

Blockchain-Based Voting in the US and EU Constitutional Orders: A Digital Technology to Secure Democratic Values?

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The right to vote and participate in the political process is a quintessential feature of any democratic society. Systematic risks to the integrity of US elections and passive civic participation in the EU political process present fundamental threats to the constitutional aspirations and the democratic ideals connected to “We the People” in the US and “United in Diversity” in the EU. The existence of power imbalances, social inequalities and information asymmetries in electoral and political processes illustrate that both jurisdictions are in peril and in risk of democratic backsliding. Blockchain-based voting can transform existing electoral and political processes in the digital age. This raises the question whether blockchain-based voting can be utilised as a digital tool to enhance the democratic legitimacy of US and EU electoral and political systems. Accordingly, this article aims to examine the prospects and limits of blockchain technology to secure foundational democratic norms connected to the right to vote and civic participation at the heart of contemporary constitutionalism. It contends that the decentralised, immutable, accessible, transparent, and secure processes of blockchain technology have the potential to enhance the legitimacy of the US and EU constitutional orders, since blockchain-based voting can act as a forum for enhanced civic participation, public deliberation, and democratic contestation. Nevertheless, the article concludes that a number of important steps must be taken to fully realise the potential of blockchain-based voting in a manner that combats the risks associated with the technology, strengthens public confidence in electoral and political processes and secures a balanced system of governance in the US and the EU constitutional orders.

I. INTRODUCTION

This article explores the prospects and challenges of blockchain-based voting as a new form of digital democracy in the global “risk society” of the 21st century.¹ Blockchain

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¹ Satoshi Nakamoto is a pseudonymous individual or group of individuals credited with developing blockchain technology to maximise the potential of bitcoin in 2008: S Nakamoto, “Bitcoin: A Peer-to-Peer Electronic Cash System” (2008) Bitcoin <[bitcoin.org/bitcoin.pdf](https://bitcointalk.org/index.php?topic=411)> (last accessed 16 July 2019). The concept of risk society connotes the universal nature of risks, the uncertainty surrounding contemporary risks, and the power structures, processes and arrangements in place to respond to existing and emerging risks in contemporary societies: U Beck et al, *Risk Society: Towards a New Modernity*, Vol 17 (Sage 1992); U Beck, “Critical Theory of World Risk

technology can revolutionise voting and political processes in the digital age.² It has the potential to lead to transformative societal change, specifically in areas concerning risk regulation, citizen participation, and privacy.³ At its core, blockchain technology has the potential to fundamentally transform *who governs* and *how*.⁴ Its importance is further highlighted as it can significantly impact the balance between the exercise of public power and individual and political self-determination, profoundly shaping the way individuals interact.⁵

This innovative blockchain technology is expected to promote open and transparent governance by enhancing the accountability, integrity, traceability, and anonymity of digital communications.⁶ Thus, blockchain has general relevance and can be utilised in interactions where enhanced trust and the verification of information are essential elements to combat power imbalances, social inequalities, and information asymmetries.⁷ A significant amount of the discourse on blockchain concentrates on cryptocurrencies, market capitalism, health care, data protection, smart contracts, real estate, and intellectual property.⁸ While acknowledging the broad applicability of blockchain and its importance in such areas, the scope of this inquiry is limited to examining the prospects and limits of blockchain-based voting in future use cases, particularly in the US and EU systems of governance.

The US and the EU constitutional orders are in peril and risk of democratic backsliding.⁹ Such risks include systematic voting challenges that can impact the integrity of election outcomes in the US and comparatively low levels of civic participation in political processes in the EU. As section IV.3 and IV.4 show, these risks present fundamental threats to the democratic ideals of “We the People” in the US and “United in Diversity” in the EU. Accordingly, the core question this article explores is whether blockchain-based voting can secure foundational constitutional values and realise democratic ideals, while minimising risks in electoral and political processes that threaten to distort the balance within the US or the EU electoral and

Society: A Cosmopolitan Vision” (2009) 16 Constellations 3, available at <[doi.wiley.com/10.1111/j.1467-8675.2009.00534.x](https://doi.org/10.1111/j.1467-8675.2009.00534.x)>. Digital democracy can be described as the ongoing pursuit of democratic ideals and practices through “digital media in online and offline political communication”: JAGM van Dijk, “Digital democracy: vision and reality” in I Snellen and W van de Donk (eds), *Public Administration in the Information Age: Revisited*, 19 (IOS Press 2013) pp 49, 51.

² P Boucher, “What if Blockchain Technology Revolutionised Voting?” (2016) European Parliament Think Tank – Scientific Foresight Unit (STOA), European Parliamentary Research Service. September 2016.

³ G Zyskind and O Nathan, “Decentralizing Privacy: Using Blockchain to Protect Personal Data” (2015) IEEE Security and Privacy Workshops (SPW), 180.

⁴ A Wright and P De Filippi, “Decentralized Blockchain Technology and the Rise of Lex Cryptographia” (2015) <ssrn.com/abstract=2580664> (last accessed 16 July 2019) pp 1–8.

⁵ A Tapscott and D Tapscott, “How Blockchain is Changing Finance” (2017) 1(9) Harvard Business Review 1.

⁶ Z Zheng et al, “Blockchain Challenges and Opportunities: A Survey” (2016) 14(4) International Journal of Web and Grid Services 352.

⁷ M Peck, “Blockchain World – Do You Need a Blockchain? This Chart Will Tell You if the Technology Can Solve Your Problem” (2017) 54(10) IEEE Spectrum 38.

⁸ S Ølnes et al, “Blockchain in Government: Benefits and Implications of Distributed Ledger Technology for Information Sharing” (2017) 34(3) Government Information Quarterly 355; M Swan, *Blockchain: Blueprint for a New Economy* (O’Reilly Media 2015).

⁹ AZ Huq and T Ginsburg, “How to Lose a Constitutional Democracy” (2017) 65 UCLA Law Review 78.

political systems.¹⁰ This article contributes to the existing discourse by examining the potential for blockchain-based voting to minimise risks in electoral and political processes. It provides unique insights by applying elements of constitutionalism, political philosophy, and electoral governance to explore the potential of blockchain-based voting in a national constitutional order (the US) and a multilevel system of governance (the EU). As section V demonstrates, such analysis further elucidates the prospects and limits of blockchain-based voting in distinct systems of governance. This analysis does not focus on how to construct a viable blockchain-based voting apparatus or how such an apparatus should be operationalised, but the type of constitutional norms a blockchain-based voting infrastructure shall promote to secure legitimate electoral and political processes.

This article contends that blockchain-based voting has the potential to enhance the legitimacy of electoral and political processes in the US and the EU. The technology can shift electoral and political processes from those based on hierarchical control and command systems toward processes that include more heterarchical forms of governance, where citizens play an active role as guardians of electoral and political system, safeguarding constitutional values and promoting democratic ideals. Thus, blockchain can help regulate risks in decision-making processes by creating a traceable immutable audit trail that produces decentralised checks and balances.¹¹ Yet, at its current stage of development blockchain-based voting is not sufficiently mature to fully realise constitutional aspirations. Further research, greater funding, and new pilot projects are necessary before the technology can be seen as a viable solution to overcome existing risks in the US and the EU electoral and political systems.

The structure of the article proceeds in the following manner. Section II explains the fundamental nature of the right to vote and participate in political processes within any democratic society. Section III provides an overview of blockchain technology and existing use cases to provide concrete examples of the advantages and risks associated with the technology. Section IV traces core elements of the US and EU constitutional orders to illuminate commonalities and differences between the two systems. It also distinguishes between two distinct but complementary forms of democracy, representative and participatory. Finally, this section highlights systematic voting risks concerning voter suppression and manipulation of the vote in the US electoral system and passive civic participation in the EU political process. Section V of the analysis explores the prospects and limits of blockchain-based voting in US and EU electoral and political systems. It assesses whether the technology can act as a legitimacy tool to promote constitutional values and democratic ideals, while minimising existing risks in both jurisdictions, as well as those presented by the potential application of blockchain-based voting. This section examines the prospects

¹⁰ Debates over the constitutional nature of the EU are widespread. For the purposes of this work the EU is understood as a constitutional order. For different conceptions of constitutionalism in the EU see P Craig, "Constitutions, Constitutionalism, and the European Union" (2001) 7(2) *European Law Journal* 125; also see AJ Menéndez, "Three Conceptions of the European Constitution" in EO Eriksen and JE Fossum (eds), *Developing a Constitution for Europe* (Routledge 2004) p 127.

¹¹ P Noizat, "Blockchain Electronic Vote" in D Lee and K Chuen, *Handbook of Digital Currency* (Academic Press 2015) p 453.

and limits of blockchain by assessing existing use cases, including the 2018 mid-term elections in West Virginia and the EU Blockchain Observatory and Forum and the potential application of blockchain-based voting via the European Citizen's Initiative (ECI) before recommending a way forward that promotes a dialogue on blockchain. Section VI concludes the article by showing that innovative methods that promote research, funding, and foster more pilot projects are necessary to address existing risks in US and EU electoral and political processes. The next section begins by outlining constitutional values and democratic ideals necessary to legitimate contemporary social orders.

II. CONSTITUTIONAL VALUES: SECURING THE RIGHT TO VOTE AND SAFEGUARDING CIVIC PARTICIPATION

The right to vote and participate in the political process is a quintessential feature in any democratic society.¹² Universal and equal suffrage is not only a democratic ideal, but a fundamental constitutional value that enables citizens to actively participate in the political process.¹³ Accordingly, fair and free elections have been called a “prerequisite” of democracy, necessary to secure foundational constitutional values and international legal norms, including self-governance, equality, pluralism, freedom of expression, and individual and political self-determination.¹⁴ Such foundational constitutional values provide different avenues for democratic contestation and encourage citizens to articulate their own vision of the public good. These constitutional values provide citizens with the possibility to articulate their views on deeply contested political issues within a polity, where competing perspectives can be defended or criticised based on rational argumentation.¹⁵ For these reasons, the legitimacy of a contemporary constitutional order rests on its ability to realise such foundational constitutional values, promote democratic ideals, and achieve balanced governance.¹⁶

A balanced constitutional order demands that all actors are constrained, their powers limited, and each is bound by the rule of law.¹⁷ From this perspective, a legitimate constitutional order aims to achieve the public good by balancing a plurality of societal forces, values, and interests.¹⁸ It safeguards individual freedom by promoting

¹² A Keyssar, *The Right to Vote: The Contested History of Democracy in the United States* (Basic Books 2009) p 172.

¹³ The right to vote using a secret ballot and participate in public affairs is guaranteed through international human rights law: see International Covenant on Civil and Political Rights (ICCPR) (adopted 16 December 1966, entered into force 23 March 1976) 999 UNTS 171, Art 25.

¹⁴ J Elkit and P Svensson, “What Makes Elections Free and Fair”(1997) 8(3) *Journal of Democracy* 32.

