Artículo de investigación

Applying Technologies of Distributed Registries and Blockchains in Popular Voting and Lawmaking: Key Methods and Main Problems

Aplicación de tecnologías de registros distribuidos y cadenas de bloques en votaciones populares y legislaciones: métodos clave y problemas principales

Применение технологий распределенных реестров и цепочек блоков в народных голосованиях и законотворчестве: ключевые способы и основные проблемы

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Abstract

Being a driving force behind the development of various social relations, the intensification of modern technologies forms new conditions for modernizing democratic institutions. Different innovations in the field of digital communications affect mechanisms for the realization of political rights and freedoms of a person and citizen, transform activities of public authorities and tools of their interaction with civil society institutions. In these conditions, innovations influence even traditional areas, including popular voting and lawmaking. The active introduction of distributed registry technologies affected the development of new methodological approaches and reformed the organization of elections. This technology has widespread use due to blockchain technology. Although it was initially considered as an element of development in the information and financial spheres, now blockchain is gradually entering other spheres of human activity, including political, due to the high degree of security and confidentiality. This paper analyzes the global practice of using this technology in popular voting and legislative procedures. The authors of

Аннотация

Современная интенсификация технологического развития, выступая движущей силой развития широкого спектра общественных отношений, обеспечивает формирование новых условий модернизации демократических институтов. Многообразие инноваций в области цифровых коммуникаций влияет на механизмы реализации политических прав и свобод человека и гражданина, трансформирует деятельность органов государственной власти и инструменты их взаимодействия с институтами гражданского общества. В этих условиях инновации затрагивают даже достаточно традиционные сферы, например такие как народные голосования и законотворчество. Особое влияние в разработке новых методических подходов к переосмыслению процесса организации и проведения голосования оказало повсеместное внедрение технологии распределенных реестров. Наибольшее распространение эта технология получила с применением цепочки блоков (блокчейн).

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the article consider technical solutions applied in the most rapidly growing projects aimed to develop their own software for conducting electronic election powered by a blockchain technology. Special attention is paid to the legal security of voting by secret ballot and the identification of voters in the conditions of applying these technologies.

Keywords: blockchain, distributed communication systems, distributed ledger technologies, distributed registers, the rule of people, election, popular voting, electronic voting, digital economy.

Несмотря на то, что первоначально она рассматривалась исключительно в качестве элемента развития в информационной и финансовой сферах, на современном этапе из-за высокой степени безопасности и конфиденциальности, блокчейн постепенно получает все большее распространение в иных сферах человеческой деятельности, в том числе и в политической. В настоящей работе проанализирована мировая практика применения данной технологии в народных голосованиях и законодательных процедурах. Детально рассмотрены технические решения, примененные в наиболее активно развивающихся проектах, направленных на разработку собственного программного обеспечения для проведения электронных голосований с применением технологии блокчейн. Отдельное внимание уделено правовому обеспечению тайны голосования и идентификация избирателей в условиях применения этих технологий.

Ключевые слова: блокчейн, распределенные системы коммуникаций, цепочки блоков, распределенные реестры, народовластие, выборы, народные голосования, электронные голосования, цифровая экономика.

