/020118_ElectionSecurity-report11.pdf#page=197 [https://perma.cc/K34D-QS7D]; 2018 EAVS DATA BRIEF: WYOMING, ELECTION ASSISTANCE COMM'N (Dec. 17, 2020), www.eac.gov/sites/default/files/eac_assets/1/6/EAVS_2018_Data_Brief_WY.pdf [https://perma.cc/328Y-Q4RF].

[139] ROOT ET AL., *supra* note 138, at 194.

[140] *Id.*

[141] *Id.*

[142] *Id.*

[143] *Id.*

[144] *Id.*

[145] ROOT ET AL., *supra* note 138, at 194. *But see* WYO. STAT. ANN. § 22-9-109 (2021) (permitting UOCAVA ballots to be provided in an electronic format).

[146] Agnes Beatrice Gambill, *The Future of Voting Reform with Blockchain Technology*, 56 IDAHO L. REV. 167, 174 (2020). This "would foster electoral integrity and streamline electoral management in state and local government." *Id.*

Additionally, Wyoming has previously used and currently uses hardware and software from ES&S, the company that provides the majority of the voting systems throughout the country.[147] Removing such a centralized provider is one of the prime benefits of a blockchain-enabled system.[148] The decentralized nature of blockchain technology improves the security of the system by removing one central target to attack. ES&S is one central target, making a variety of attacks much simpler. While newer products from this provider utilize air-gap[149] security measures, they all come from one central source, perhaps a target of future election interference.[150]

Other than implementing new voting systems from ES&S, Wyoming made no significant changes to the primary election that took place on November 3, 2020 amidst a worldwide pandemic.[151] However, moving forward, implementing a blockchain-enabled system would allow voters to vote from home more easily during turbulent circumstances. Still, an apparent issue with Wyoming's current voting system appears to be the voter registration process.[152] Although Wyoming allows for same-day registration at the polls,[153] this policy might be a hold-up for implementing new, more efficient procedures for voters to register ahead of time.[154]

In a report from the Secretary of State, Wyoming received a significant sum of funding from the HAVA Grant Program to "improve the administration of elections for Federal office . . . ."[155] Nearly a third of this funding is being used to identify and address cyber vulnerabilities within the State's system.[156] Half of the grant is set aside for improving the voter registration system, specifically citing

---

[147] *Wyoming Chooses ES&S Paper-Based Technology*, *supra* note 26.

[148] *See generally* DE FILIPPI & WRIGHT, *supra* note 18.

[149] Sunoo Park et al., *Going From Bad to Worse: From Internet Voting to Blockchain Voting*, MIT at 6, n.13 (Nov. 6, 2020), people.csail.mit.edu/rivest/pubs/PSNR20.pdf [https://perma.cc/TB2K-EHXB] ("Air-gapping means maintaining a device disconnected from the Internet and from any internet-connected device.").

[150] *See Wyoming Chooses ES&S Paper-Based Technology*, *supra* note 26; Susskind, *supra* note 28, at 798–800.

[151] *Wyoming Takes Meek Steps to Increase Mail-in Voting in 2020. It Should Be Doing More.*, BETTER WYO. (June 10, 2020), betterwyo.org/2020/06/10/wyoming-takes-meek-steps-to-increase-mail-in-voting-in-2020-it-should-be-doing-more/ [https://perma.cc/3CF5-E3M5] [hereinafter *Wyoming Takes Meek Steps*].

[152] *Id.*; *see also* Susskind, *supra* note 28, at 805–06.

[153] WYO. STAT. ANN. § 22-3-104 (2021).

[154] *See Wyoming Takes Meek Steps*, *supra* note 151 (claiming that "in Wyoming, it's a pain in the ass to register to vote if you don't register at the polls").

[155] EDWARD A. BUCHANAN, 2020 HELP AMERICA VOTE ACT (HAVA) ELECTION SECURITY GRANT PROGRAM NARRATIVE WYOMING SECRETARY OF STATE 1, www.eac.gov/sites/default/files/paymentgrants/narrative2020/WY_20ES_Program_Narrative.pdf [https://perma.cc/W6D7-GZDE].

[156] *Id.*

data encryption and secure functionality[157]—both aspects of the system that a blockchain-enabled system could help to ensure.[158] Even if these current funds are not utilized in implementing a blockchain-enabled system, future funds should be considered for use in developing such a system.