¹⁵ J Habermas, “Constitutional Democracy: A Paradoxical Union of Contradictory Principles?” (2001) 29(6) *Political Theory* 766.

¹⁶ See Young, arguing that in the context of the US such constitutional values are both entrenched and outside the formal US written constitution: EA Young, “The Constitution Outside the Constitution” (2007) 117 *Yale Law Journal* 408.

¹⁷ A Stone Sweet, “Constitutionalism, Legal Pluralism, and International Regimes” (2009) 16(2) *Indiana Journal of Global Legal Studies* 621.

¹⁸ See Fishkin, illustrating how the right to vote is linked with a number of different principles, including majority rule, political participation and interest representation: J Fishkin, “Equal Citizenship and the Individual Right to Vote” (2011) 86 *Indiana Law Journal* 1297.

civic participation and avenues for democratic contestation in the different processes of governance.¹⁹ Furthermore, legitimate governance guarantees that decisions are taken in an open and transparent fashion and each actor must justify their actions and state reasons for public decisions to ensure those that exercise power are held to account.²⁰

Legitimate governance also demands that the right to vote is safeguarded by democratic institutions through different processes, including constitutional provisions, legislation, and judicial review. In addition, from a normative perspective, the right to vote, freedom of expression, and civic participation in the political process ought to be guaranteed at different levels of governance – international, regional, and (sub) national levels – through multi-actor and multi-level checks and balances.²¹ Consequently, electoral and political processes must be open, secure, verifiable, and protected through constitutional safeguards to ensure public trust. Accordingly, a legitimate constitutional order promotes systematic checks and balances to prevent any single actor or group from obtaining a dominant position and unilaterally controlling the political process.²² However, governments are traditionally responsible for ensuring the integrity of elections and have almost complete control of electoral processes. Leaving the political process solely in the hands of any actor – whether central authorities, public officials, or private entities – can have detrimental effects on voter trust, the veracity of electoral outcomes, and the legitimacy of electoral and political processes. For instance, the US electoral system is a paradigmatic example of a form of representative governance that rests on centralised command and control voting processes at the federal, state, and local level, where public officials exercise almost unilateral control of electoral processes, often at great distance from the people. In the EU, the risk of dominance in the political process largely comes from the potential for EU actors or particular member states to exercise dominating control over decision-making processes within its multilevel system of governance. Despite some form of checks and balances in electoral and political processes in both jurisdictions, power imbalances and information asymmetries between governments and citizens have historically led to profound social inequality and hierarchical power structures, often making it an arduous task to achieve non-dominating ideals.²³

The risks associated with traditional voting in contemporary electoral systems have the potential to diminish individual and political freedom. The cost of voting, the complexity of voting processes, arbitrary electoral outcomes, and the lack of systematic checks and balances – during different phases of the electoral process – can lead to significant

¹⁹ For debates concerning the viability of constitutional dialogue as a means to ensure legitimate governance see L Fisher, *Constitutional Dialogues: Interpretation as Political Process*, Vol 922 (Princeton University Press 2014); C Bateup, “The Dialogic Promise-Assessing the Normative Potential of Theories of Constitutional Dialogue” (2005) 71 Brooklyn Law Review 1109; R Karlheinz and H Schmitt, “Nine Second-Order National Elections – A Conceptual Framework for the Analysis of European Election Results” (1980) 8(1) European Journal of Political Research 3. For debates on democratic contestation see P Pettit, “Republican Freedom and Contestatory Democratization” in I Shapiro and C Hacker-Cordon (eds), *Democracy’s Value* (Cambridge University Press 1999) p 163.

²⁰ M Shapiro, “The Giving Reasons Requirement” (1992) University Chicago Legal Forum 179.

²¹ ICCPR, *supra*, note 13.

²² P Pettit, *Republicanism: A Theory of Freedom and Government* (Oxford University Press 1999).

²³ ML King Jr vividly shows the power imbalances between African Americans and the Government in his seminal work: see ML King Jr, “Letter from Birmingham Jail” (1992) 26 UC Davis Law Review 835.

economic, political, and legal barriers that suppress voter participation.²⁴ As a result of such challenges, fundamental questions are raised concerning whether traditional electoral and political processes are currently realising foundational constitutional values. A multitude of innovative instruments have been introduced that are designed to address such risks and strengthen the legitimacy of electoral and political processes by increasing civic participation and voter turnout in a manner that builds trust in public decision-making.

Digital voting (e-voting) is a vital element in the global movement toward digitalising democracy, for instance.²⁵ It is increasingly utilised as a tool to address legitimisation concerns and diminish risks in political processes across the globe.²⁶ E-voting is a mode of “democratic experimentalism” that encourages inventive forms of governance, but also includes significant risks that threaten to undermine democracy.²⁷ Such risks raise key challenges concerning how to guarantee open and secure elections, while maintaining voter anonymity, and resolving problems linked with the security of voting transactions. Blockchain-based voting is a digital tool that has the potential to counter the risks connected to traditional voting and conventional e-voting processes.²⁸

III. BLOCKCHAIN-BASED VOTING

Blockchain technology promises to secure a balanced constitutional order by promoting self-governance, enhancing civic participation, and controlling how electoral processes operate. Accordingly, proponents of blockchain-based voting contend that the technology minimises risks and realises foundational constitutional aspirations.²⁹ However, as subsequent sections show, the prospects of blockchain-based voting, though transformative, currently present a number of fundamental risks that limit its ability to act as a tool to legitimate governance.³⁰

²⁴ J Susskind, “Decrypting Democracy: Incentivizing Blockchain Voting Technology for an Improved Election System” (2017) 54 *San Diego Law Review* 785.

²⁵ H Mahrer and R Krimmer, “Towards the Enhancement of e-Democracy: Identifying the Notion of the ‘Middleman Paradox’” (2005) 15(1) *Information Systems Journal* 27.

²⁶ Countries such as Estonia and Switzerland have led a digital voting revolution. Estonia is considered the first country to have nation-wide e-voting: U Madise and T Martens, “E-voting in Estonia 2005. The First Practice of Country-wide Binding Internet Voting in the World” (2006) 86 *Electronic Voting*; TW Lauer, “The Risk of e-Voting” (2004) 2(3) *Electronic Journal of E-government* 177; D Phillips and H von Spakovsky, “Gauging the Risks of Internet Elections” (2001) 44(1) *Communications of the Association for Computing Machinery* 73.

²⁷ For a detailed discussion on democratic experimentalism see MC Dorf and CF Sabel, “A Constitution of Democratic Experimentalism” (1998) 98(2) *Columbia Law Review* 267. Inventive technology poses such risks and presents new challenges to the democratic process: R Hanifatunnisa and R Budi, “Blockchain Based e-voting Recording System Design” (2017) 11th *International Conference on Telecommunication Systems Services and Applications (TSSA) IEEE*, 1.

²⁸ A Ayed, “A Conceptual Secure Blockchain-based Electronic Voting System” (2017) 9(3) *International Journal of Network Security & Its Applications* 1.

²⁹ M Teogenes and A Gomes, “Blockchain Voting and its Effects on Election Transparency and Voter Confidence” *Proceedings of the 18th Annual international Conference on Digital Government Research, ACM*, 2017.

³⁰ J Yli-Huoma et al, “Where Is Current Research on Blockchain Technology? A Systematic Review” (2016) 11(10) *PLoS ONE* 1.

1. Blockchain technology: an overview

Blockchain technology is an innovative digital tool that fundamentally shapes how we track, store, and share data.³¹ The blockchain is a particular type of distributed ledger technology that is encrypted, decentralised, and immutable. It shares, stores, and distributes information digitally across a system of nodes (participants on a distributed network of computer servers called a blockchain network), where nodes collectively control and maintain data on a blockchain network, including a synchronised copy of the history of transactions on the network, without relying on a central authority or third-party intermediary to reach consensus on the validity of a block.³² Its capacity to track items of value, avoid alterations, achieve peer-to-peer consensus, and execute transactions without being controlled by third-party intermediaries – centralised authorities, banks, and regulators – is ground-breaking for citizen participation and distributed governance.³³ Proponents of the technology argue that blockchain enhances democratic legitimation, since the entire network can be monitored by a multitude of nodes.

As a decentralised and distributed ledger technology, blockchain is based on a peer-to-peer consensus network. The technology links timestamped lists of “blocks” with one another, once a consensus among nodes exists, verifying the authenticity of information on the block.³⁴ Blockchain technology tracks and stores the complete history of transactions and the sequences in which transactions occur on the blockchain network, creating an immutable audit trail that tracks and verifies transactions on the network.³⁵ A block can only be added when a consensus among nodes in the network is reached.³⁶

To guarantee a secure and immutable audit trail blockchain technology utilises cryptography to create a digital signature. Once a consensus is reached amongst the nodes that confirms the accuracy of the data, the data is encrypted on a block to secure the communication throughout the entirety of a transaction (ie end-to-end voting process).³⁷ This peer-to-peer consensus mechanism is an integral part of the blockchain. It is designed to guarantee the accuracy of the data stored and enhance trust in the information on the network by utilising a “proof of work” or “proof of stake” scheme where a multitude of nodes verify the validity of the block before a new block is added to the network and thus aims to ensure only legitimate transactions are on the blockchain network.³⁸ The data involving the different

³¹ *ibid.*

³² A node is a fundamental aspect of the blockchain, as it forms the structure on which blockchain operates: H Natarajan et al, “Distributed Ledger Technology (DLT) and blockchain. FinTech note; no 1” (Washington, DC, World Bank Group 2017); R Houben and A Snyers, “Cryptocurrencies and Blockchain: Legal Context and Implications for Financial Crime, Money Laundering and Tax Evasion” (European Parliament Study 2018) p 15.

³³ JW Michael et al, “Blockchain technology” (2018) *The Journal* 1, 7.

³⁴ Øines et al, *supra*, note 8.

³⁵ K Kirby et al, “Votebook: A Proposal for a Blockchain-based Electronic Voting System” *The Economist* (2016) <www.economist.com/sites/default/files/nyu.pdf> (last accessed 16 July 2019).

³⁶ *ibid.*

³⁷ Nakamoto, *supra*, note 1.

³⁸ C van der Elst and A Lafarre, “Blockchain and Smart Contracting for the Shareholder Community” (2018) European Corporate Governance Institute (ECGI) Law Working Paper No 412/2018 <ssrn.com/abstract=3219146> (last accessed 16 July 2019); Blockchain Based E-voting Recording System design, 2.

transactions are distributed and shared in a manner that is unalterable (without detection) across the different nodes in the blockchain. Ideally, any suspicious activity that involves an attempt to manipulate or alter the blockchain is detected and individual nodes are informed, which prevents any user from unilaterally modifying the block.³⁹

Blockchain comes in many different forms, but a general classification can be made based on two fundamental questions. Who has *access* to a blockchain network and who can *mine* (modify) transactions on the blockchain network? Private (permissioned) blockchains are run by a single specialist entity that is “the dominant trust”.⁴⁰ Under permissioned blockchain, any node needs permission to access or mine on the blockchain network. A public (permissionless) blockchain, on the other hand, such as Bitcoin, allows access and any network node the capacity to mine, alter transactions on a blockchain network, and thus be part of a consensus that verifies a block’s validity, without obtaining permission from any entity.⁴¹ In contrast to private blockchains, the sharing of information along public blockchains grants access to all – instead of selected nodes, which can diminish information asymmetries – since ideally anyone with internet access can be a node, operating as a network participant with access and mining capability on a blockchain network. The next section shows that a number of illustrative use cases highlight how blockchain-based voting exemplifies democratic experimentalism in the digital age.