Resumen

La intensificación moderna del desarrollo tecnológico, que es la fuerza impulsora del desarrollo de una amplia gama de relaciones sociales, garantiza la formación de nuevas condiciones para la modernización de las instituciones democráticas. La variedad de innovaciones en el campo de las comunicaciones digitales afecta los mecanismos para la implementación de los derechos políticos y las libertades del hombre y el ciudadano, transforma las actividades de las autoridades públicas y las herramientas de su interacción con las instituciones de la sociedad civil. En estas condiciones, las innovaciones afectan incluso a áreas bastante tradicionales, como la votación popular y la legislación. La influencia generalizada en el desarrollo de nuevos enfoques metodológicos para repensar el proceso de organización y realización de votaciones se realizó mediante la introducción generalizada de la tecnología de los registros distribuidos. Esta tecnología ha recibido la mayor distribución con el uso de una cadena de bloques (blockchain). A pesar de que inicialmente se consideraba únicamente como un elemento de desarrollo en las esferas de la información y las finanzas, en la etapa actual, debido al alto grado de seguridad y confidencialidad, el blockchain se está volviendo cada vez más común en otras esferas de la actividad humana, incluida la política. Este documento analiza la práctica global de utilizar esta tecnología en los procedimientos populares de votación y legislación. Las soluciones técnicas aplicadas en los proyectos de desarrollo más activo dirigidos a desarrollar su propio software para realizar votaciones electrónicas utilizando la tecnología blockchain se consideran en detalle. Se presta especial atención al apoyo legal del secreto del voto y la identificación de los votantes en las condiciones de aplicación de estas tecnologías.

Palabras clave: blockchain, sistemas de comunicación distribuidos, cadenas de bloques, registros distribuidos, democracia, elecciones, voto popular, voto electrónico, economía digital.

Introduction

In recent years, one of the key phenomena determining the development of both modern technologies and society as a whole has been decentralization. This term is not new; the idea of

three types of communication systems was first put forward by American scientist Paul Baran in 1964 (Baran, 1964). Along with centralized and decentralized communication systems, the researcher proposed a new type – a distributed system. A distributed communication system (peer-to-peer) does not have a unified decision-making center (server), its parts directly communicate with each other and form a single network. The term "distributed registries" is closely connected with a broader term – distributed communication systems – which has entered scientific language recently.

Despite the rapid development of distributed communication systems, the first cases of their successful implementation have been known for a relatively long time. Widely known examples of its use are Napster (music sharing peer-to-peer network) and BitTorrent (communication protocol for peer-to-peer file sharing).

In the socio-political sphere, one of the first applications of distributed registry technologies became Firechat messenger that gained worldwide popularity during protests in Hong Kong in 2014. Protesters coordinated their actions in messengers on mobile devices, and then authorities decided to restrict access to the Internet. In response, protesters created their own distributed network of smartphones without the Internet connection.

A well-known project for using distributed registries at the state level is e-Estonia, which granted Estonian residents access to a number of electronic services. A distributed registry connects the public and private sectors, as well as quickly and openly provides complex services.

Distributed registries have gained the greatest popularity with the use of blockchain technologies. A blockchain is a distributed database containing information about all transactions (communications) performed by all system participants. This information is stored as chains of blocks, each of which contains a certain number of communications. The first description of this technology was given in the article "Bitcoin: A Peer-to-Peer Electronic Cash System" (Nakamoto, 2018). Thus, this technology can transform any information in a chain of blocks. Each of these blocks contains information about other blocks, which allows distributing data across the system and tracking all the changes. There is no single place where the full list of system participants' records is stored since the registry is simultaneously used by all the system participants and is automatically updated to the latest version each time a change is made. Nowadays, there is a large number of varieties of this technology. The most known are the Bitcoin and Ethereum blockchains.

Although this technology was initially considered as an element of development in the information and financial spheres, now blockchain is gradually entering other spheres of human activity due to the high degree of security and confidentiality, and also because it allows reducing costs. In the past few years, trends in the development and implementation of blockchain technologies have been introduced not only into plans of research teams and business structures but have also been formulated at the level of senior officials from different countries, including Russia (Presidential Address to the Federal Assembly, 2018).

Positive characteristics of this technology have prompted researchers to address the main problems of democratic development through full transparency, direct voting and a new distributed management system (self-government) of society. Such notions as "online policy", "cyberocracy" (Ronfeldt, 1998) and others firmly enter the scientific language. New forms of democratic participation in politics emerge, including "e-democracy" (Electronic Democracy, 2009), "network democracy", "cyberdemocracy" and "digital democracy" (Prins, Cuijpers, Lindseth, Rosina, 2017). The most radical scientists consider blockchain as a "new state" or even predict the complete rejection of state power in the nearest future. Alongside loud statements in various countries, there are many ideas and ways of using it in different types of voting.