IV. BLOCKCHAIN VOTING MEASURES

A. Current Blockchain Voting

Current blockchain-enabled voting measures have been seen in multiple markets in the United States: the city of Denver, Utah County, Utah, and the state of West Virginia among them.[159] The overseer and provider of these services has thus far been one company: Voatz.[160] The success of these "pilots" has been questionable.[161]

This system requires the voter to register as an absentee voter and choose to vote mobile on their application.[162] The Voatz system—the private system receiving the most spotlight in the arena—implements cellphone-enabled biometric authentication matched to government IDs, a methodology which is certainly appealing.[163] Once successfully registered to vote by mobile means, Voatz first requires users to scan an original government issued identification—a driver's license, state ID, or passport.[164] Voters also use the camera on their device to take a live snapshot of their face.[165] Then, either the facial recognition technology or the fingerprint reader on the voter's mobile device is used to link their identity from the identification provided, to that specific device.[166] The voter

---

[157] *Id.*

[158] *See generally* UNITED STATES PATENT APPLICATION PUBLICATION NO: US 2020/0258338 A1 (Aug. 13, 2020), patentimages.storage.googleapis.com/41/07/09/647d1fa20703ac/US20200258338A1.pdf [https://perma.cc/9E7W-DWZD] [hereinafter PATENT APPLICATION].

[159] VOATZ, *supra* note 10.

[160] *Id.*

[161] Matthew De Silva, *The FBI Is Investigating West Virginia's Blockchain-Based Midterm Elections*, QUARTZ (Oct. 9, 2019), qz.com/1574671/the-fbi-is-investigating-west-virginias-blockchain-based-midterm-elections/ [https://perma.cc/YS3T-KJC9].

[162] VOATZ, *supra* note 10 (click on "Menu"; then select "How It Works").

[163] Danny Nelson, *Overstock Touts Voatz Blockchain Voting App as Solution to US Election Fracas*, COINDESK (Oct. 30, 2020, 12:30 PM), www.coindesk.com/blockchain-voting-us-election-problems [https://perma.cc/TWC3-9H9A]; *see supra* note 10 (discussing using "smartphone security, remote identity verification, biometrics and blockchain" to secure votes).

[164] VOATZ, *supra* note 10.

[165] *Id.*

[166] *Id.*

may then simply submit their ballot electronically.[167] This submission reaches the election officials who are able to print the ballot selections to create a paper trail for an audit that can be used to check against the blockchain database that supports the system.[168]

Voatz maintains that all personally identifiable information—verified through a separate company—is immediately deleted.[169] However, Voatz has previously received negative feedback for storing voter's information on private servers.[170] This raises both privacy concerns in general and implicates issues regarding the HAVA standards.[171]

Regardless of the above concerns, this initial foray into blockchain-enabled voting in the United States is promising for those that may follow.[172] Evidencing not only an interest and a willingness to adopt a blockchain-enabled system, these initial use cases also provide guidance into potential issues to be addressed with future blockchain-enabled voting systems.[173] Facing backlash from two Massachusetts Institute of Technology (MIT) studies,[174] Voatz—or a similarly implemented private party system—is likely not the answer moving forward. Utilizing a platform that has been demonstrated to be susceptible to attacks is not the step forward in protecting the American vote. Likewise, widespread use of a single company's product hampers the decentralized benefit of the blockchain technology itself.

B. Hopefully Government-Led, Not Private

A government-led system may be a much more favorable option.[175] Meeting HAVA and EAC standards will be crucial in providing a workable blockchain-enabled solution to voting.[176] With state and federal funding to update voting system infrastructure, Wyoming could lead the wave in adopting a framework for such a system.[177] Already the home to blockchain acceptance and regulation, Wyoming could continue this dominance by establishing a superior voting

---

[167] *Id.*

[168] *Id.*

[169] *Id.*

[170] Specter et al., *supra* note 23, at 12–13.

[171] *See supra* Part III.

[172] *See* Wolfson, *supra* note 23.

[173] *See id.*

[174] *See generally* Specter et al., *supra* note 23; Park et al., *supra* note 149.

[175] *See generally* Susskind, *supra* note 28.

[176] *See supra* Part III.

[177] McClintock, *supra* note 73, at 40; Long, *supra* note 85.

system for its citizens.[178] Establishing a promising, practical, and sound solution would likely lead to adoption among other states, just as Wyoming has seen through LLCs as well as other blockchain measures.[179] Hopefully, this will lead to nationwide adoption of blockchain initiatives as well.

Having an integrated and government-backed solution could not only provide a further layer of trust and integrity, but also a sense of legitimacy that a private party system may lack.[180] With more—and direct—oversight by the administering government, the system could be subject to security clearances and greater transparency. With Congress already beginning to take note of the potential that blockchain provides,[181] such widespread and federally backed adoption may not be too far outside of the bounds of reality. Indeed, the United States Postal Service (USPS) has already received a provisional patent for implementing exactly this.[182]

C. What Does This Look Like?

Questions certainly still remain for what exactly such a system would look like but analyzing the USPS's approach may give light to a functional solution.[183]

Although different than the solution being implemented by Voatz, the USPS's provisional patent provides multiple likely "embodiments"[184] of the system envisioned by this Comment. The "summary"[185] of the patent provides a high-level discussion of a system utilizing the current security of the USPS and physically-mailed ballots, tied in with the security and verifiability of a blockchain-

---

[178] *See generally* Acheson, *supra* note 27; Gregory Barber, *The Newest Haven for Cryptocurrency Companies? Wyoming*, WIRED (June 13, 2019, 7:00 AM), www.wired.com/story/newest-haven-cryptocurrency-companies-wyoming/ [https://perma.cc/6Y5Y-XRZW].

