ISSN 2319 - 5975

Volume 13, No.2, February 2024 – March 2024

International Journal of Networks and Systems

Available Online at http://www.warse.org/IJNS/static/pdf/file/ijns021322024.pdf

https://doi.org/10.30534/ijns/2024/021322024

Secure and Decentralized Voting System using Block Chain Technology

[1]Prajwal S , [2]Navaneeth Surya P, [3]Rushikesh R Yaligar, [4]Nikhil Lobo

[1]Alvas Institute of Engineering and Technology, India. prajwalkkp03@gmail.com

[2]Alvas Institute of Engineering and Technology, India. nsurya5302@gmail.com

[3]Alvas Institute of Engineering and Technology, India. rushikeshry0202@gmail.com

[4]Alvas Institute of Engineering and Technology, India. nikhillobo1609@gmail.com

Received Date : January 13, 2024 Accepted Date : February 24, 2024 Published Date : March 07, 2024

ABSTRACT

In today's democracies, increasing restrictions due to the inconvenience of physically traveling to vote is a big problem. These recommendations support the development of remote electronic voting as a solution to increase voter turnout by eliminating the need for travel. The document demonstrates the effectiveness of remote electronic voting, noting that it not only speeds up results but also reduces the risks inherent in voting by ballot paper. The article acknowledges the important role of security, trust, and transparency in promoting confidence, arguing that the implementation of electronic elections in remote areas should be well possible in these areas, especially given the high risks associated with elections. The discussion also delves into the integration of blockchain technology and introduces the concept of block sealing, demonstrating its adaptation to meet the specific requirements of the election process. One of the main recommendations made is the adoption of a blockchain organizational model that provides ownership and oversight by the governing body. This governance model is seen as a measure that will increase accountability and increase public confidence in the integrity of elections. However, the document acknowledges that many challenges need to be addressed, including cybersecurity threats. He emphasized that legal, ethical, and social issues must be taken into account to maintain and strengthen public trust. The combination of new technology and a strong administrative foundation is considered necessary for the success of remote e-voting. This review concludes by advocating continuous research and development efforts to refine and fortify remote voting systems. The intricate interplay between technology, governance, and public perception emerges as a key focus for realizing the full potential of remote electronic voting in shaping the future of democratic processes. We present the wording utilized in blockchain-based existing ballot frameworks in this segment. They are sorted in light of the agreement calculations, blockchain system, cryptography, qualities of a fruitful framework, and the advancement instruments used to carry out blockchain e-casting ballot frameworks.

Key words: Block chain, Voting System, Secure, Integrity, Process

1. INTRODUCTION

As of late, far-off electronic democratic (e-casting a ballot) has arisen to increment elector turnout while permitting everybody to cast a ballot without the need to travel. On the one hand, the requirement to travel to vote has largely contributed to the steady rise in the rate of abstention. Then again, in numerous nations, the straightforward hardness of races is progressively tested and sabotaged [1]. In addition, it seems important, even necessary, to reevaluate the meetings in the current democratic process in a way that is direct, comprehensive, and close to the public, and to keep security at the highest level. Therefore, using blockchain technology to enable electronic voting seems like a good idea to overcome these problems. In the past, some countries have kept the site under limited jurisdiction but have refused to accept it until now. Similar to voting, it is still very difficult for the public to review and verify the vote without interfering with it. To solve these problems, blockchain introduces a new concept of contracts. Blockchain is an innovation, its maximum potential is still not understood and its applications are increasing [2]. Itwas first used for digital currency trading with the creation of the Bitcoin protocol in 2008. Due to its distribution, obscurity, and security, it has been approved by many companies that need innovation to store data without enteringa system. Trusted Stranger (TTP). In this article, we are interested in exploring those who are most motivated in electronic voting based on blockchain innovation, to understand their uniqueness and advantages over traditional methods.

2. 2.BACKGROUND OF THE RESEARCH

3.

4. Skepticism in elections is a common problem even in developing countries. Is voting with biometric authentication part of the solution? While some countries have adopted it, others have abandoned the practice due to security, transparency, and accountability concerns.