Methods

The methodology of this study is based on the dialectical approach with the use of general scientific and specific scientific methods of cognition and comprehension, including:

1) The formal-legal (dogmatic) method used to study the legal basis for using technologies of distributed registries and data chains, and to form scientific recommendations for improving the legislation on popular voting at various levels with due regard to the use of the above-mentioned technology.

2) The comparative legal method used to consider the existing approaches to organizing popular voting using

technologies of distributed registries and data chains, as well as the necessary legislative changes.

3) The method of legal modeling used to form recommendations on key aspects of the legal consolidation of technologies of distributed registries and data chains in popular voting.

Results

While analyzing theoretical constructions and application of the technology of distributed registries and data chains in popular voting, we concluded the following:

1) The use of technologies of distributed registries and data chains in such projects as Agora, Votewatcher, Follow My Vote and Voatz has many important technical characteristics that will effectively organize and conduct popular voting taking into account international legal standards and regulatory requirements established by national laws.

2) Blockchain-powered solutions available on the market even for completely electronic election protected by cryptographic methods preserve a control node capable of matching encrypted ballots with actual voters. Voting with the use of identifiers (some impersonal IDs) cannot guarantee absolute anonymity since states need to store appropriate registers of their values in order to ensure security.

3) The organization of election using blockchain and distributed registry technologies that retains all the key advantages, including the inability to make changes to the registry of transactions, the lack of control centers and full transparency, is possible only in voting that does not require secrecy as one of the basic conditions.

4) If it is necessary to ensure the secrecy of voting (for example, elections and referendums), it is possible to apply the technology of distributed registries and data chains at certain stages of organizing and conducting voting (as evidenced by the current practice considered in this article).

Discussion

Nowadays, a number of projects are actively developing decentralized voting platforms based on blockchain technology. Efforts are made to create an appropriate infrastructure to ensure the expression of will on corporate matters, to support activities of political parties and the process of voting in the framework of elections and referendums. Throughout the implementation of the Swiss project Agora (Agora Voting, n.d.), a real practice of conducting statewide election has been developed. In 2018, presidential elections in Sierra Leone were held with the use of this platform. It should be noted that Agora project did not directly participate in the election procedure on the part of authorized bodies, but it was an accredited international observer and conducted parallel counting of votes at 280 polling stations (Agora Official Statement Regarding Sierra Leone Election, 2018).

Agora architecture

The platform is based on the interaction of various technologies at five layers:

1) The first layer is the Bulletin Board blockchain based on Skipchain architecture that has high throughput and efficient transaction validation due to the use of long-distance links that allow to quickly access a particular registry entry in a logarithmic rather than a linear number of steps, providing proof of transaction validity without the need for a full record of the blockchain. Transactions are confirmed by nodes forming an authorized collective body (Cothority). Like in other blockchains, each network node contains copies of all transactions and confirms new transactions by including them in blocks, which supports the mechanism for achieving consensus in the network. Nodes independently control each other to ensure that the data recorded in the system remains unchanged.

2) The second layer is the Cotena transaction log connecting the Bulletin Board blockchain and cryptographic proofs with the Bitcoin blockchain, which ensures decentralized data immutability. The Cotena log is a list of Bulletin Board snapshots taken periodically over time. A copy of each log update is saved both by the Cothority nodes and on the Bitcoin blockchain. Together, the Bulletin Board and Cotena provide a hybrid blockchain configuration that achieves tamper-proof decentralization and protection against unauthorized access with low transaction costs and high data throughput.

3) The third layer is the Bitcoin blockchain. Due to its broad architecture, it is used for storing certain data that the system needs for full decentralization.

Currently, the Bitcoin network is one of the largest decentralized computer networks in the world; therefore, its blockchain is considered the most reliable and provides a high degree of data immutability. The Bitcoin blockchain enables anyone to verify that the Cotena log and Bulletin Board remain unaltered.