[179] Long, *supra* note 85.

[180] *See generally* Norden & Beard, *supra* note 25.

[181] *See generally* PATENT APPLICATION, *supra* note 158.

[182] *Id.*

[183] *Id.* The patent itself has several prospective versions of a blockchain-enabled voting system.

[184] *See* 37 C.F.R. § 1.71 (2021); Specific Embodiment of Invention, 13A Fed. Proc. Forms § 52:94. The "embodiments" of a patent are likely manners of implementing the process, machine, manufacture, composition of matter, or improvement thereof. While the patent specification need not describe every embodiment, many patents include various embodiments.

[185] 37 C.F.R. § 1.73 ("A brief summary of the invention indicating its nature and substance, which may include a statement of the object of the invention, should precede the detailed description. Such summary should, when set forth, be commensurate with the invention as claimed and any object recited should be that of the invention as claimed.").

enabled system.[186] This federal approach likewise highlights the desirability of such a system for voters generally.[187]

The USPS patent outlines a blockchain-enabled voting system that would be supported by two separate databases, utilizing electronic signatures and coded ballots to enable mobile voting capability.[188] Such a system would ensure anonymity by separating the digital voter identification from the associated vote.[189] The envisioned system(s) would employ the "dependability and security" of the USPS to incorporate a blockchain-enabled voting system "to prevent tampering or modification of electronic voting results."[190]

The detailed description of the patent envisions using a blockchain-enabled system to "defeat fraud" through the "cryptographic functions" inherent in blockchain technology that "prevent bad actors from altering the blockchain."[191] Further, such a system would allow voters, election officials, and auditors to ensure that the votes were received and properly counted—one of the main benefits of a blockchain-enabled system.[192]

The mechanics of such a system vary slightly in each embodiment envisioned, but most relevant to this Comment is the embodiment which enables mobile voting. This patent proposes a system in which a template ballot would be created by an election official.[193] Voters wishing to vote with their mobile device would then be able to apply to a system that would allow them to request an absentee ballot and verify their identity.[194] The system would verify the identity of the voter and create a "pseudo-anonymous token in the form of a unique identifier that represents the voter."[195] A paper ballot is then generated with a form of computer or machine readable identifier that represents this unique token

---

[186] PATENT APPLICATION, *supra* note 158, at 32 ("Voters generally wish to be able to vote for elected officials or on other issues in a manner that is convenient and secure. Further, those holding elections wish to be able to ensure that election results have not been tampered with and that the results actually correspond to the votes that were cast. In some embodiments, a blockchain allows the tracking of the various types of necessary data in a way that is secure and allows others to easily confirm that data has not been altered.").

[187] *Id.*

[188] *See id.*

[189] *Id.*

[190] *Id.* at 33.

[191] *Id.* at 34.

[192] *Id.*

[193] *Id.* at 33.

[194] *Id.*

[195] *Id.*

while "obscuring the identification information of the voter."[196] This paper ballot is then mailed to the voter, and once received, the voter can use a mobile device or computer to scan the ballot with a camera.[197] Once scanned, the voter is able to cast a digital vote which is written onto the blockchain.[198]

Beyond this, such a system could have tremendous flexibility and room to adapt to specific considerations of each jurisdiction.[199] Some of these considerations could be how the voter registers, receives the ballot, and how the cast ballots are tabulated.[200] However, meeting HAVA and even EAC basics is crucial.[201]

D. Pros vs. Cons

While the broad realm of internet voting has received plenty of flack,[202] there has yet to be nearly as much discourse on blockchain-enabled voting systems specifically. Some of the benefits that are believed to be experienced would not only meet legal standards but improve on them.[203] With a system that could be more secure, mobile, transparent, and verifiable,[204] Wyoming has the opportunity to enhance its citizens' participation in their democracy. Although these benefits have certainly been disputed,[205] so too have each iteration of voting systems.[206] Although the attacks on democracy seem ever more constant, this only increases the need for change.[207]

A blockchain-enabled system could bring access to voting for those that traditional methods may not work for.[208] Further, supporting voting records on a blockchain system could lend credence to the election system through the

---

[196] *Id.* at 33, 39.

[197] *Id.* at 33.

[198] *Id.*

[199] *Id.*

[200] *Id.* at 33, 35–36, 44.

[201] *See supra* Part III.

[202] *E.g.*, Simons, *supra* note 31, at 544–48; Andrew W. Appel & Philip B. Stark, *Evidence-Based Elections: Create A Meaningful Paper Trail, Then Audit*, 4 GEO. L. TECH. REV. 523, 529 (2020).

[203] Susskind, s*upra* note 28, at 806–10.

[204] *See supra* Part II.