Biometric authentication could solve the huge problem of voter registration. This could increase public confidence in electronic voting. But challenges remain. In the past, electronic elections have faced the following problems: Hardware and software failure: Experiences in Estonia, Ireland, and Norway have highlighted the need for technology and rigorous testing. Fraudulent charges: India's electronic voting systems raise concerns about possible tampering. Measuring anonymity and accountability: Blockchain brings hope but also raises questions about public blockchain transparency and private blockchain oversight. Looking ahead, many aspects are important: Building safe and reliable technology and rigorously tested hardware and software are important. Ensure anonymity and accountability: Using encryption technology can facilitate anonymous voting when conducting audits. Transparency and public trust: Open communication, independent monitoring, and valid information are essential. The future of electronic voting is still uncertain, but its ability to increase accessibility and convenience should not be overlooked. By learning from past mistakes and implementing new solutions, evo ting with biometric authentication can become a safe and reliable option for

3. RELATED WORK

To take advantage of its advantages, blockchain technology has recently been announced as another specific basis for the development of many IT applications (new information), including e-leave a request. Of course, while the electronic voting rule was considered an old idea, with the freedom of blockchain innovation, it has now become a necessity. They begin by listing the problems facing the electronic voting app: protection, lack of evidence, buggy attacks, usability, flexibility, speed, and price. They looked at a set of voting papers that they believed covered every corner and laid a strong foundation. They did this by looking at 14 applications of 6 products, charting g whether and how each success met each base. Undoubtedly, this article does not have sufficient criteria to determine all electronic voting methods. This approach inspired our text, but we created a table for another approach by presenting animal names. Paper uses a method called “thoughtful planning.” It's about the difference between electronic ballots based on blockchain innovation. They divide apps into 5 categories, each expressing the main reason or main content of the app[3]. This classification is not sufficient and is not based on usage relationship. In our next article, we isolated some shared elements from most blockchain-based voting applications and then collected them by writing after 4 points and 4 tables (reserved elements) to reject the review process. Developers describe the use of blockchain-based electronic voting applications in real-world situations. They then isolated a set of things that an electronic voting application on the blockchain must meet to operate honestly, and fairly, and vote according to political decisions. These qualities include public and personal trustworthiness, reliability, stability, consistency, controllability, uncertainty, directness, diversity, adequacy, verification, and fairness. Therefore, they evaluated 8 blockchain-based voting platforms with their advantages and disadvantages compared to current products and suggested some updates. Our article uses strategies and targets comparable to those provided by manufacturers. The research on the topic presented in this article is quite interesting and our work is based on it. However, our work differs from the last option and therefore offers another way to approach the issue of blockchain-based electronic voting. Of course, our study completes this article, as we present nearly thirty more documents in our review. We are prepared to draw on background knowledge and use more decision-making processes than is suggested. In the last option, the developers detected some rejections that did not have a significant impact on our initial research, allowing us to learn other important information. We also rely on other research papers to administer and evaluate surveys. This allows us to collect both positive and negative results other than the results of election applications, thus gaining confidence. Although the general approach to investigating written orders is similar, the evaluation varies from person to person. In our article, the democratic cycle is initiated with each voting application. Additionally, the voting strategy is not specified. These differences allow us to think more broadly about how these electronic votes are made, leading to the curiosity of the electronic voting blockchain. Our documentation provides a complete and impartial audit. It is intended to be a link to all research on the subject. Our article not only analyzes the current regulations but also facilitates the m by taking into account certain measures important for electronic voting. We decided to incorporate as many blockchain-based voting applications as possible into our context through a process we specifically considered. In this regard, the study we have published will assist the authorities in the zero zone with the special rules and will examine some of the proposals of the application.