2. Blockchain-based voting use cases

Blockchain technology has emerged as a digital tool designed to enhance the legitimacy of electoral, political, and collective decision-making processes across the globe.⁴² The implementation of some form of blockchain-based voting is now a reality in countries ranging from Sierra Leone to Switzerland, Japan to Colombia, and Russia to South Korea. For instance, innovative blockchain technology was “partially deployed” in the 2018 Sierra Leonean elections, where a private Swiss company, Agora, acted as an international observer, running its own unofficial trial election test.⁴³ In Switzerland, the city of Zug used blockchain technology as part of an e-voting initiative.⁴⁴ Blockchain technology was also utilised as an innovative solution to overcome the limits of traditional voting in Colombia in the 2016 Peace Plebiscite, as

³⁹ Nakamoto, *supra*, note 1.

⁴⁰ Hanifatunnisa and Budi, *supra*, note 27.

⁴¹ *ibid*; van der Elst and Lafarre, *supra*, note 38; Houben and Snyers, *supra*, note 32, pp 15–20; Natarajan et al, *supra*, note 32.

⁴² X Xiwei et al, “A Taxonomy of Blockchain-based systems for Architecture Design” (2017) IEEE International Conference on Software Architecture 243.

⁴³ Agora was officially accredited to cover 280 polling locations in Sierra Leone by the National Electoral Commission. In order to clarify uncertainties concerning its role in the Sierra Leone election and the role of blockchain technology in the Sierra Leone election Agora released an Official Statement Regarding Sierra Leone election: see <medium.com/agorablockchain/agora-official-statement-regarding-sierra-leone-election-7730d2d9de4e>.

⁴⁴ The e-voting platform was developed by a private company, Luxoft, and the Department of Computer Science at Lucerne University of Applied Sciences. The Official Press Release is in German: <www.wallstreethodl.com/blockchain-based-voting-in-zug/>.

part of the nation's transitional justice process.⁴⁵ Challenging traditional voting processes that only provided for a limited number of expatriates to participate in a "symbolic" vote on the Colombian Peace Treaty, the technology was designed to strengthen public confidence and create an inclusive voting process that allowed more expatriates to participate in the symbolic vote.⁴⁶ In addition to the application of blockchain-based voting in electoral and transitional justice processes, the technology is also utilised in collective decision-making processes concerning community projects. A number of pilot projects designed to implement blockchain-based voting have also been introduced in the province of Gyeonggi-do, South Korea and the Russian capital city, Moscow.⁴⁷ Meanwhile, Estonia has developed an e-Residency program using blockchain technology to further empower individuals, allowing them to verify digitally encrypted documents, including contracts.⁴⁸

This section has introduced several blockchain-based voting use cases. Such use cases demonstrate the great promise blockchain offers, but as sections V.1 and V.2 show, a number of important risks connected with the technology limit the potential application of blockchain-based voting. Before examining the risk associated with blockchain based-voting it is necessary to trace core themes of the US and EU systems of governance, elucidating the commonalities and differences between the two systems.

IV. CONSTITUTIONAL ASPIRATIONS IN THE US AND EU

The US and the EU are two of the largest democratic systems of governance in the world.⁴⁹ Both systems play a prominent role establishing constitutional norms and democratic ideals at the national and international level. Nevertheless, profound differences exist between the two systems, with the former being a nation state and the latter a supranational multilevel system of governance operating within and beyond the state.⁵⁰ For the purposes of this analysis, a succinct outline of key distinctions between the two systems suffices.

⁴⁵ According to the OECD report "only 599,026 of the 6 million Colombians living abroad" could vote through traditional methods at the consulate as they had voted in previous elections: C van Ooijen, *How Blockchain Can Change Voting: The Colombian Peace Plebiscite. Case Study From the 2017 OECD Report: Embracing Innovation in Government* <www.oecd-forum.org/users/76644-charlotte-van-ooijen/posts/28703-how-blockchain-can-change-voting-the-colombian-peace-plebiscite>.

⁴⁶ The official plebiscite question was posed in the following manner: "do you agree with the agreement to end the conflict and build lasting peace?": *ibid*.

⁴⁷ N Kshetri and J Voas, "Blockchain-Enabled E-Voting" (2008) 35(4) IEEE Software 95, available at <ieeexplore.ieee.org/document/8405627/citations?tabFilter=papers#citations>.

⁴⁸ See <www.investinblockchain.com/estonia-blockchain-model/>.

⁴⁹ For an analysis comparing how the US Supreme Court and the Court of Justice of the European Union (then ECJ) attempt to secure constitutional norms within their respective jurisdictions through constitutional review see M Rosenfeld, "Comparing Constitutional Review by the European Court of Justice and the US Supreme Court" (2006) 4(4) International Journal of Constitutional Law 618.

⁵⁰ An exhaustive account of the two systems is beyond the scope of this article. For a comparative analysis outlining the similarities and differences between the two jurisdictions from a federalist perspective, see K Nicolaidis, "Conclusion: The Federal Vision Beyond the Federal State" in *The Federal Vision: Legitimacy and Levels of Governance in the United States and the European Union* (2001) p 439.

1. The US and the EU systems of governance

The US is a national constitutional order.⁵¹ It is a federal republic, a presidential system of governance, based on democratic self-rule, representative governance, checks and balances, separation of powers, federalism, a bill of rights safeguarding individual and minority rights, and strong judicial review exercised by its courts including the highest court of the land, the US Supreme Court.⁵² In contrast to the US system, ongoing contestation concerning the constitutional nature of the EU has occurred since the inception of the European integration process in the 1950s.⁵³

The EU is a multilevel system of governance comprised of 28 member states, operating both within and beyond the nation state.⁵⁴ Although the EU is not a nation-state and arguably does not possess all the characteristics of a fully-fledged democratic system, it embodies core features of a constitutional order and as a result is now often referred to as a form of “multilevel constitutionalism”.⁵⁵ This multilevel system of governance is based on its desire to achieve foundational “constitutional values”, such as promoting democratic governance through representative and participatory methods, safeguarding individual and collective fundamental rights, adherence to the rule of law, limited and divided government, and the principle of institutional balance, primacy, and subsidiarity.⁵⁶

Despite these fundamental differences, it is important to note that both systems strive to achieve constitutional aspirations – free and fair elections and active civic participation – linked with contemporary notions of legitimate democratic governance. Both systems embody jurisdictions that face fundamental legitimacy questions, where public confidence is eroding as citizens expectations for free and fair elections and vibrant political debate in deliberative fora are often unrealised.⁵⁷ This underpins the perception that governments in both jurisdictions often fail to achieve democratic ideals.

2. Representative and participatory democracy

The examination of the potential application of blockchain-based voting in the US and the EU systems of governance provides the framework to explore how the technology can

⁵¹ “We the People of the United States, in Order to form a more perfect Union, establish Justice insure domestic Tranquility, provide for the common defence, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the Union States of America”: see US Const, Preamble.

⁵² A Amar, “The Bill of Rights as a Constitution” (1991) Yale Law Journal 1131.

⁵³ J Habermas, “Why Europe Needs a Constitution” in *Developing a Constitution for Europe* (Routledge 2004) p 34; A Moravcsik, “What Can We Learn From the Collapse of the European Constitutional Project?” (2006) 47(2) *Politische Vierteljahresschrift* 219.

⁵⁴ As debates concerning Brexit highlight, member states within the EU are allowed to withdraw from the Union. At the time of writing this article, Brexit debates are still unresolved: see Art 50 TEU.

⁵⁵ I Pernice, “Multilevel Constitutionalism in the European Union” (2002) 27(1) *European Law Review* 511; P Popelier, “Europe Clauses” and Constitutional Strategies in Face of Multi-Level Governance” (2014) 21(2) *Maastricht Journal of European and Comparative Law* 300.

⁵⁶ Art 2 TEU, Art 10 TEU, Art 11 TEU. Though not explicitly mentioned in the treaties, Art 13.2 is often considered the legal basis of the institutional balance. D Johnson, “Institutional Balance as Constitutional Dialogue A Republican Paradigm for the EU” in M Derlén and J Lindholm (eds), *The Court of Justice of the European Union: Multidisciplinary Perspectives* (Hart Publishing 2018) p 115.

⁵⁷ K Nicolaïdis, “European Democracy and Its Crisis” (2013) 51(2) *Journal of Common Market Studies* 351.

shape two complementary, but distinct forms of democracy, representative and participatory.⁵⁸ Representative democracy is based on consent of the governed and equal citizenship for all.⁵⁹ It connotes a system of indirect governance where “the people” elect representatives that reflect different societal interests and who govern on behalf of the public good.⁶⁰ It is linked to the idea of a governmental system that demands “fair and free” elections and consists of a set of (elected) officials and institutions that reflect the will of the people and govern a society utilising top-down processes (laws, rules, and norms).⁶¹

Participatory democracy is seen as a way to complement and strengthen shortcomings in representative governance. It is a form of governance that concentrates on promoting citizen engagement through a diverse set of deliberative processes, institutions, and norms.⁶² Essential aims within participatory governance include citizen empowerment and community capacity-building by utilising decentralised decision-making processes, establishing avenues for constitutional dialogues between an array of public officials, civil society, and the citizenry, and ensuring more transparent and accountable decision-making processes.⁶³

Assessing the potential application of blockchain-based voting provides key insights concerning whether the technology can be used as a digital tool to reshape representative forms of governance in a manner that enhances the legitimacy of the US electoral system. Meanwhile, the analysis exploring whether the application of blockchain-based voting in the EU, as a form of participatory democracy, provides insights concerning whether the technology can act as a digital tool to shift the EU from passive civic participation to a system of governance with active civic engagement. This leads to the next section, which elucidates the historical context of the struggle to secure the right to vote for all in the US electoral system, while illustrating that universal suffrage and the right to participate in the US constitutional order remains deeply contentious, as systematic risks remain.⁶⁴

3. Systematic voting risks in the US: threatening the ideals of “We the People”

Since the birth of the nation, the exclusion of large segments of American society – including women, African Americans, Native Americans, Hispanics, Asians, and those with low socio-economic status – from certain constitutional guarantees, left a significant percentage of the population disenfranchised.⁶⁵ As the right to vote

⁵⁸ B Wampler, “Participation, Representation, and Social Justice: Using Participatory Governance to Transform Representative Democracy” (2012) 44(4) *Polity* 668.