[205] *See generally* Simons, *supra* note 31, at 545–48, 552–57.

[206] *See* Daniel P. Tokaji, *The Paperless Chase: Electronic Voting and Democratic Values*, 73 FORDHAM L. REV. 1711, 1717–24 (2005) (providing a history of various voting mechanisms and issues that each has faced).

[207] SELECT COMMITTEE ON INTELLIGENCE, 116TH CONG., REPORT ON RUSSIAN ACTIVE MEASURES CAMPAIGNS AND INTERFERENCE IN THE 2016 U.S. ELECTION, at 3–5, 10, 54–66 (2019), www.intelligence.senate.gov/sites/default/files/documents/Report_Volume1.pdf [https://perma.cc/RQ5A-ZU8N].

[208] Susskind, *supra* note 28, at 808–10.

immutable nature of the blockchain.[209] Unlike the 2020 election year, a system implementing blockchain records could store and report voting counts much faster than the current hand-count system.[210] With an automatic tally that can be publicly disclosed after the fact, election officials will be able to simply add the digital votes to the votes cast otherwise.[211] As more and more votes are cast digitally, the overall process of counting ballots will become far easier. Such a system could be designed for ballot choices to be verified before the ballot is cast and designed to permit verification that the vote was recorded—both of which could be done by each voter.[212] Recording votes onto a blockchain allows for an easily accessible method for a voter to audit their respective vote.[213] Currently, once a voter casts a ballot, the voter must place their trust in the election system that that vote will be counted—and counted properly.[214]

Even critics are faced with having to explain away some of the benefits sought and promised by a blockchain-enabled system.[215] Perhaps the biggest benefit of a blockchain voting system is simply the fact that voters would not be voting solely on the current voting systems. Many of the systems used in the 2020 election cycle—including in Wyoming—appear to be deficient in some regards.[216] Issues have routinely arisen among current providers of voting systems, and the expensive machines are not frequently updated.[217] Allowing voters to utilize a blockchain-enabled system would permit voters to vote more easily while being assured of the security of doing so.[218]

However, not everybody is on board for implementing a blockchain-enabled voting system for governmental elections.[219] Even leading authorities in the

---

[209] *See* DE FILIPPI & WRIGHT, *supra* note 18, at 37–38; PATENT APPLICATION, *supra* note 158, at 32.

[210] Brianna Bogucki, *Buying Votes in the 21st Century: The Potential Use of Bitcoins and Blockchain Technology in Electronic Voting Reform*, 17 ASPER REV. INT'L BUS. & TRADE L. 59, 75 (2017).

[211] PATENT APPLICATION, *supra* note 158, at 32–34.

[212] *Id.*

[213] *Id.* at 34.

[214] Susskind, *supra* note 28, at 793–95.

[215] *See* Simons, *supra* note 31, at 550–55.

[216] *Which Voting Machines Are Used and How Are They Compromised?*, WYO. LIBERTY GRP. (Aug. 16, 2020), wyliberty.org/blog/election-security-standards/which-voting-machines-are-used-and-how-they-are-compromised [https://perma.cc/X3UU-B6FF].

[217] Simons, *supra* note 31, at 552; *see* Ben Popken, *Voting Machine Makers Face Questions from House Lawmakers — but More Remain*, NBCNEWS (Jan. 9, 2020, 12:12 PM), www.nbcnews.com/tech/security/voting-machine-makers-face-questions-house-lawmakers-more-remain-n1113181 [https://perma.cc/4DKZ-HJUM]; *Which Voting Machines Are Used and How Are They Compromised?*, *supra* note 216.

[218] PATENT APPLICATION, *supra* note 158, at 33.

[219] Simons, *supra* note 31, at 555–63.

area choose not to utilize or advocate for the use of blockchain-enabled voting systems.[220] Primary concerns of these experts include security,[221] legal concerns (double-voters, transparency, stolen votes),[222] and more tangible concerns such as energy use and cost.[223]

Some of the discussion spawned from an understanding of blockchain-enabled voting systems other than the one proposed by the USPS.[224] With the fear of Russian hackers bubbling near the surface of the public conscious,[225] meeting the "twin goals of anonymity and verifiability" are often questioned.[226] Although the ability for voters to verify that their votes were counted correctly is not required—as anonymity is[227]—this is one of the primary benefits of implementing a blockchain-enabled system.[228] Pairing current hacking concerns with concerns that may be spawned by a digital voting system, the ability for a voter to access the blockchain and verify that their vote has been properly counted is important.

Much of the concern for digital voting can be summarized by an old cartoon: "On the Internet, nobody knows you're a dog."[229] This line of thinking highlights the concern that a digital voting system would be accessible by anyone—regardless of their status as a voter or even a citizen. While the discussion on this base level concern is certainly valid, it appears to assume a system that lacks a sufficient form

---

[220] Lucas Mearian, *Why Blockchain-Based Voting Could Threaten Democracy*, COMPUTERWORLD (Aug. 12, 2019, 3:00 AM), www.computerworld.com/article/3430697/why-blockchain-could-be-a-threat-to-democracy.html [https://perma.cc/3BZ5-6ULT].