4) The fourth layer is the Valeda network, i.e. a decentralized network of trustless nodes that validate election results on the Bulletin Board blockchain. This layer serves to provide final public evidence that the Cothority has maintained the authenticity of Bulletin Board data and that election results are valid. This network consists of Citizen Auditor Nodes whose software computes cryptographic proofs pertaining to various processes of this platform including ballot recording, anonymization, decryption, tallying and more.

5) The fifth layer is Votapp applications, including Voting Booth, Audit and Node. The Voting Booth application allows authorized voters to participate in an election on Agora's network. This application downloads information from the election event's configuration file and displays relevant information, such as candidates and choices, to the voter. The voter is then able to select candidates and choices within their ballot, which is encrypted before being sent to the Bulletin Board blockchain. The Audit application provides an accessible toolset for auditing an election at all points throughout the election process. Auditing can also be performed on each layer of Agora's architecture as well. Anyone can run a full Node on Agora's network, which maintains a full history of our Bulletin Board and Cotena logs. Active participation in the network with the right to make entries to the registry (a Consensus Node is included in Cothority) is possible only in case of authorization as an Agora partner. During presidential elections in Sierra Leone, the Red Cross, the Lausanne High Technical School and the University of Freiburg were these operators. Moreover, anyone could observe the process through additional nodes that worked in "read-only mode" (Sierra Leone has become the first country in the world to hold a blockchain-powered presidential election, 2018).

Therefore, this set of technologies lets organize transparent voting while saving time and financial resources of both organizers and voters.

Stages of voting

The process of voting comprises the following six stages:

1. The configuration of a new electoral event. Administrators create a configuration file of new voting and indicate its main parameters: the list of officials and government bodies responsible for the organization of elections which are assigned a specific identifier; the type of voting and its parameters; date and time of the beginning and end of voting; voter lists (can be open or encrypted); the list of candidates or voting issues, as well as the necessary information about them; the list of observers; other specific parameters. When all the parameters are finally defined, a file with their data is entered into the Bulletin Board blockchain.

2. Voting and sending encrypted ballots of voters to Agora network. After identification, each voter who has the right to vote can get access to a virtual personal account through a voting device which includes personal devices (computers, smartphones) or specialized voting machines at polling stations. Once voters have made their choice, the transaction is carried out and their encrypted ballots are entered into the Bulletin Board blockchain.

3. The anonymization of ballot papers. All bulletins loaded onto the Bulletin Board blockchain go through a "mixed network", i.e. a collection of programs repeatedly encrypting each one of them and forming a new list of anonymous bulletins with zero identification in the Bulletin Board blockchain. For transparency purposes, only one network node is able to correlate encrypted ballots with real voters.

4. The decryption of anonymous ballots. To complete the counting process, Cothority nodes jointly decode anonymous bulletins and publish them with zero correctness arguments in the Bulletin Board blockchain. Election administrators can then verify the correctness of partially decrypted ballots and them to decipher anonymous source ballots that are published in the Bulletin Board blockchain where they can be counted.

5. Vote counting. Agora nodes count votes on all valid decoded ballots and publish results in the Bulletin Board blockchain. Agora,

administrators or any third party observing voting can check ballots. The party officially responsible for counting votes publishes the signed results in the Bulletin Board blockchain. Then the chosen auditors can verify the correctness of the results obtained before they are considered final. In turn, administrators determine which party will be responsible for the official counting of votes.

6. Audit. Controllers and observers confirm that the results are valid. Observers can be election administrators, voters and third parties located in any country. Audit nodes combined into Valeda network validate cryptographic evidence to provide decentralized and objective confirmation of election results. The possibility of an audit is provided at the stages of voting.

Thus, this set of technologies allows quite openly and effectively to conduct various kinds of voting, including nationwide elections. At the same time, administrative authorities are still present at all stages of the voting process, which is not fully correlated with the main idea of distributed registries. Nevertheless, actions of these bodies should comply with the principle of general transparency and simultaneous recording of data on different data storages. An advantage of this project is its flexibility in cooperation with government agencies and the abundance of possible settings for some electoral event, which helps effectively adapt to requirements of national legislation.