4.BLOCKCHAIN

Blockchain is a data exchange system implemented through a P2P network. It consists of a series of blocks, each containing a set of transaction proofs. These blocks are prepared according to the request sent to the blockchain. All relevant P2P partners or block controllers receive confirmed blocks and add them to the chain once the majority of official blocks have been confirmed. A product cannot be added or changed in the file without approval in any block. Additionally, information on the blockchain is irreversible and cannot be changed or deleted by any part of the organization. Blockchain combines the advantages of computational methods and cryptographic calculations to ensure the authenticity of the framework. The immutability of the blockchain, where no one can correct recorded changes, brings a new level of trust to the framework. There are three types of blockchains: hybrid, public or private. Public blockchains allow pseudo, anonymous users to join the organization, read the contents of the blockchain, submit new transactions or verify the authenticity of blocks, and participate in blockchain projects. A protocol cycle that receives new blocks. Examples of public blockchains are Bitcoin, NXT, and Ethereum. Public blockchains are decentralized and well-structured. A private blockchain

involves an organization that only allows users to join the organization and record or send transactions to the blockchain. Famous examples of private blockchains are Wave and Eris. While decentralization is an important part of blockchain, private blockchains will take a different approach to the collective process; here the body will agree to manage the information and the organization's ability to clarify the effectiveness of the framework (such as delivery). and delays in the exchange of consent. A hybrid blockchain is a combination of public and private blockchains, using permissioned and permissionless blockchains. Smart contracts allow users to access information and make immutable transactions even if the parent company owns the hybrid blockchain. Blockchains can be permitted or disallowed. There is no policy analysis and it is quite direct. However, the security of such a blockchain may be limited because a significant portion of it is available to the public. Blockchain permission only allows a group of miners to confirm transactions on the blockchain network. Consortium and private chains are considered permissioned blockchains because most miners need to ensure the existence of a hub to participate in the protocol loop. The consortium chain depends on a common system in which different organizations can participate and the consortium can choose among decentralized projects. A famous example of blockchain organization is Hyperledger Texture. Permissioned blockchains have higher security than permissionless blockchains and are more versatile due to multiple locations within an organization. Consent blockchains are decentralized to some extent, as different individuals may have different levels of consent.

5.TECHNICAL SPECIFICATIONS

Elector Recognizable Proof Techniques As we outline in Table 1, one of the classifications we had the option to seclude is the citizen confirmation techniques. For sure, a few validation strategies for the elector have been proposed in the papers of blockchain-based e-casting ballot applications. Some papers completely detail the confirmation technique while others just notice it rapidly, which is an issue. The issue of elector verification is crucial to guarantee that votes are not taken, sold, or coerced. Quite possibly of the greatest issues with e-casting a ballot is that we can't ensure great voting conditions, like the ideal classification of a democratic stall.

Biometric validation: it utilizes the finger impression, the iris of the eyes, or facial shape(criteria that can be joined). For public races, the main utilization of the telephone number to confirm the elector's personality is introduced in the paper [22]. This strategy for validation doesn't permit individuals who do not have a telephone membership to get to the vote. It additionally creates huge security openings by depending on confidential phone administrators to acquire residents' numbers. Concerning validation with an ID record, this poses security and adaptability issues. For sure, it is important for the framework to rapidly process the filtered duplicates of millions of clients and confirm that the personality documents compare to every client. If this check is automated, carrying out at a large scale can be extremely confounding. Also, the filtered duplicate would need to be taken in a flash to guarantee that it's anything but a cheat. In this manner, a more solid and quicker strategy for verification ought to be thought of. The most widely recognized verification strategy in blockchain-based e-casting ballot applications is the matching of a private furthermore, public key pair. The Elliptic Bend Computerized Mark Calculation (ECDSA) is regularly utilized. It proficiently guarantees the similarity of a vote cast by a client without uncovering his confidential key. This unbalanced cryptographic system is usually utilized in blockchain applications since it meets numerous security models. By the by, this strategy arrives at a cutoff that isn't negligible: the chance of selling or taking the confidential key of a client. Without a doubt, nothing keeps a client from selling his private key to an individual or an association that could project a huge measure of votes without risk of punishment. Another issue is the deficiency of the secret key [25]. If an elector loses his secret word, it is very complicated to safely relegate another. A programmer could change the client's secret key without his insight, which would be extremely tricky. The validation by open/confidential key is subsequently flawed and brings the chance of another more grounded technique: biometric validation.