[221] *Id.*

[222] *See generally* Specter et al., *supra* note 23, at 1–2, 14–15; Park et al., *supra* note 149, at 1–3, 7.

[223] Temte, *supra* note 66, at 92 n.42.

[224] *See generally* Simons, *supra* note 31. This article discusses many different systems but does not delve into the end-to-end verifiability and registration methods that seem to be proposed in systems such as the USPS's. *See generally* PATENT APPLICATION, *supra* note 158. Such measures may ameliorate many critics concerns. *See* Park et al., *supra* note 149, at 9–10 (discussing how end-to-end verifiability may assist in overcoming many of the concerns in implementing a blockchain-enabled voting system).

[225] SELECT COMMITTEE ON INTELLIGENCE, *supra* note 207, *passim*.

[226] Simons, *supra* note 31, at 544 ("[T]he secret ballot makes it impossible for the voter to verify her ballot."). The note associated with this does recognize that some systems propose manners to address this, but asserts that nothing capable of such currently exists. *Id.* at n.2.

[227] *See supra* Part III.

[228] *See* PATENT APPLICATION, *supra* note 158, at 32.

[229] Simons, *supra* note 31, at 546 (citing a cartoon, by Peter Steiner, that was published in *The New Yorker* on July 5, 1993).

of registration. The proposed system's registration would likely include receiving a private key to empower the voter to digitally cast their vote, while ensuring voter-eligibility and preventing double-voter concerns.[230] Such a system could likewise address many of the security concerns as a permissioned blockchain limits participation to those verified, while providing a level of the decentralized, transparent security benefits of a blockchain.[231]

A permissioned—otherwise known as private—blockchain only permits authorized parties to view or add to the blockchain.[232] Such systems have a variety of permissions that may be granted or retained, and leaves a consortium of users in control of the blockchain.[233] This has been referred to as a "permission continuum" which permits many different permutations for various situations.[234] The blockchain-enabled voting system advocated for in this Comment would exist under a consortium of governmental bodies exercising appropriate control over the blockchain and only permitting voting access to those properly registered in a manner similar to that envisioned by the USPS patent.[235]

Critics have concerns about how a blockchain voting system would fit within the current voting laws and if a blockchain voting system could ever comply with these laws.[236] Questions about anonymity and accessibility reign supreme in this arena but might be met through various cryptographic methods, as addressed in Part II.

While concerns certainly abound, many seem to lack significant weight when addressed by choosing an appropriate system.[237] Although no system is without flaw or fail, a blockchain-enabled voting system may offer voters with substantially improved voting experiences and security.[238] Even the EAC has stated so before.[239]

---

[230] *See* PATENT APPLICATION, *supra* note 158, at 32.

[231] *Id.*

[232] Wilkinson & Capeling, *supra* note 48, at 66, 73–74.

[233] *Id.* at 74.

[234] *Id.*

[235] *See* PATENT APPLICATION, *supra* note 158, at 32–34.

[236] Park et al., *supra* note 149, at 4–5 (discussing various evidence-based requirements that an election system must entail).

[237] *See supra* note 224 and accompanying text.

[238] *See generally* Susskind, *supra* note 28.

[239] A SURVEY OF INTERNET VOTING, ELECTION ASSISTANCE COMM'N 45 (Sept. 14, 2011), www.eac.gov/sites/default/files/eac_assets/1/28/SIV-FINAL.pdf [https://perma.cc/753X-X65].

E. Examples of Voting Systems Using Blockchain Technology

As 2020 becomes more of a memory and less of a reality, there are more examples of blockchain-enabled voting systems being used both nationally and internationally.[240] While most of the United States has yet to implement such a system, a select few jurisdictions have begun testing these systems out.[241] A few steps ahead of the game, Estonia has been utilizing a form of blockchain-enabled voting since 2007.[242]

Estonia's system is unique in that it utilizes a PIN and personal sim card in order for an Estonian to be able to cast their vote.[243] This approach helps to ameliorate the concern with registration and non-citizen voters, but also complicates the process and leaves open the potential for another individual to utilize the same hardware to cast the original voter's ballot.[244] Other European countries have dipped their toes into the water, but most have either decided against implementing a blockchain-enabled system or are planning to wait for further developments.[245] One such example is the city of Naples, Italy.[246] After a brief foray into the new technology, concerns over voters being influenced or suppressed appear to have killed the project.[247]

Closer to home, Denver, Colorado has been toying with the idea of blockchain-enabled voting.[248] Testing out the Voatz system in its May 2019 election, the city officials behind the project were pleased with the outcome.[249] Still, this pilot project was fully funded by Tusk Philanthropies and only

---

[240] *See, e.g.*, Simons, *supra* note 31, at 548–50, 558–60.