Existing practices

Blockchain-powered elections have been recently held at the municipal level in the Swiss city of Zug (Allen, 2018). In the framework of these elections, a new state identification system (eID) was tested. Citizens voted using a program for mobile devices specially developed by Luxoft and the Lucerne University of Applied Sciences and Arts and based on uPort identification application (uPort, n.d.). Different cantons of Switzerland are currently testing other electronic types of voting. In the future, Switzerland also plans to launch eVoting at the country level.

American company Blockchain Technologies Corp. developed a polling station Votewatcher (Cutting edge blockchain voting system, n.d.). Voting can be carried out in its traditional form with ballots, as well as via mail, e-mail or a special website. Ballot-based voting is conducted at five stages. The first stage is similar to ordinary voting: voters put the appropriate mark in their ballots. The only difference is that this paper has QR codes at the bottom for its identification: the first QR code contains blockchain address, the second one represents ballot ID, and the third one states voting ID. At the second stage, all bulletins are scanned using optical mark recognition to form data about each of them. At the third stage, each ballot goes through the process of "transaction", therefore information about its content is getting transmitted. At the fourth stage, this data is loaded into Florincoin blockchain, which allows adding a large amount of information, but has a lower degree of security. At the fifth stage, the hashed voting results for each ballot are loaded into Bitcoin blockchain characterized by a high degree of security. Thus, data are simultaneously stored in two registries, which significantly reduces the chances of falsification.

It is necessary to pay attention to certain shortcomings of this platform. First, the ultimate identification of voters should be conducted by state bodies, thus, theoretically, it will be possible to trace the connection between a specific person and their ballot, which could violate the most important principle of voting – secrecy. Second, the processing of ballots, the calculation of results and the loading of data into the blockchain is still connected with human labor and controlling bodies, which contradicts the very idea of distributed systems and throws into question their objective nature.

Nowadays, Votewatcher platform has conducted about twenty successful voting events (at the local level) where more than one million ballots were processed. "The Libertarian Party of the United States used this platform to elect candidates for inner-party positions in Texas... In total, 250 delegates took part in the "Texan" voting. Blockchain machines developed by Blockchain Technologies Corp. can, in the long run, compete with the counting machines used in the United States" (What's the use of blockhain-powered voting in politics and business, 2016).

Another American company Follow My Vote (Follow My Vote, n.d.) has also created and is currently developing its voting platform based on Bitcoin blockchain. Voting is conducted with an electronic platform that identifies voters through a webcam or state identifier. This platform is specific due to the ability of voters to observe the voting process online, as well as change their vote at any time before the official end of voting. Similar ideas were supposed to be implemented in the projects Boule (Boule, n.d.) and VotoSocial (VotoSocial, n.d.).

US-based company Factom (Factom, n.d.) declared it was ready to offer its infrastructure to governments so that they could develop decentralized and automated voting systems (Blockchain as a means of digital democracy. Experiments in Russia, Ukraine, the USA and Great Britain, 2016).

American company Voatz (Voatz, n.d.) provided its application and technical support for the Senate elections in West Virginia. About 144 military and foreign voters voted from 30 different countries using a blockchain-powered mobile voting application (2018 General Election: A Huge Success for West Virginia, 2018). Along with official IDs, Voatz application uses embedded face and fingerprint recognition on smartphones running iOS and Android for identification purposes.

Each ballot is identified and encrypted with a unique code, and then it is added to the blockchain based on private blockchain HyperLedger (this blockchain is free and funded by the Linux Foundation). To participate in an electoral event, each voter or auditor should be verified by a verifier (node). A pilot project in West Virginia used from sixteen to thirty-two verified sites divided in half between Microsoft Azure and Amazon AWS cloud servers. In the future, authorities can increase the number of nodes and determine which organizations (for example, political parties, universities, mass media, non-profit organizations, etc.) can be verifiers.