⁵⁹ G Kateb, “The Moral Distinctiveness of Representative Democracy” (1981) 91(3) *Ethics* 357.

⁶⁰ J Madison, “Federalist No 10” (22 November 1787); G O’Donell, “Delegative Democracy” (1994) 5(1) *Journal of Democracy* 55.

⁶¹ E Sørensen and J Torfing, “The Democratic Anchorage of Governance Networks” (2005) 28(3) *Scandinavian Political Studies* 195.

⁶² F Fischer, “Participatory Governance: From Theory to Practice” in *The Oxford Handbook of Governance* (2012) p 457.

⁶³ *ibid.*

⁶⁴ A Berman, *Give Us the Ballot: The Modern Struggle for Voting Rights in America* (Macmillan 2015).

⁶⁵ See Justice Marshall arguing that “We the People” explicated by the framers of the US Constitution did not reflect the realities of America then or now, as it was reserved for only “free persons”. As Marshall expounds, “on a matter so

expanded to different segments of American society over time, the creation of ominous methods used to eliminate the ability for certain groups to participate in the political process, including the poll tax and literacy test, became commonplace in states across the US.⁶⁶

The right to vote is now a constitutional guarantee that is the bedrock of the American political system. Since the post-World War II Human Rights movement in the 1940s, 50s and 60s, where disparate groups of disenfranchised citizens in the US vigorously fought for their constitutionally guaranteed rights, systematic changes were put in place to promote free and fair elections that secure the right to vote for all.⁶⁷ Legal guarantees in the US and state constitutions, federal and state legislation, and judicial decisions now prohibit explicit discriminatory practices.⁶⁸ For instance, the US has a multilevel electoral system with actors at the federal, state, and local level playing a fundamental role in the creation and implementation of voting rules and the monitoring of elections.⁶⁹ At the federal level, two key legislative acts governing voting laws in the US are a product of transformative developments.⁷⁰ The first, the Voting Rights Act of 1965 is a product of the Human Rights movement of the 1960s. The second, the Help America Vote Act of 2002 was a result of the intensely debated 2000 Presidential election between then Texas Governor George W Bush and Vice President Al Gore. Each legislative act introduced vital measures that aimed to guarantee free and fair elections. Despite such legal guarantees, ongoing and systematic efforts to (re)shape the electorate have the potential to alter electoral outcomes and potentially interfere with the constitutional guaranteed right to vote.⁷¹

Today, debates over the right to vote in the US concentrate on two strands. Each strand presents significant risks to the integrity of the US electoral system. According to the first, voter suppression and gerrymandering occurs systematically in national, state, and local elections, which undermine constitutional norms designed to protect the right to vote for all and disproportionately disenfranchise and alienate certain groups of voters – racial and ethnic minorities as well as those with a lower socio-economic status.⁷² The second claim

basic as the right to vote, for example, Negro slaves were excluded, although they were counted for representational purposes – at three-fifths each. Women did not gain the right to vote for over a hundred years”. Such omissions were, in Marshall’s words, “intentional”: T Marshall, “Reflections on the Bicentennial of the United States Constitution” (1987) 101(1) *Harvard Law Review* 1. For an analysis on women’s suffrage and its link to other suffrage movement, see Keyssar, *supra*, note 12; K Lanning, “Democracy, Voting, and Disenfranchisement in the United States: A Social Psychological Perspective” (2008) 64(3) *Journal of Social Issues* 431.

⁶⁶ See A Ellis, “The Cost of the Vote: Poll Taxes, Voter Identification Laws, and the Price of Democracy” (2008) 86 *Denver University Law Review* 1024.

⁶⁷ See US Const. amend. (XV); US Const. amend. (XIX); US Const. amend. (XXVI).

⁶⁸ *Ibid.*; PM Shane, “Voting Rights and the ‘Statutory Constitution’” (1993) 56 *Law and Contemporary Problems* 243.

⁶⁹ US Constitution, Art 1, § 4; Art II, § 1; WWJ Brennan, Jr, “State Constitutions and the Protection of Individual Rights” (1977) 90(3) *Harvard Law Review* 489.

⁷⁰ Voting Rights Act of 1965, Pub L 89-110, 79 Stat 437 (1965); The Help America Vote Act of 2002, Pub L 107-252, 116 Stat 166 (2002).

⁷¹ KG Bentele and EE O’Brien, “Jim Crow 2.0?: Why States Consider and Adopt Restrictive Voter Access Policies” (2013) 11(4) *Perspectives on Politics* 1088.

⁷² The US Supreme Court has rejected claims that drawing boundary lines in state electoral districts are a political question and thus outside its domain, signifying its authority to ensure state legislatures are adhering to constitutional requirements linked with the equal protection clause under Art 14 of the US Constitution: see *Baker v Carr*, 369 US 186 (1962). “One person, one vote” is a constitutional principle designed to guarantee an egalitarian voting system where

rests on the argument that a significant degree of voter manipulation (fraud, hacking, and interference) occurs in US elections that potentially shape electoral outcomes.⁷³

US elections in 2000, 2016, and 2018 vividly illustrate how complex voting procedures, voter irregularities, voter suppression, voter identification laws, and allegations of voter manipulation create uncertainty over electoral outcomes.⁷⁴ The abovementioned 2000 US Presidential election marked a turning point in public confidence in the US electoral system.⁷⁵ The US Supreme Court eventually decided the outcome in the profoundly contentious *Bush v Gore* decision.⁷⁶ The Court's decision ended the Florida manual recount, holding that the lack of clear uniform standards to govern the recount was a violation of the equal protection clause of the 14th Amendment of the US Constitution. As a result of the Court's decision, Bush eventually won the Presidency.⁷⁷

The 2016 and 2018 elections intensified political distrust and vividly displayed significant legitimacy concerns involving the US electoral system.⁷⁸ For the second time, in four elections, the Presidential candidate that won the popular vote lost the electoral college and the Presidency. Investigations into Russian interference in the 2016 Presidential elections further elucidates concerns over the integrity of US elections.⁷⁹ Importantly, claims of widespread voter suppression efforts and allegations of voter manipulation also eroded public trust in the electoral system in 2016 and 2018.⁸⁰

Fiercely contested outcomes in recent elections reinforce concerns over the integrity of the US electoral system.⁸¹ Despite constitutional protections, recent developments show that a multitude of new legal and extra-legal barriers are now in place in states across the US that potentially discourage voter turnout and decrease the number of citizens that participate in the political process.⁸² For instance, several states have established new voting rules that have eliminated same-day voter registration, purged voters from voter registration lists, or

each person's vote counted the same amount as any other individual: *Reynolds v Simms*, US 533 (1964); Z Hajnal et al, "Voter Identification Laws and the Suppression of Minority Votes" (2017) 79(2) *The Journal of Politics* 363.

⁷³ Thus far, the allegations of systematic voter fraud in recent federal and state elections have gone largely unsubstantiated: D Schultz, "Less than Fundamental: The Myth of Voter Fraud and the Coming of the Second Great Disenfranchisement" (2007) 34 *William Mitchell Law Review* 483.

⁷⁴ S Bowler and T Donovan, "A Partisan Model of Electoral Reform: Voter Identification Laws and Confidence in State Elections" (2016) 16(3) *State Politics & Policy Quarterly* 340.

⁷⁵ *Bush v Gore*, 531 US 98 (2000).

⁷⁶ *ibid.*

⁷⁷ The profound contestation and large degree of media attention surrounding the US Supreme Court decision in *Bush v Gore* and the outcome of the Presidential elections have had lasting impact on the legitimacy of the US electoral system: E Chemerinsky, "Bush v Gore Was Not Justiciable" (2001) 76 *Notre Dame Law Review* 1093.

⁷⁸ H Allcott and M Gentzkow, "Social Media and Fake News in the 2016 Election" (2017) 31(2) *Journal of Economic Perspectives* 221.

⁷⁹ The Mueller Report highlights risks concerning voter manipulation in the 2016 Presidential election and deep concerns over the possibility of foreign interference or hacking of elections in the US electoral system: R Mueller, "Report on the Investigation into Russian Interference in the 2016 Presidential election" (US Department of Justice) Vol 1, 1–5; N Inkster, "Information Warfare and the US Presidential Election" (2016) 58(5) *Survival* 23.

⁸⁰ R Sobel, "Voter-ID Issues in Politics and Political Science: Editor's Introduction" (2009) 42(1) *Political Science & Politics* 81.

⁸¹ The 2000 and 2016 Presidential elections and the 2018 midterm elections are particularly illustrative.

⁸² Hajnal et al, *supra*, note 72.

significantly cut the time period allowed for early voting.⁸³ Recently enacted voting rules can intensify existing risks in the system that include the complexity of voting rules, the cost of voting, the limited hours of in-person voting, outdated voting machines, voter registration problems, challenges with mail-in voting, delays in counting ballots and the potential for administrative errors that invalidate or – perhaps even worse – indicate a vote for a candidate other than the one the voter intended.⁸⁴ Courts operating at both the federal and state level are also increasingly asked to minimise voting risks and settle legal questions concerning voter suppression and partisan gerrymandering. An illustrative example is the monumental decision in 2013, *Shelby County v Holder*, where the US Supreme Court rolled back voter protection safeguards in the 1965 Voting Rights Act.⁸⁵

This section shows that the US electoral system faces a legitimisation crisis.⁸⁶ It highlights systematic risks – complexity, accessibility, inclusiveness, equality, anonymity, arbitrariness, and accountability – in the existing US system.⁸⁷ In addition to vigorously contested elections, a number of measures have been introduced that ultimately shape the composition of the electorate and potentially electoral outcomes, while adding to the complexity, uncertainty, and opaque nature of the US electoral system.⁸⁸ The existing risks in the electoral system highlight questions concerning the control of voting processes, for instance, who controls voter registration, the operation of voting machines, and who controls how votes are counted (including post-election auditing). These risks can infringe fundamental constitutional principles and decrease public confidence in the integrity of elections.⁸⁹ To effectively protect constitutional norms, different levels of US governance must respond to efforts to shape voting outcomes through a strategy of voter suppression or voter manipulation. Importantly, the legitimacy of voting processes demands more than the efficacy of government institutions, but a vigilant effort by citizens and civil society to safeguard the right to vote for all.

⁸³ State law in North Carolina and Texas are among the most illuminating examples of strict voter identification laws: see R Hasen, “Race or Party: How Courts should Think about Republican Efforts to Make it Harder to Vote in North Carolina and Elsewhere” (2013) 127 Harvard Law Review 58.

⁸⁴ Mail-in voting presents the risk that voters may change their mind between the time of their mail-in vote and election day, yet since the vote has been cast their vote is locked: see J Susskind, “Decrypting Democracy: Incentivizing Blockchain Voting Technology for an Improved Election System” (2017) 54 San Diego L Rev 785.