[241] *See supra* Part IV.

[242] Simons, *supra* note 31, at 549–50.

[243] *E-Governance*, E-ESTONIA, e-estonia.com/solutions/e-governance/i-voting/ [https://perma.cc/P3UC-DFXC]; *see also* Sydney Lauren Abualy, Note, *"Estonia's Gift to the World": The Implementation of A Blockchain Protocol for Corporate Governance in New York*, 14 BROOK. J. CORP. FIN. & COM. L. 275, 277 (2020).

[244] *Electronic Voting with Blockchain: An Experience from Naples, Italy*, COINTELEGRAPH (Feb. 3, 2020), cointelegraph.com/news/electronic-voting-with-blockchain-an-experience-from-naples-italy [https://perma.cc/PN4P-TMNT] (discussing critical issues that the Estonian voting system had encountered).

[245] *See id.*

[246] *Id.*

[247] *Id.*

[248] *See supra* note 24 and accompanying text.

[249] *See* Jeanne Davant, *NCC Completes Audit for Denver's Mobile Voting Pilot*, THE COLO. SPRINGS BUS. J. (Aug. 5, 2019), www.csbj.com/news/daily/ncc-completes-audit-for-denver-s-mobile-voting-pilot/article_8195cc47-4479-5afa-8b98-075e46698e0b.html [https://perma.cc/W8DA-75RF].

implemented for UOCAVA voters.[250] Likewise, Utah County, Utah has attempted to join the early adopters in the blockchain-enabled voting sphere.[251]

Using the same company as Denver and West Virginia, the state of Utah has seemingly jumped ahead in the race to fully implement a blockchain-enabled voting system.[252] Furthermore, the federal government seems to be actively investigating and seeking to implement such systems.[253] With increasing attacks focused on governmental agencies and services, the federal government has a strong interest in working to protect the voice of the voters.[254] While a federal solution would be significant, Wyoming has the chance to direct how such a system would operate and be implemented.[255]

V. LEGAL ANALYSIS

To perform this legal analysis, this Comment incorporates various aspects of multiple systems, such as the USPS proposed system(s), those discussed by MIT, and portions of the Voatz system—systems which have been discussed above.[256] Starting with HAVA, it is clear that a blockchain-enabled system would be beneficial to implement.

The first HAVA requirement of private and independent verification of selections is an easy task for an electronic, blockchain-enabled system.[257] By providing a verification screen after the voter inputs their selections, such a system will be able to meet this requirement in much the same ways as current direct-recording electronic voting machines do.[258] With a mobile, electronic interface, voters will be able to review their selections before casting their ballot. The second requirement of HAVA requires that the voter must be provided with the opportunity to change or correct any error in the ballot before it is cast and counted,[259] which is likewise easily met.

---

[250] Andrew Kenney, *Denver Will Allow Smartphone Voting for Thousands of People (but Probably Not You)*, DENVER POST (Mar. 7, 2019, 1:18 PM), www.denverpost.com/2019/03/07/voting-smartphone-blockchain-denver/ [https://perma.cc/M37V-8S87]; *see Mobile Voting Project*, TUSK PHILANTHROPIES, mobilevoting.org/ (last visited Apr. 20, 2021) [https://perma.cc/RRV9-5CET].

[251] *See* VOATZ, *supra* note 10.

[252] *See* UTAH CODE ANN. § 20A-3a-201 (2020).

[253] *See generally* PATENT APPLICATION, *supra* note 158, *passim*.

[254] SELECT COMMITTEE ON INTELLIGENCE, *supra* note 207, *passim*.

[255] Long, *supra* note 85.

[256] *See supra* Part IV.

[257] Susskind, *supra* note 28, at 807–08.

[258] *Id.*

[259] 52 U.S.C. § 21081.

Providing the voter with an opportunity to change or correct an error in the ballot before it has been cast and counted is easier on an electronic system.[260] Rather than changing a paper-based selection—or completing a wholly new ballot—the electronic nature of the system could easily allow a pre-cast change.[261] This is similar to the third requirement presented by HAVA, ensuring that only one candidate is selected for each office.[262] If a voter has selected more than one candidate for a single office, the electronic system would easily be able to notify the voter before the voter casts their ballot—even preventing the voter from casting the ballot only one candidate is selected for each office—and allow for a correction.[263]

Each voter would also be able to audit their own vote.[264] However, this is not enough.[265] Any blockchain-enabled voting system would also be required to produce a "permanent paper record with a manual audit capacity," per the fourth requirement of HAVA.[266]

To satisfy the fifth requirement—requiring accessibility for individuals with disabilities while maintaining privacy—the system would need to have different technologically enabled methods of voting for those with disabilities.[267] Utilizing current accessibility settings and tools on electronic devices would satisfy this requirement, and likely be better than that which is already used.[268] Not only can a digital approach generally lend credence to accessibility,[269] but a system that can be utilized through voters' current accessibility-enabled technology may even assist these voters better than the current voting systems.[270] This similarly would be able to be utilized in complying with HAVA's sixth requirement, alternative language accessibility.[271] Again, a mobile-based voting system could quite easily implement alternative languages through the electronic platform.[272]

---

[260] Susskind, *supra* note 28, at 807–08.