Russia is also working on blockchain technologies in the sphere of voting. The National Settlement Depository announced the creation of an e-proxy voting platform for electronic voting in corporate actions and document management that was successfully tested. The company's management noted, "After analyzing several options for applying blockchain to various spheres of the functioning of the National Settlement Depository, we decided to automate the voting of security holders at annual general meetings" (The National Settlement Depository has successfully tested a blockchain-based prototype of electronic voting, 2016). The corresponding software is available in the form of open source code on the GitHub website (Blockchain based voting system, n.d.).

It should also be noted that the Polys project (Polys, n.d.) supported by Kaspersky Lab aims to create a platform for conducting electronic voting for inner-party activities. The voting platform is based on Ethereum smart contract technology. For instance, elections to the youth parliament of the Saratov Region were held with the help of Polys. More than 15,000 voters took part in these elections.
A blockchain-powered platform for conducting various kinds of voting at the regional and municipal levels is planned to be created based on the "Active Citizen" application functioning for residents of Moscow.

In recent times, the possibility of using this technology has been often discussed on numerous scientific conferences (The scientific conference held by the Central Electoral Commission of Russia "Election. Today and tomorrow" has ended, 2018), as well as in speeches of officials. The corresponding plans are also mentioned in normative acts. Thus, the "Strategy for the Development of the Information Technology Industry in the Russian Federation for 2019-2025 and until 2030" states that the implementation of some initiatives can form a system for registering and calculating votes based on distributed access technologies.

Despite the positive features of this technology considered above, it is necessary to dwell on certain problems of its application in popular voting.

The identification of voters

Today the main problem is the identification of voters.

At the same time, there is still no absolutely reliable and proven digital identification technology that would be able to maintain the necessary level of confidence in elections. The rapid development of technologies makes it difficult to create a stable digital platform on a national scale. After the research conducted, neural networks based on machine learning technologies were able to instantly forge any fingerprints and face shapes. Furthermore, these algorithms based on the studied data are able to generate biometric information of non-existing people.

However, the technology under consideration can be introduced into the current electoral system with the traditional method of identification in the form of presenting an identity card to the person in charge, but this method of voting potentially has the risk of violating the principle of secrecy.

Ensuring the secrecy of voting

While considering different blockchain solutions available on the market, we highlighted that even an electronic voting format protected by cryptographic methods needs some control node capable of matching encrypted ballots with actual voters. Voting with identifiers (impersonal IDs) does not mean complete anonymity since any state can always have a register of their values for security reasons. "Regardless of how well a centralized electronic voting system is protected, it still remains extremely unsafe as any centralized and non-transparent computer system is mostly unsafe" (Kovic, 2017).

Science has also considered other problems associated with the use of this technology, including the possibility of the user's device being infected with a virus (Ayed, 2017) and voting by a third person. However, these problems are common to almost all types of digital communications.

Thus, voting based on the technology of distributed registries in general and blockchain in particular preserves all their key advantages, such as the inability to make changes to the registry of transactions, lack of control centers and full transparency, is possible only in election that does not require the secrecy of voting as one of the essential conditions. In this case, special attention should be paid to other institutions of direct democracy, including non-government lawmaking initiatives, citizens' appeals (collective ones), etc. At the same time, this technology can be effectively used at separate stages of elections and referendums, which will save time and financial resources.

Blockchain and lawmaking

Currently, many countries utilize e-democracy mechanisms aimed at the implementation of draft laws by citizens either directly to legislature bodies or through subjects of legislative initiatives. Since September 2012, the electronic system "We the people" (We the people, n.d.) has been operating that enables citizens to send written petitions to the President of the United States. In Great Britain, there is an e-democracy mechanism, E-Petitions (E-Petitions, n.d.), which allows initiatives to be submitted directly to the Parliament. Similar Internet resources also exist in Germany (Epititionen, n.d.), Scotland (E-Petitioner, n.d.), Russia (the Russian Non-Government Initiative, n.d.).