⁸⁵ Section 4 (b) and Section 5 of the 1965 Voting Rights Act were particularly contested in *Shelby*. The *Shelby* decision makes it significantly more difficult to challenge state electoral processes that include closing polling places that are predominately utilised by certain communities and thus adversely affect voter turnout. The decision illuminates continued concerns over the integrity of elections: see J Blacksher and L Guinier, “Free at Last: Rejecting Equal Sovereignty and Restoring the Constitutional Right to Vote *Shelby County v. Holder*” (2014) 8 Harvard Law and Policy Review 39; *Dred Scott v Sandford*, 60 US 393 (1856).

⁸⁶ L Norden and C Famighetti, “America’s Voting Machines at Risk” (2015) Brennan Center for Justice at New York University School of Law.

⁸⁷ Boucher, *supra*, note 2.

⁸⁸ WD Hicks et al, “A Principle or a Strategy? Voter Identification Laws and Partisan Competition in the American States” (2015) 68(1) Political Research Quarterly 18.

⁸⁹ For an analysis of the impact of the *Bush v Gore* decision on the US Supreme Court’s legitimacy see J Gibson et al, “The Supreme Court and the US Presidential Election of 2000: Wounds, Self-inflicted or Otherwise?” (2003) 33(4) British Journal of Political Science 535.

The analysis, thus far, has illustrated how systematic risks within the US electoral system can undermine constitutional aspirations linked to the democratic ideals of “We the People”. The article now shifts focus to explore legitimation debates at the heart of the EU political system.

4. Passive civic participation in the EU: a systemic risk to the ideals of “united in diversity”

Since the inception of the European integration process in the 1950s, the transformation from 6 to 28 member states fundamentally shapes how public power in the EU is exercised, limited, and balanced.⁹⁰ An underlying theme throughout the history of EU integration is the conception that a passive citizenry exists that is based on a lack of civic participation and control in the political process.⁹¹ The following analysis explores some of the most prevalent explanations elucidating passive civic participation in the EU.

An array of reasons are put forward to explain why the widespread perception of a legitimacy crisis exists in the EU.⁹² This section highlights four of the most salient ideas that capture the argument. First, is the common understanding that the EU is a “*sui generis*” system of governance.⁹³ Second, is the argument that a constitutional deficit exists, where institutional structures and processes are viewed as undemocratic and unresponsive to the desires of the EU citizenry.⁹⁴ Third, is the argument that the EU suffers from a legitimation problem, since there is not a sufficient degree of political contestation over EU policy.⁹⁵ Fourth, is the “*demos problem*”, which rests on the notion that the EU fails to reflect a *genuine* democracy, with an overarching European vision.⁹⁶

The *sui generis* nature of the multilevel system of EU governance and the perception that the EU exerts dominating power creates a number of risks that can diminish its legitimacy. Throughout the integration process many new actors designed to represent a plurality of societal interests at different levels of EU governance have been established in an attempt to guarantee the Union’s smooth functioning and achieve objectives linked to the Community Method.⁹⁷ However, the complexity of EU governance and the increasing number of actors has led to significant confusion about how the EU functions. Moreover, the lack of representativeness of the EU and its institutions, the Community Method, the application of the institutional balance rather than the separation of powers, the lack of

⁹⁰ At the time of writing, despite Brexit negotiations, 28 Member States remain.

⁹¹ P Magnette, “European Governance and Civic Participation: Beyond Elitist Citizenship?” (2003) 51(1) Political Studies 144.

⁹² G Majone, “Europe’s ‘Democratic Deficit’: The Question of standards” (1998) 4(1) European Law Journal 5.

⁹³ A Follesdal and S Hix, “Why There is a Democratic Deficit in the EU: A Response to Majone and Moravcsik” (2006) 44(3) Journal of Common Market Studies 542.

⁹⁴ Menéndez, *supra*, note 10.

⁹⁵ Follesdal and Hix, *supra*, note 93, p 533.

⁹⁶ Such issues are related to the relationship between national citizenship and EU citizenship: JHH Weiler, “To be a European Citizen-Eros and Civilization” (1997) 4(4) Journal of European Public Policy 495; C Meyer, “Political Legitimacy and the Invisibility of Politics: Exploring the European Union’s Communication Deficit” (2002) 37(4) Journal of Common Market Studies 617.

⁹⁷ B Kohler-Koch and B Rittberger, “The ‘Governance Turn’ in EU Studies” (2006) 44 Journal of Common Market Studies 27.

parliamentary governance, and the perception of the technocratic nature of EU governance, where unelected and unaccountable bureaucrats exercise significant power at a great distance from the people, are factors that increase the potential for citizen confusion and contribute to the perception of a legitimacy crisis in the EU.⁹⁸

The notion that there are insufficient avenues for genuine political contestation is reinforced by the increasing transfer of powers towards the EU level. This important trend concerning the enhanced scope of EU action, particularly since the Maastricht Treaty, reinforces the argument that the EU is largely operating outside the control of member state governments and the peoples of Europe. Aside from the European Parliament – the Council, the Commission, the European Council, and the CJEU – the main institutions operating at EU level are unelected.⁹⁹ Moreover, the argument that European Parliament elections are “second order elections” also raises key legitimization concerns that strengthen the argument that the European Parliament is not a genuine parliament since, “the composition of the directly elected European Parliament does not precisely reflect the ‘real’ balance of political forces in the European Community”.¹⁰⁰ This perception still exists in the current institutional framework, even after the European Parliament has obtained enhanced power with successive Treaties, since its members were directly elected in 1979.¹⁰¹

Concerns over the European Parliament’s role in the EU political process remain post-Lisbon Treaty, when the European Parliament obtained an enhanced role in the EU legislative process and national parliaments received enhanced powers to limit EU action through the principle of subsidiarity.¹⁰² Unelected actors at the EU level, aside from the European Parliament, and the increased scope of EU administrative action contribute to the perception that power is transferred from actors operating at the national level to unelected EU bureaucrats who largely operate outside political controls and are unaccountable to the EU citizenry.¹⁰³ Concerns that the European Parliament does not exercise *genuine* parliamentary powers strengthen arguments in favour of the demos problem and may have a depressive effect on voter turnout for European Parliament elections. This presents a significant paradox, as citizen participation in EU governance is particularly important in light of a number of key crises facing the EU that exacerbate the need

⁹⁸ D Johnson, “Institutional Balance, Civic Virtue and Dialogue: A Republican Balancing Act for the EU Constitutional Order” (2018) 1(1) UCL Journal of Law and Jurisprudence-Special Issue 11.

⁹⁹ Art 14.3 TEU.

¹⁰⁰ Karlheinz and Schmitt, *supra*, note 19, p 3.

¹⁰¹ For discussions on how the euro crisis can exasperate legitimacy concerns over the limits of the European Parliament’s role in EU decision-making compared with the Council, Commission, and European Central Bank in Eurozone decision-making: VA Schmidt, “The Eurozone’s Crisis of Democratic Legitimacy: Can the EU Rebuild Public Trust and Support for European Economic Integration?” (2015) European Commission’s Directorate-General for Economic and Financial Affairs Discussion Paper No 015 <ec.europa.eu/info/sites/info/files/dp015_en.pdf> (last accessed 4 July 2019).

¹⁰² Art 5 of the Treaty on the EU and Protocol No 2 on the Application of the Principle of Subsidiarity and Proportionality); R Schütze. “Subsidiarity after Lisbon: Reinforcing the Safeguards of Federalism?” (2009) 68(3) *The Cambridge Law Journal* 525.

¹⁰³ See the Spitzenkandidaten process to elect Commission President: European Parliamentary Research Service. “Election of the President of the European Commission Understanding the *Spitzenkandidaten* Process”, p 1.

for a clear and coherent European vision to tackle challenges related to Brexit, security, nationalism, rule of law, the euro crisis, and migration. Such debates highlight significant contestation concerning how to address existing crises in the EU and present urgent questions, particularly whether the EU has the capacity to meet citizens' expectations and govern in a manner that mitigates existing risks. Legitimacy questions also highlight the lack of a cohesive social and cultural identity that binds the peoples of Europe together.¹⁰⁴

This analysis illustrates that questions concerning civic participation in the political process are at the heart of the legitimization debate in the EU, threatening its ability to live up to the constitutional aspirations of a Europe that is "United in Diversity".¹⁰⁵ Consequently, a range of methods designed to augment civic participation, address its legitimacy crisis, and achieve democratic ideals have been introduced in the EU.¹⁰⁶ Such methods include enhancing the role of the European Parliament and national parliaments in EU governance, facilitating a greater role for civil society in EU decision-making through Commission dialogues with stakeholders and social dialogues.¹⁰⁷ The Better Regulation Agenda has also been developed, which aims to diminish regulatory burdens and promote open and transparent governance that strengthens the role of citizens and civil society in EU decision-making processes.¹⁰⁸ Each of these methods are illustrative examples of how the EU attempts to enhance the participatory nature and legitimacy of EU governance by engaging in a dialogue between distinct actors – EU institutions and other bodies, member states, civil society, and the peoples of Europe – operating at different levels within the EU. As subsequent sections highlight, the EU is also attempting to engage in multi-actor dialogues concerning the role of blockchain technology in regulating risks across Europe.¹⁰⁹

This section explores arguments that exemplify justifiable concerns that a fundamental disconnect exists between EU normative aims, its actions, and citizens' expectations. Arguments explaining why a legitimacy deficit exists are closely related to the unique characteristics of EU governance and can lead to profound uncertainty over who does what, when, and how in the complex multi-level system of EU governance. Such

¹⁰⁴ For example, such issues are related to the relationship between national citizenship and EU citizenship: C Meyer, "Political Legitimacy and the Invisibility of Politics: Exploring the European Union's Communication Deficit" (2002) 37(4) *Journal of Common Market Studies* 617; see also Weiler, *supra*, note 96.

¹⁰⁵ The Brexit debate embodies concerns over the legitimization and democratic nature of the EU. Concerns that the EU is insufficiently democratic and unresponsive to British demands have led to calls for British withdrawal from the EU to restore sovereignty to the British people; S Holbolt, "The Brexit Vote: A Divided Nation, a Divided Continent" (2016) 23(9) *Journal of European Public Policy* 1259.

¹⁰⁶ B Finke, "Civil Society Participation in EU governance" (2007) 2(2) *Living Review European Governance* 4.

¹⁰⁷ For instance, social dialogues require the Commission to consult social partners – representatives of management and labour – in the field of social policy: Consolidated Version of the Treaty on the of the European Union [2012] OJ C326/172; Arts 151–156 TFEU; Art 11.2 and 11.3 TEU.

¹⁰⁸ COM (2017) 651 final: Completing the Better Regulation Agenda: Better Solutions for Better Results.