[261] *Id.*

[262] 52 U.S.C. § 21081.

[263] *Id.*

[264] *Id.*

[265] *See id.* § 21081(a)(2).

[266] *Id.*

[267] Susskind, *supra* note 28, at 807–08.

[268] *See generally* VOATZ, *supra* note 10.

[269] *See* 52 U.S.C. § 21081(a)(3); Susskind, *supra* note 28, at 808.

[270] Susskind, *supra* note 28, at 808.

[271] *Id.*

[272] *See* VOATZ, *supra* note 10. While Voatz does not appear to expressly discuss supporting alternative language accessibility, the company does claim compliance with EAC Voluntary Voting System Guidelines (VVSG v1.1). *Id.* These guidelines make clear that such accessibility is a requirement under section 203 of the VRA. VOLUNTARY VOTING SYSTEM GUIDELINES, ELECTION ASSISTANCE COMM'N 4, 48–83 (2015), www.eac.gov/sites/default/files/eac_assets/1/28/VVSG%201.1%20VOL%201.508compliant.FINAL.pdf [https://perma.cc/8W53-4QT2].

The seventh HAVA requirement mandates that State-provided voting systems comply with error rates that are no greater than those issued by the Federal Election Commission.[273] This seventh requirement is an area which would likely be well improved by a blockchain-enabled voting system.[274] Utilizing a secure and advanced electronic system is expected to provide greater accuracy.[275]

Finally, the eighth requirement of HAVA would also be met by a blockchain-enabled system. This last requirement has charged States to adopt uniform standards for what constitutes a vote and what will be counted as a vote in each voting system used in the state.[276] Simple revisions—or at least clarifications—to existing voting laws would ensure ballots cast on a blockchain-enabled voting system meet a uniform standard.[277]

Wyoming's Election Code does not directly define what constitutes a "vote."[278] However, the EAC voluntary guidelines define a "valid vote" as being "from a ballot or ballot image that is legally acceptable according to state law."[279] In Wyoming, a "ballot" is defined as "the cardboard, paper or other material upon which a voter marks his votes."[280] Still, the definition of "electronic voting system" seems to permit recording, tabulating, and counting of non-physical votes.[281] Even still, the definition for a "voting device" is constrained to those devices or methods that record votes on ballots.[282] Therefore, while the proposed system might have some legal validity, clarifications should be made to include votes cast on an electronic ballot from a blockchain-enabled system.

Ensuring the "privacy of the voter and the confidentiality of the ballot"[283] becomes a more interesting discussion. While blockchains in general are known for near-anonymous interactions in many instances,[284] this is complicated to implement as a voting system considering the "twin goals of anonymity

---

[273] 52 U.S.C. § 21081; *see* Susskind, *supra* note 28, at 808–09.

[274] *See* Susskind, *supra* note 28, at 808–09.

[275] *Id.*

[276] 52 U.S.C. § 21081.

[277] *See supra* note 276 and *infra* notes 278–80 and accompanying text.

[278] *See* WYO. STAT. ANN. tit. 22; *id.* § 22-1-102 (2021).

[279] VOLUNTARY VOTING SYSTEM GUIDELINES, *supra* note 272, at A-19.

[280] WYO. STAT. ANN. § 22-1-102.

[281] *See id.* § 22-1-102(a)(xiv) (permitting "a system . . . with paper ballots or ballot cards, *or* other system of secret voting and automatic tabulating equipment for the recording, tabulating and counting of votes in an election") (emphasis added).

[282] *Id.* § 22-1-102(a)(xxxiv); *see also id.* § 22-1-102(a)(ii)–(iii).

[283] 52 U.S.C. § 21081(a)(1)(C).

[284] *See* NAKAMOTO, *supra* note 46.

and verifiability."[285] However, such systems can be possible.[286] Using several cryptographic methods, a blockchain-enabled voting system could be structured to ensure a secret ballot while simultaneously being verifiable to the voter.[287] Not only does this meet the general requirement of a secret ballot found throughout HAVA,[288] but it also promotes election confidence through voter verification.

Lastly, "the [VRA] 'must be considered before altering state voting systems.'"[289] As discussed in Part III, a violation of the VRA may arise regardless of intent, as long as the claimant shows that the altered standards, practices, or procedures result in a discriminatory effect.[290] Such a "claim could only be successful, however, if blockchain voting became the only voting system in America."[291] Like previous changes to existing voting standards, a blockchain-enabled system would be in addition to current voting systems and standards, not an immediate complete replacement.[292] Additionally, with the increase of internet access through both personal devices and free public institutions, a vote dilution claim would be difficult to sustain.[293]

VI. PROPOSAL

While the Wyoming Legislature should certainly work with the Task Force and the Coalition on any future legislation in the blockchain realm, special focus should be given to those who have begun developing and implementing such systems—especially in the neighboring states of Colorado and Utah.[294] However, both of these early adopters are utilizing the contentious Voatz platform.[295]

---

[285] Simons, *supra* note 31, at 544.