While implementing these legislative initiatives, citizens vote on their projects. We believe that voting with the use of the technology under consideration will, on the one hand, reduce the time and financial costs, and on the other hand, will form well-established requirements and practices (both legal and technical) for their further extrapolation to nationwide voting, including elections and referendums.

This technology is also used at the party level. One of the first applications of this technology in public election was voting on current issues of the Danish political party "Liberal Alliance" (Liberal Alliance, n.d.) at the annual convention. Based on the experiment results, the party's leadership came to the following general conclusion: this technology "eliminates the need for trust because it can work autonomously without human intervention and at the same time is completely open and transparent" (Borchgrevink, 2014).

A curious example is the Australian party "Flux" (The Flux Party, n.d.) that suggests introducing electronic voting for citizens based on cryptotechnologies. Scientists are particularly interested in the voting system that will enable citizens to vote for or against each bill considered in the country's parliament. Depending on the voting results, party deputies will vote at the meeting in one way or another.

Conclusion

Necessary to pay attention to state projects in certain countries on creating "smart legislation" platforms, which will allow the adoption of normative legal acts both in text form and in the form of program code in order to implement their individual norms directly into smart contracts and Internet infrastructure. The implementation of this concept will require the development of new approaches to the regulatory legal coverage of legislative procedures. The introduction of electronic ID cards is currently being implemented or tested in many countries. For instance, many countries use digital ID cards. In China, popular WeChat messenger is being tested as a method of identification. The identification of people according to their biometric data, such as the retina, face shape, voice, etc., is also actively developing. The technology under consideration can be introduced into the current electoral system with the traditional method of identification in the form of presenting an identity card to the person in charge.

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References:

2018 General Election: A Huge Success for West Virginia. (November 15, 2018). Retrieved January 30, 2019 from: https://sos.wv.gov/news/Pages/11-15-2018-A.aspx

Agora Official Statement Regarding Sierra Leone Election. (March 19, 2018). Retrieved January 30, 2019 from: https://medium.com/agorablockchain/agora-official-statement-regarding-sierra-leone-election-7730d2d9de4e

Agora Voting. (n.d.). Retrieved July 3, 2018 from: https://agoravoting.com

Allen, M. (2018). 'Crypto Valley' Zug to trial blockchain voting. Retrieved July 3, 2018 from: https://www.swissinfo.ch/eng/system-test_-crypto-valley--zug-to-trial-blockchain-voting/44177440

Ayed, A.B. (2017). A conceptual secure blockchain-based electronic voting system. International Journal of Network Security & Its Applications, 9(3).

Baran, P. (1964). On Distributed Communications. Retrieved July 3, 2018 from: https://www.rand.org/content/dam/rand/pubs/research_memoranda/2006/RM3420.pdf

Blockchain based voting system. (n.d.). Retrieved July 3, 2018 from: https://github.com/dsx-tech/e-voting

Blokchein kak instrument elektronnoi demokratii. Eksperimenty v Rossii, Ukraine, SShA, Velikobritanii [Blockchain as a means of digital democracy. Experiments in Russia, Ukraine, the USA and Great Britain]. (April 30, 2016). RosKomSvoboda. Retrieved March 1, 2017 from: https://rublacklist.net/16556/

Borchgrevink, J. (April 23, 2014). Blockchain voting used by Danish political party. Retrieved July 3, 2018 from: https://www.cryptocoinsnews.com/blockchain-voting-used-by-danish-political-party/

Boule. (n.d.). Retrieved July 3, 2018 from: https://www.boule.one/#about

Cutting edge blockchain voting system. (n.d.). Votewatcher. Retrieved July 3, 2018 from: http://votewatcher.com/

Electronic Democracy: ("e-democracy"). (February 18, 2009). Recommendation CM/Rec. Committee of Ministers of the Council of Europe and Explanatory Memorandum.