¹⁰⁹ The EU creates newsletters on the EU Blockchain Observatory Forum and EU Blockchain roundtables. It has published reports in divergent areas, highlighting the role of blockchain in public services, "GDPR, and innovation throughout Europe: A Thematic Report on blockchain and the GDPR" by The European Union Blockchain Observatory and Forum; EU Blockchain Observatory and Forum. Workshop Report. E-identity, Brussels, 7 November 2018. This is consistent with legal requirement that "the institutions shall maintain an open, transparent, and regular dialogue with representative associations and civil society": Art 11.2 TEU.

developments make it difficult for citizens to understand where the EU's sources of legitimacy stem from, how to hold those that exercise power to account, and the consequences of EU elections.¹¹⁰ These risks often lead to passive civic participation in the political process, as citizens do not know how their involvement will shape EU governance. Further, passive civic participation raises significant questions about the EU's capacity to promote participatory governance and democratic ideals in a manner that fosters public deliberation and civic engagement between a plurality of societal interests.¹¹¹ Such challenges threaten the EU's ability to realise one of its central objectives, a Europe that is "United in Diversity".¹¹² Thus, to ensure legitimacy and promote democratic ideals, any vision for the future of Europe must incorporate citizens in a multi-actor dialogue to search for common solutions, reconcile competing social interests and to meet citizens' expectations. The next section explores the prospects and limits of blockchain-based voting in the US and the EU.

V. THE PROSPECTS AND LIMITS OF BLOCKCHAIN-BASED VOTING IN THE US AND EU

Thus far, the analysis highlights that the US has a long and arduous history of deep contestation concerning the right to vote and participate in the political process.¹¹³ The existing US electoral system presents two systematic risks – voter suppression and manipulation of the vote – that have presented power imbalances and social inequalities which threaten constitutional ideals.¹¹⁴ These risks are not a new phenomenon within the US electoral and political system, but a persistent theme causing systematic challenges throughout the nation's history. Meanwhile, the history of EU integration shows that EU citizens have often been left out of vital debates over the relationship between the exercise of public power and individual and political freedom. Despite a number of attempts over recent decades to strengthen citizens' rights and enhance their role in the political process, the notion that a "legitimacy deficit" exists permeates EU discourse.¹¹⁵ This legitimisation deficit signifies that the EU and its institutions lack democratic support and are often seen as unresponsive to demands of its citizenry.¹¹⁶

¹¹⁰ As Magnette elucidates, the EU multilevel system of governance is a "highly complex institutional system, where sovereignty is pooled while accountability remains divided": Magnette, *supra*, note 91.

¹¹¹ A Malkopoulou, "Lost Voters: Participation in EU Elections and the Case for Compulsory Voting" (2009) CEPS Working Document No 317 <ssrn.com/abstract=1438562> (last accessed 4 July 2019).

¹¹² See Thym, arguing that the asymmetric and varying degrees of participation among member state does not conflict with the United in Diversity motto of the EU: D Thym, "United in Diversity – The Integration of Enhanced Cooperation into the European Constitutional Order" (2005) 6(11) *German Law Journal* 1731.

¹¹³ R Briffault, "The Contested Right to Vote" (2002) 100 *Michigan Law Review* 1506.

¹¹⁴ The Mueller Report, *supra*, note 79, 1–5.

¹¹⁵ Debates on the democratic deficit are still prevalent in the aftermath of the Lisbon Treaty, where the European Parliament became co-legislator in the ordinary legislative process in the majority of fields and national parliaments had an augmented role in the making of EU legislation; Consolidated Version of the Treaty on the Functioning of the European Union [2012] OJ C326/172 (Arts 289 and 294).

¹¹⁶ The notion of a legitimisation deficit is linked to the widely debated notion of democratic deficit: Follesdal and Hix, *supra*, note 93, p 533.

Currently, such risks are threatening the very constitutional and democratic ideals at the heart of American representative governance and participatory governance in the EU. Any potential solution must promote constitutional aspirations and democratic ideals, while minimising risks to avoid exasperating power imbalances. Blockchain-based voting has the potential to minimise existing risks in both jurisdictions.

The application of blockchain technology in electoral and political processes, although promising, presents substantial risks that limit its potential to obtain widespread acceptance among the citizenry, public institutions and civil society. The remainder of the analysis highlights several of the most prominent risks – domination, complexity, accessibility, lack of public confidence, and digital literacy and technical know-how – that are presented by the application of blockchain technology in voting use cases and provides suggestions for combatting them in the US and EU.¹¹⁷ The subsequent section highlights how blockchain-based voting use cases intensify debates on how best to secure the integrity of electoral and political processes. It elucidates a number of core challenges and fundamental risks involving existing blockchain networks and the potential application of the technology in future use cases. The analysis begins by providing important insights from blockchain-based voting use cases before exploring the potential application of the technology in the US and the EU.

1. Blockchain-based voting use cases: illuminating core risks with the technology

Existing blockchain-based voting use cases show significant obstacles that limit the potential for the widespread application of the technology in electoral and political processes.¹¹⁸ The blockchain-based voting use cases explored thus far, highlight fundamental risks that include the potential for one actor to dominate blockchain-based voting processes, the deeply complex nature of blockchain technology, a lack of digital (blockchain) literacy and technical know-how, different levels of internet speed and capacity, challenges concerning the stage of development of blockchain technology, and cultural and institutional resistance to the technology from large segments of society.

The aforementioned use cases illuminate key risks including the role of permission-based blockchain technology, where private companies such as the Swiss company, Agora, in the Sierra Leone election, Active Citizen in Russia, and Blocko in South Korea play an integral role shaping how a blockchain infrastructure functions. When such permissioned blockchains are utilised, private companies may be able to exert dominating power, diminishing the potential for *genuine* checks and balances on the blockchain network. As a result, using permissioned blockchains, private companies can almost unilaterally shape electoral and political processes, since they can control how the blockchain apparatus functions and remain in control of who has access or who can mine on a blockchain network. Similar to traditional voting methods, private

¹¹⁷ For technical challenges with the application of blockchain technology, such as scalability and miners hoarding blocks for future revenue, see Zheng et al, *supra*, note 6.

¹¹⁸ *ibid.*, p 352.

blockchains can provide the framework for an electoral system where a single authority can exert dominating control in the electoral or political system. Unilateral control by private companies – or any other actor – of a blockchain-based voting apparatus increases the potential that a single actor or group of actors can manipulate electoral and political processes.¹¹⁹ Public blockchains diminish the potential for any single actor to dominate voting processes, but face significant challenges of their own.

The complex nature of blockchain is linked to one of the key challenges currently facing public blockchains: scalability.¹²⁰ The scalability challenge concerns the scale and speed in which transactions can occur on a blockchain network. In voting use cases, scalability refers to the ability of a blockchain network to increase capacity to meet greater demand in order to handle all voting transactions within an electoral process, regardless of the size of the electorate. This transaction velocity is intimately connected to the efficacy of the blockchain and involves the time it takes to put a transaction on a block or reach a consensus between nodes on the network. It is important to note that certain blockchain networks require significant computing power, which reduces accessibility.

The existing use cases show public blockchains are not “sufficiently mature”, from a technical standpoint, to handle the demands of large electoral and political processes.¹²¹ A fully mature and operational blockchain would work well whether there is a small electorate (300,000), a medium sized electorate (3 million), or a rather large electorate (30 million). Thus, an efficacious blockchain infrastructure would handle the large number of voters on a network at the federal and state level in the US or in different levels of governance within the EU. Current blockchain networks are simply not sufficiently mature to handle such large demand. The scalability challenge means that the performance of public blockchains is currently limited.¹²² For these reasons, the scalability challenge presents fundamental obstacles to expanding the application of blockchain-based voting to large elections. Accordingly, existing use cases are generally private permission-based blockchains that have the capacity to process transactions more rapidly than public blockchains but leave control almost exclusively in the hands of a private entity. The essential role of private companies in blockchain-based voting use cases and the challenges of scalability in public blockchains raises the question whether private entities play a dominant role in existing use cases and whether the application of fully public blockchain voting infrastructures are realistic alternatives to traditional voting methods in the near future.

The Colombian Plebiscite use case further illuminates fundamental risks concerning the complex nature of blockchain technology.¹²³ Such risks are connected to questions concerning the complexity of blockchain, digital (blockchain) literacy and technical

¹¹⁹ Hanifatunnisa and Budi, *supra*, note 27.

¹²⁰ Scalability is also a challenge for private blockchains, but private companies often have less difficulty addressing the challenge because of greater computing power; see X Xu et al, “The Blockchain as a Software Connector” (2016) 13th Working IEEE/IFIP Conference on Software Architecture (WICSA) pp 182–191.

¹²¹ At the moment, public blockchains do not have the capacity to handle large scale (voting) transactions efficiently, since transactions on a public blockchain occur at a very slow pace.

¹²² *ibid.*

¹²³ van Ooijen, *supra*, note 45.

know-how, issues involving how the technology works, who controls the blockchain network, the potential efficacy of blockchain-based voting, limited internet access and computing power, and cultural and institutional resistance from those in public service, private interests groups, or segments of the citizenry who favour the status quo.¹²⁴ The Colombian use case highlights fundamental risks connected to the widespread application of blockchain-based voting in the digital age, including significant misunderstandings concerning how the technology works and considerable scepticism concerning the potential for blockchain to guarantee the integrity of electoral outcomes. The complexity of blockchain technology and lack of blockchain literacy among citizens, public officials, and civil society presents another fundamental question, whether blockchain-based voting genuinely enhances citizen access and participation in electoral and political decision-making systems. Blockchain also presents its own concerns involving voter identity and the security of electoral and political processes, including potential cyberattacks. For the abovementioned reasons, instead of strengthening public confidence, the complex nature of the technology, and the amount of computing power necessary to run blockchain may actually limit access and increase distrust in the US and EU, as citizens may face difficulty understanding how blockchain-based voting works and lack the technical knowledge or the resources to act as a vibrant participant on a blockchain network.¹²⁵ Ensuing sections show that innovative solutions are needed in order to overcome existing risks in the US and EU electoral and political systems, as well as risks presented by blockchain-based voting.

2. Blockchain-based voting: a digital tool to promote constitutional values and minimise risks in the US and EU electoral and political systems?

The core features of blockchain – its decentralised, immutable, inclusive and secure nature – can promote constitutional values and diminish risks in the US and the EU electoral and political systems. The technology can minimise the potential for domination, enhance security, and facilitate greater transparency and openness in decision-making processes, while maintaining the privacy and anonymity of voters in a manner consistent with good governance standards in contemporary constitutionalism.¹²⁶ As non-domination and limited government are foundational elements necessary to achieve democratic ideals, a blockchain-based voting apparatus must promote such constitutional values. Consequently, a legitimate blockchain-based voting infrastructure must operate in a fashion that diminishes power imbalances, social inequalities, and informational asymmetries, while preventing any entity from exerting dominance. Thus, it is critically important that blockchain-based voting does not become a means for factional societal interests, such as political, technical, or legal elements to dominate decision-making processes.