[286] Specter et al., *supra* note 23, at 3.

[287] *Id.*

[288] *See, e.g.*, 52 U.S.C. § 21081(a)(1)(A)(i)–(ii) (requiring that the first two HAVA requirements be provided in a "private and independent manner"); *id.* § 21081(a)(1)(C) ("The voting system shall ensure . . . the privacy of the voter and the confidentiality of the ballot.").

[289] Chelsey Gonzalez, *The Integrity of Elections in the United States: Protecting Voters from Suppression, Technology, and Pandemics*, 48 RUTGERS L. REV. 142, 163 (2021) (quoting Susskind, *supra* note 28).

[290] *See supra* Part III.

[291] Susskind, *supra* note 28, at 809 (citing Logan T. Mohs, Comment, *The Constitutionality and Legality of Internet Voting Post-Shelby County*, 13 DUKE L. & TECH. REV. 181, 194 (2015)).

[292] *Id.*

[293] *See id.* at 809–10.

[294] UTAH CODE ANN. § 20A-3a-201 (2020); COLO. REV. STAT. § 1-5.5-101 (2021).

[295] *See* VOATZ, *supra* note 10.

Monitoring other adopters will help to prevent avoidable errors, but these observations should be qualified with their use of Voatz.

To the extent that the current election laws do not prevent the adoption of a blockchain-enabled system, the Wyoming Legislature should declare a legislative finding that such a system may be adopted throughout the state.[296] Similarly, the Secretary of State should implement new regulations permitting the use of a blockchain-enabled voting system under the existing authorizing statute.[297] In the instances that current language may prevent successful adoption of such a system, the Wyoming Legislature should again work with the Task Force and the Coalition to implement industry-compliant and enforceable language.[298] A handful of statutes stand out as needing either clarification or expansion to be able to clearly authorize the use of a blockchain-enabled system.[299]

VII. CONCLUSION

Providing the Wyoming voting public with an accessible, secure, and electronic voting system enabled by a government-led blockchain will improve Wyoming's elections and allow for a functional democracy to continue even amidst another pandemic.[300] By meeting HAVA, EAC, and VRA standards, the system will comply with existing legal safeguards while surpassing current expectations that Americans have for present-day systems.[301] Enabling access to democracy through a blockchain-enabled system will renew a sense of trust through a trustless, secure system to perform elections on.[302]

Benefitting the public through an array of unexpected potential futures, a blockchain system could run an election through another worldwide pandemic,

---

[296] *See, e.g.*, WYO. STAT. ANN. § 22-1-102 (2021) (defining electronic voting systems in a manner that likely meets a blockchain-enabled system); *id.* § 22-11-103 (setting standards for electronic voting systems adopted for use in Wyoming); *id.* § 22-9-109 (allowing for reasonable reproductions of the prescribed absentee ballot forms for electronic ballots and the provision of electronic ballots to UOCAVA voters).

[297] *Id.* § 22-2-121(e)(ii).

[298] *See supra* Part II; *see* Preston J. Byrne, *The States Can't Blockchain*, COINDESK (Mar. 2, 2020, 10:57 AM), www.coindesk.com/the-states-cant-blockchain [https://perma.cc/FC2T-U95A].

[299] *E.g.*, WYO. STAT. ANN. § 22-3-117 (authorizing submission of registration information over email, a security faux pas); *id.* § 22-9-107 (requiring submission of absentee ballots in "required envelopes"); *id.* § 22-10-101 (discussing the criteria that a "voting machine" must meet without defining a voting machine).

[300] *See* Tevi Troy & Jeremy Epstein, *Blockchain and the Next Pandemic*, AM. PURPOSE (Nov. 11, 2020, 11:55 AM), www.americanpurpose.com/articles/blockchain-and-the-next-pandemic/ [https://perma.cc/XYY4-99XN].

[301] *See* Popken, *supra* note 217.

[302] *See* DE FILIPPI & WRIGHT, *supra* note 18, at 33–39.

while voters are absent or unable to complete traditional ballots, and potentially even through a nuclear attack.[303] If nothing else, a blockchain-enabled voting system will certainly strike up discussion around the dinner table during the holidays.[304]

[303] *See* Troy & Epstein, *supra* note 300; DE FILIPPI & WRIGHT, *supra* note 18, at 13. The Rand Corporation sought a computer technology capable of withstanding a nuclear catastrophe. *Id.* This led to the internet. *Id.* Blockchain functions in some similar ways to the internet and would likely survive such catastrophe as well due to its decentralized nature. *See id.* at 13, 22.

[304] Wolfson, *supra* note 16.