E-Petitioner. (n.d.). Retrieved March 1, 2017 From: http://www.parliament.scot/gettinginvolved/petitions/

Epititionen. (n.d.). Retrieved March 1, 2017 from: https://epetitionen.bundestag.de/

Factom official website. (n.d.). Retrieved March 1, 2017 from: https://www.factom.com/

Follow my vote. (n.d.). Retrieved July 3, 2018 from: https://followmyvote.com

Kak golosovanie na blokcheine nakhodit svoe primenenie v politike i biznese [What's the use of blockhain-powered voting in politics and business]. (November 28, 2016). Retrieved July 3, 2018 from: https://geektimes.ru/company/wirex/blog/281122/

Kovic, M. (2017). Blockchain for the people. Blockchain technology as the basis for a secure and reliable e-voting system. Zurich, Switzerland: ZIPAR Discussion Paper Series, 1(1), 20.

Nakamoto, S. (2018). Bitcoin: A Peer-to-Peer Electronic cash system. Retrieved July 3, 2018 from: URL: https://bitcoin.org/bitcoin.pdf

NRD uspeshno protestiroval prototip elektronnogo golosovaniya na osnove blokcheina // Natsionalnyi raschetnyi depozitarii [The National Settlement Depository has successfully tested a blockchain-based prototype of electronic voting]. (April 28, 2016). The National Settlement Depository. Retrieved July 3, 2018 from: https://www.nsd.ru/ru/press/pressrel/index.php?id36=628973

Ofitsialnyi sait politicheskoi partii "Liberalnyi Alyans" [The official website of political party "Liberal Alliance"]. Retrieved July 3, 2018 from: https://www.liberalalliance.dk/

Polys. (n.d.). Retrieved January 30, 2019 from: https://polys.me/ru/use_cases/political

Poslanie Prezidenta RF Federalnomu Sobraniyu RF [Presidential Address to the Federal Assembly]. (March 1 2018). The official website of President of Russia. Retrieved July 3, 2018 from: http://kremlin.ru/events/president/news/56957

Prins, C., Cuijpers, C., Lindseth, P.L., Rosina, M. (2017). Digital Democracy in a Globalized World. Northampton: Edward Elgar Publishing.

Ronfeldt, D. (1998). Cyborocracy is coming. Retrieved from: http://www.live.lived/sumeria/politics/sider.html

Rossiiskaya obshchestvennaya initsiativa [The Russian non-government initiative]. (n.d.). Retrieved March 1, 2017 from:

https://www.roi.ru
The Flux Party. (n.d.). Retrieved July 3, 2018 from: https://voteflux.org/about/how/
The official website "E-Petitions". (n.d.). Retrieved March 1, 2017 from: https://petition.parliament.uk/
uPort. (n.d.). Retrieved July 3, 2018 from: https://www.uport.me/#about
V Serra-Leone proshli pervye v mire prezidentskie vybory s ispolzovaniem tekhnologii blokchein [Sierra Leone has become the first country in the world to hold a blockchain-powered presidential election]. (March 9, 2018). Retrieved July 3, 2018 from: https://forklog.com/v-serra-leone-proshli-pervye-v-mire-prezidentskie-vybory-s-ispolzovaniem-tehnologii-blokchejn/
Voatz. (n.d.). Retrieved January 30, 2019 from: https://voatz.com
VotoSocial.org: towards an e-voting system that people can trust. (n.d.). Retrieved January 30, 2019 from https://medium.com/@jagbolanos/votosocial-org-towards-an-e-voting-system-that-people-can-trust-ad85be53be19
We the people. (n.d.). Retrieved March 1, 2017 from: https://petitions.whitehouse.gov/
Zavershilas nauchno-prakticheskaya konferentsiya TsIK Rossii "Vybory. Segodnya i zavtra" [The scientific conference held by the Central Electoral Commission of Russia "Election. Today and tomorrow" has ended]. (October 29, 2018). Retrieved January 30, 2019 from: http://cikrf.ru/news/cec/41020/