¹²⁴ *ibid.*

¹²⁵ A Deshpande et al, “Distributed Ledger Technologies/Blockchain: Challenges, Opportunities and the Prospects for Standards” (2017), Overview report The British Standards Institution (BSI) p 10.

¹²⁶ It has been argued that blockchain is a constitutional community: S Davidson et al, “Economics of Blockchain” (2016) <papers.ssrn.com/sol3/papers.cfm?abstract_id=2744751> (last accessed 16 July 2019).

Among the many virtues of blockchain-based voting is its potential to foster democratic ideals linked to equality and non-domination, as there is no central command or established hierarchy on a fully operational blockchain network. Instead, blockchain allows the people to operate as principal players who exercise checks and balances throughout the entire voting process. Its projected capacity to guarantee that a single actor does not unilaterally control decision-making processes is a vital element to ensure that systematic checks and balances exists. Blockchain technology can also facilitate open and transparent decision-making so that those exerting power reflect societal ideals, and are held to account.¹²⁷ In the process, it can alert voters of administrative errors and attempts to manipulate the vote. In essence, the technology can incentivise citizen participation by granting citizens greater control in electoral governance.

Certain elements are essential within a blockchain network to achieve constitutional values connected to the right to vote and civic participation. For instance, certain steps are required to combat the risks of domination that can lead to fundamental threats to the integrity and security of elections. Constructing blockchain networks with a large number of nodes is one way to promote a strong consensus mechanism that prevents any actor from playing a dominant role on a blockchain network. Further, existing risks in decision-making processes necessitate the creation of multi-track verification processes on blockchain networks. One track that focuses on guaranteeing the authenticity of the voter (voter id), while another focuses on guaranteeing the integrity and validity of the information (blocks) on the blockchain. A multi-track verification process can ensure that checks and balances exist in electoral processes that diminish the chance of any entity being able to exercise dominance.

The blockchain network, with a multitude of nodes that monitor electoral processes and outcomes, and multi-prong verification processes, can offer greater citizen control and participation in political processes than traditional voting methods.¹²⁸ The technology makes it possible to maintain a timestamped immutable audit trail that secures the capacity for *genuine* checks and balances during different phases of the electoral process. The nodes on the network can verify and publicise that someone voted, while explaining which decision was taken and when, without identifying the voter or linking a voting transaction to a particular voter.¹²⁹ The tracking of information on a blockchain during different stages of the electoral process in a secure, decentralised, and immutable fashion also diminishes the potential for arbitrary electoral outcomes. Moreover, blockchain is seen as a method to enhance the efficacy of electoral governance and increase transparency, making voting processes more accessible and inclusive, while ensuring that those who exercise

¹²⁷ On the importance of accountability see M Bovens, "Analysing and Assessing Public Accountability. A Conceptual Framework" (2006) European Governance Papers: EUROGOV No C-06-01, <www.ihs.ac.at/publications/lib/ep7.pdf> (last accessed 4 July 2019).

¹²⁸ D Frisby, "In Proof We Trust" (*Aeon*, 21 April 2016) <aeon.co/essays/how-blockchain-will-revolutionise-far-more-than-money> (last accessed 4 July 2019).

¹²⁹ As Satoshi Nakamoto explains, a main advantage of the blockchain is its ability to make transactions public, while maintaining personal anonymity: Nakamoto, *supra*, n 1.

powers are held accountable for their actions.¹³⁰ The technology can also help diminish voting irregularities and reduce administrative and transaction costs, while providing a systematic response to significant challenges to the integrity of the US electoral system and passive civic participation in the EU.¹³¹ Ultimately, the technology can help reduce uncertainty and restore public confidence in electoral outcomes by allowing the people to play a greater role controlling and monitoring electoral processes.¹³²

The aforementioned elements of blockchain technology are consistent with contemporary standards of good governance and enhance the potential for citizens to hold their government to account, minimise the potential for arbitrary voting processes and maladministration that can lead to ineffective governance and increase public distrust.¹³³ For these reasons, blockchain supporters argue that the technology can diminish concerns over the integrity of voting processes and promote constitutional values by securing a balanced constitutional order that minimises the potential for arbitrary decision-making and the abuse of power by preventing any single societal force from unilaterally dominating the distinct processes of electoral and political governance.¹³⁴ The following sections address the application of blockchain-based voting and the potential for future use cases in the US and EU.

3. The US state of West Virginia's 2018 blockchain-based voting use case

Blockchain-based voting is in its initial stages around the world. The prospects of simplifying voting and guaranteeing secure electoral processes has led to the launch of several pilot projects in the US.¹³⁵ An illustrative example of the application of blockchain-based voting is the US state of West Virginia's use of the technology in the 2018 midterm elections.¹³⁶ West Virginia created a blockchain-based voting pilot program, with the aim of securing the right to vote for military and overseas US citizens permitted to vote in the state. To address challenges facing such voters when they attempted to cast their ballot, West Virginia state officials worked with Voatz Inc, a mobile voting company, to develop a blockchain-based voting application for US citizens overseas to receive and cast a ballot electronically utilising biometric identity verification.¹³⁷ Blockchain technology was then used to store votes until

¹³⁰ S Underwood, "Blockchain Beyond: Bitcoin Blockchain technology has the Potential to Revolutionize Applications and Redefine the Digital Economy" (2016) 59(11) Communications of the ACM 15; MJW Rennock et al, "Blockchain Technology and Regulatory Investigations" (2018) The Journal 34.

¹³¹ S Bowler and T Donovan, "A Partisan Model of Electoral Reform: Voter Identification Laws and Confidence in State Elections" (2016) 16(3) State Politics & Policy Quarterly 340.

¹³² Teogenes and Gomes, *supra*, note 29.

¹³³ *ibid.*

¹³⁴ S Davidson et al, "Disrupting Governance: The New Institutional Economics of Distributed Ledger Technology" (2016) <ssrn.com/abstract=2811995> (last accessed 4 July 2019).

¹³⁵ Examples of such pilot projects include blockchain-based voting for political parties in a republican primary in Utah and the city of Denver, Colorado in the US creating and implementing a blockchain pilot project for municipality voting. The elections in Utah did not provide the best results: <followmyvote.com/2016-presidential-race-blockchain-voting-utah><<https://medium.com/universablockchain/transparent-elections-on-blockchain-e3a1c7707bc7>>; <www.coindesk.com/city-of-denver-to-pilot-blockchain-voting-app-in-coming-elections>.

¹³⁶ See <sos.wv.gov/elections/Pages/MobileVote.aspx>.

¹³⁷ A Warner, "Warner Pleased with Participation in Test Pilot for Mobile Voting", Office of the Secretary of State Press Release, 16 November 2018.

election night, so that information was not leaked that could impact voters who had yet to cast their ballot. In order to implement a blockchain-based voting application for midterm elections, rigorous security measures were conducted to ensure the integrity of the voting application. Security methods were deployed to ensure votes were not interfered with, which included post-election auditing by external companies that demonstrated the potential for blockchain-based voting to act as a viable alternative to what is often an arduous mail-in voting process in the West Virginia use case.¹³⁸ West Virginia's decision to use a blockchain-based voting application for military and overseas ballots lays the framework for more states or cities in the US to experiment with the technology. The West Virginia use case and the recent application of blockchain-based voting in 2019 in the city of Denver, Colorado illustrate a push for the creation and implementation of the technology in new voting use cases. Although the application of blockchain-based voting in the West Virginia 2018 use case is largely viewed as a success by state officials, the aforementioned risks – potential for domination, lack of digital literacy and technical know-how, and low public confidence – limit the potential for the widespread application of the technology in future US election.¹³⁹ Nevertheless, more pilot projects are necessary to overcome the risks associated with the technology before the widespread application of blockchain-based voting across the US. Meanwhile, in the EU, a number of initiatives have been developed in order to promote civic participation and facilitate a dialogue on the application of blockchain across a wide range of fields.

4. The EU Blockchain Observatory and Forum: a dialogue

The EU is taking significant steps to secure a prominent role as a global leader in blockchain technology.¹⁴⁰ The EU Blockchain Observatory and Forum is a paradigmatic example.¹⁴¹ Created as a Pilot Project, the Commission initiates dialogues with civil society, with the aim of creating a blockchain infrastructure, enabling blockchain innovation, and developing best practices for the use of the technology.¹⁴² The European Parliament has voiced its institutional position concerning the potential for blockchain to build trust across a number of different sectors within the EU.¹⁴³ The Council has acknowledged the need to address the emergence of blockchain and called for more action to regulate risks associated with the technology.¹⁴⁴ Meanwhile, a number of member states and Norway have also signed the European Blockchain Partnership to support the delivery of cross-border

¹³⁸ See <sos.wv.gov/elections/Pages/MobileVote.aspx>.

¹³⁹ The West Virginia Secretary State claims that the 2018 General Elections (midterms) were a huge success: <sos.wv.gov/news/Pages/11-15-2018-A.aspx>.

¹⁴⁰ 27 member states and Norway have joined the Partnership on Blockchain: <ec.europa.eu/digital-single-market/en/news/european-countries-join-blockchain-partnership>.

¹⁴¹ See <www.eublockchainforum.eu/about>; <europa.eu/rapid/press-release_IP-18-521_en.htm>.

¹⁴² *ibid.*

¹⁴³ European Parliament Resolution of 3 October 2018 on Distributed Ledger Technologies and Blockchains: Building Trust with Disintermediation (2017/2772 (RSP)).

¹⁴⁴ EUCO 14/17 CO EUR 17 CONCL 5. 19 October 2017, Brussels.

public services.¹⁴⁵ Such activities allow for an exchange of ideas, a mapping of relevant blockchain initiatives, pooling of expertise and resources, and provide incentives for member states, civil society, and citizens to actively participate in debates concerning blockchain-based voting.¹⁴⁶ These initiatives show the EU is creating innovative ways to engage citizens to help shape debates concerning how blockchain impacts European society. The next section examines the potential application of blockchain based-voting for ECI to explore whether the technology is a viable tool to enhance civic participation, promote open and transparent governance, and facilitate multi-actor and multi-level dialogues over the role of blockchain in processes of EU governance.

5. The potential application of a blockchain-based voting pilot project for the ECI

The ECI is an innovative method with the potential to transform our understanding of the multilevel system of EU governance by facilitating an active role for civic engagement in the political process.¹⁴⁷ Introduced in the Lisbon Treaty, it is one of the most promising instruments in which to activate civic participation within the EU.¹⁴⁸ The ECI is designed to enhance civic participation and ensure an ongoing dialogue on key EU policy issues that extend beyond the central decision-making institutions at the EU and national levels.¹⁴⁹ Despite its great promise, the ECI has yet to meet expectations.¹⁵⁰

A key barrier to fully realising the potential of the ECI concerns the question how to meet the legal requirements to launch an initiative.¹⁵¹ The legal requirements of the initiative demand at least a million citizens who are nationals of at least seven different member states request the European Commission to make a proposal for an EU legislative act.¹⁵² The inability for the ECI to successfully initiate more than a handful of legislative acts has caused significant concern and threatens the potential of the instrument to foster civic engagement. Consequently, the Commission, European Parliament, and Council attempted to revamp the ECI through a new EU regulation, with the aim of enhancing the role of the ECI in EU decision-making.¹⁵³

¹⁴⁵ <ec.europa.eu/digital-single-market/en/news/european-countries-join-blockchain-partnership>.

¹⁴⁶ The Official Newsletter European Union Blockchain Observatory and Newsletter.

¹⁴⁷ Art 11.4 TFEU.

¹⁴⁸ M Conrad, "The European Citizens' Initiative: Transnational Democracy in the EU At Last?" (2011) 7(1) 1 *Stjórnmal og Stjórnsýsla* 5.

¹⁴⁹ Importantly, the ECI grants the European Commission the power to decide whether to launch a proposal, even if the legal requirements are met, if it justifies why it does begin a legislative proposal: LB Garcia and J Greenwood, "The European Citizens' Initiative: a New Sphere of EU Politics?" (2014) 3(3) *Interest Groups and Advocacy* 246.

¹⁵⁰ Only a handful ECIs have been successful thus far: A Karatzia, "The European Citizens' Initiative and the EU institutional balance: On Realism and the Possibilities of Affecting EU Lawmaking" (2017) 54(1) *Common Market Law Review* 177.

¹⁵¹ Another important concern is that an ECI that meets the legal requirements does not bind the Commission to act: *ibid.*

¹⁵² It has proven to be an arduous task to meet the legal requirements under the ECI: Art 11.4 TFEU; Regulation No 211/2011 of the European Parliament and of the Council on the Citizen's Initiative (OJ L 65, 11.3.2011, p 1).

¹⁵³ The new ECI regulation is designed to enhance the number of successful ECIs in EU governance – according to the Commission as of May 2019, there have only been four successful ECIs: see Regulation (EU) 2019/788 of the European Parliament and of the Council on the European Citizen's Initiative (OJ L 130, 17.5.2019, p 55–81); the European Citizens' Initiative. Commission Factsheet 2019, available at <ec.europa.eu/citizens-initiative/public/regulation-review>.

Debates concerning the new ECI regulation provide an excellent opportunity for the EU to experiment with blockchain technology. The new regulation aims to establish an online platform with registration initiatives that organise signatures and support initiatives, that would require a reduced amount of personal data to start an initiative. The new regulation is designed to enhance follow-up mechanisms for successful initiatives after the formal requirements are met.¹⁵⁴ In the aftermath of the new regulation the Commission, European Parliament, and Council should take the additional step of debating the introduction of blockchain-based voting for ECIs.

The decentralised nature of blockchain can provide more avenues for democratic contestation through ECIs, facilitating the use of bottom up processes that can enhance the role of citizens in EU policy-making. The technology has the potential to help citizens meet the legal requirements with the ECI by making it easier to obtain the necessary votes. The participants in the blockchain network can engage in a multi-actor dialogue to verify existing data and assess it against any potential manipulation, providing the framework for multi-actor checks and balances that guarantee the veracity of the digital signatures on the blockchain network, to ensure compliance with the ECI legal requirements. The application of blockchain on ECI can prevent centralised Union institutions from unilaterally establishing EU law and policy.¹⁵⁵

Thus, far this section has surveyed a number of existing and potential use cases, with particular emphasis on the US and the EU to examine how blockchain-based voting can further individuals to actively participate in fundamental decisions that affect their lives.¹⁵⁶ The preceding analysis demonstrates that blockchain has great promise. It has the potential to secure the right to vote, while minimising risks linked with voter suppression, voter manipulation and passive civic participation in electoral and political processes. Yet, the technology presents a number of new risks that have not fully been addressed, which limit the potential for its widespread application. Different solutions can be implemented to combat the risks connected with blockchain. The penultimate section elucidates how a dialogue on blockchain can help overcome risks connected to the application of blockchain-based voting in the US and the EU.

6. A blockchain dialogue: a way forward

This article contends that dialogical fora on blockchain have the potential to promote constitutional values and democratic ideals, while combatting existing risks in electoral and political processes in the US and the EU, as well as risks connected with the application of blockchain-based voting. The promotion of dialogues on blockchain involves creating inventive initiatives that promote educating the US and EU citizenry to ensure blockchain-based voting is inclusive, accessible, efficient, and

¹⁵⁴ *ibid.*

¹⁵⁵ M Orcutt, "How Secure is Blockchain Really?" (*MIT Technology Review*, 2018) <www.technologyreview.com/s/610836/how-secure-is-blockchain-really/> (last accessed 4 July 2019) 93; *ibid.*, 22.

¹⁵⁶ R Osgood, "The Future of Democracy: Blockchain Voting" COMP116: Information Security (2016); Zyskind and Nathan, *supra*, note 3.

understandable. The importance of consensus-based decisions is also exemplified in the dialogical model that includes a wide plurality of societal interests. Multi-actor dialogues can secure public deliberation, democratic contestation, and promote checks and balances in different phases of the electoral and political process. Such dialogical fora show that government is taking the potential of blockchain-based voting seriously, and so should the citizenry. Multi-actor and multi-level dialogue between citizens, civil society interest groups, and government officials can also facilitate a balanced interaction between a range of societal forces that informs citizens of contested public policy issues and voting rules, while encouraging citizen participation in the political process.¹⁵⁷ When citizens are actively informed and participate, they can act as a genuine check in electoral and political processes. While traditional voting promotes hierarchical command and control forms of governance where a centralised authority monitors each phase of the electoral process, blockchain governance relies on decentralised and multi-actor dialogues where multiple actors create regulatory standards and control electoral and political systems.¹⁵⁸ Accordingly, the decentralised nature of blockchain, multi-actor dialogue, and a balanced interaction between an array of societal forces can ensure hi-tech voting systems do not disadvantage those without technical acumen. Another important step that can alleviate potential power imbalances which blockchain technology may present is to ensure that electoral oversight bodies – such as the US Elections Assistance Commission, which sets US legal standards and best practices governing voting processes at the federal and state level – include a plurality of societal interests: political representatives, regulators, cybersecurity and tech community, legal, business, and privacy groups operating at different levels of governance. Representatives from the different groups can be placed on such committees, with an equal number of individuals of party or member state affiliation to prevent any single interests from dominating.

Greater government funding to start or expand blockchain-based voting pilot programs can encourage broader participation from civil society, public and private interest groups and individuals. Incentivising distinct societal forces to contribute to debates on the role of blockchain-based voting in electoral and political processes can help ensure multi-actor and multilevel checks and balances within electoral and political processes. Similarly, more public funding for research on the prospects and limits of blockchain and initiatives to better inform the citizenry are necessary in both jurisdictions. Civic engagement initiatives, which facilitate active participation, provide for dialogical exchanges, where information and technological knowledge is shared among a plurality of societal interests, are also necessary. Such initiatives allow for the viewpoints of different societal interests to be voiced and heard, provide avenues for democratic contestation based on rational deliberation, and provide the framework for governments to be more responsive and accountable to the citizenry.

¹⁵⁷ For an analysis promoting a constitutional model that highlights the need for a balanced constitutional order by promoting an ongoing dialogue between a range of public and private societal forces: Johnson, *supra*, note 56.

¹⁵⁸ Fisher, *supra*, note 19.

This analysis argues that a legitimate constitutional order secures constitutional values that promote public deliberation, democratic contestation, non-arbitrariness, and multi-actor and multi-level checks and balances. The question remains whether blockchain can help achieve such constitutional values. To fully realise the potential of blockchain-based voting more experimentalism is necessary in both constitutional orders. Both jurisdictions can follow the lead of West Virginia and facilitate blockchain initiatives similar to the EU's Blockchain Observatory and Forum. For instance, the US federal government can launch new pilot programs and provide funding for different states across the US to implement blockchain-based voting on an experimental basis. Moreover, more multi-actor dialogues can be created through dialogical fora that facilitate open and transparent discourse on the prospects and limits of blockchain-based voting. Thus, the US can learn from the EU by providing more dialogical fora for debates on the future of blockchain. The EU is already actively involved in debates, initiatives, and pilot programs, exploring the role of blockchain in European society. It can take steps to stimulate debate over the future role of blockchain and further digitalise European democracy. Moreover, the EU can apply lessons from the application of blockchain-based voting in West Virginia and other blockchain-based voting use cases by applying the technology to the ECI and assess the technology's potential as a tool to empower European citizens.

VI. CONCLUSION

This article shows that systematic risks – voter suppression and manipulation of the vote in the US and passive civic participation in the EU – raise fundamental legitimation questions that prevent each jurisdiction from fully achieving constitutional ideals connected to “We the People” in the US and “United in Diversity” in the EU. As a result, both jurisdictions are currently facing the threat of democratic backsliding. Such challenges provide compelling reasons to explore new methods of democratic experimentalism utilising blockchain-based voting.

This article contends that the decentralised, immutable, accessible, transparent, and secure nature of blockchain technology has the potential to enhance the legitimacy of the US and EU electoral and political systems. Blockchain-based voting can act as a dialogical forum for enhanced civic participation, public deliberation, and democratic contestation that secures constitutional values, minimises existing risks and those presented by the application of the technology. Importantly, blockchain promises to shift the balance to more democratic, decentralised, and heterarchical power relations by creating multi-level and multi-actor checks and balances, where citizens play a key role controlling and monitoring electoral and political processes, instead of current top-down regulatory processes focusing on methods that reinforce public authority through command and control processes.

Blockchain-based voting promises to be one of many options that complements traditional electoral and political processes. However, this analysis suggests that – at its current stage of development – blockchain-based voting has the potential to be viable, but primarily in non-binding participatory modes of governance or small-scale

elections. At the moment, large-scale voting in the representative context is not feasible because of profound risks presented by blockchain – the potential for dominating power relations, the complexity of the technology, lack of digital literacy and technical know-how, scalability, and citizen and institutional resistance. At its current stage of development – prior to its widespread application – inventive methods are necessary before the technology can realise its full potential. A number of steps can be taken in order to promote a blockchain-based voting infrastructure that operates as a digital tool to promote constitutional values and diminish existing social inequalities, power imbalances, and informational asymmetries, as well as overcome risks that arise in connection with the use of the technology. First, more research concerning how to design a blockchain infrastructure that prevents the potential for either public officials or private entities to dominate an electoral system is necessary. Second, more pilot projects testing the application of the technology are required. Third, more avenues for democratic contestation and deliberative fora for blockchain dialogues must be created, to further educate the citizenry about the technology and elucidate its benefits and risks. Fourth, increased funding that can contribute to research and development on blockchain-based voting is also essential. This article does not suggest that such steps can solve all the problems in the existing US and EU electoral and political systems or those linked with blockchain-based voting. Instead, it concluded that such methods can intensify efforts to make the great promise of blockchain a reality by securing constitutional values and democratic ideals while minimising risks in US and EU electoral and political systems.