6.EXECUTIONS UTILIZED

The different blockchain-based e-casting ballot applications share a similar general casting ballot interaction, from elector enrollment to the declaration of the outcome. In this segment, after momentarily expressing the overall activity of e-casting a ballot with blockchain innovation, we foster a few specialized elements of the different executions.

Steps involved in electronic voting using blockchain

1. Setting the Stage (Initialization):
    - Smart contracts are configured with foundational rules, and voter and candidate lists.
    - Registration may be required in some systems, while others rely on central authority keys.
2. Securing Voter Identity (Identification):
    - Voters authenticate themselves using secure methods on election day.
    - Dedicated websites or applications are often used, with a strong emphasis on avoiding mobile devices due to malware risks.
3. Casting Choices (Voting):
    - Verified voters make their selections as per the voting rules.
    - Selected choices are encrypted or hashed for protection and added to the blockchain.
    - Unique variations exist, such as allowing second votes, vote withdrawals, ranking candidates, abstention options, and delayed decryption.
4. Tallying the Data (Counting):
    - Once voting concludes, modifications or additions to votes are prohibited.
    - If counting occurs concurrently with voting, results are concealed to prevent undue influence.
    - Audits are conducted during this phase to ensure the integrity of the process.

5. Announcing Outcomes (Results):
   - Finalized results are securely communicated and made accessible to all involved parties.
   - The blockchain plays a crucial role in safeguarding vote confidentiality and integrity

7. DISCUSSION ABOUT E-VOTING

A] Try something different with e-voting Before blockchain, e-voting was used in Europe and around the world. Estonia, Switzerland, and Norway have introduced some electronic voting systems that do not use blockchain [19]. Electronic voting has been highly successful in Estonia and Switzer land, but in Norway, it has not been scaled back and was discontinued in 2014 due to security concerns. Recently in Estonia, at the last meeting of 2019, almost 44% of voters voted. Online voting is the best and shows the results of the voting process This bus is popular. But regardless of whether this test is valid or not, they do allow for public testing of electronic voting, which is not yet an issue with blockchain. They point to a flaw in the framework that may not solve this type of problem. In addition, it is important to ensure that these achievements remain together and d therefore depend on the flaws that the blockchain allows to reduce due to its decentralized nature. But worst of all, we need to be more careful in assessing the legality of the practice of electronic voting.

B] Lawful AND POLITICAL Contemplations FOR E-Casting a Ballot As a result of its institutional nature, e-casting a ballot must be considered from a lawful and political point of view [19].

(1) Legitimate Perspectives

The norms and guidelines of the different nations define the models and essentials for casting a ballot, whether it is on paper or then again on the web. In the review [19], it is expressed that any e-casting a ballot application must first conform to the key standards revered in the law. Hence, an immediate vote should be all-inclusive, fair, free, and, most importantly, secret. Aside from the standard of free democracy, which doesn't appear to be especially undermined by the e-vote [20], the other three should be thought about. Widespread testimonial implies that all grown-up residents are called to cast a ballot and have the valuable chance to do as such. Nonetheless, given the advanced gap brought about by the absence of fundamental PC abilities and Web association issues of many individuals (older however not just), numerous residents would be rejected from e-casting a ballot, which isn't OK. Enormous preparation of carefully tested individuals ought to in this manner be thought of as essential for e-casting a ballot, no matter what the innovation picked. We will return to this point toward the finish of this paper. Concerning the reasonableness of the e-vote, for example, if an elector is related to an interesting vote, it is likewise very difficult to guarantee contrasted with the paper vote. For sure, it is very difficult to check entirely the character of the individual who casts a ballot from a distance. All in all, nothing remains to be guaranteed that the individual who votes is the individual he professes to be. The subject of the validation arrangement of the citizen is subsequently fundamental, and we concentrated on it more exhaustively in segment IV. At long last, confidentiality is additionally one of the major standards of casting a ballot ensured by regulation. This standard relies significantly upon the execution and, what's more, the nature of the e-casting a ballot framework. We will perceive how blockchain meets this limitation especially well. Indeed on the off chance that an e-casting a ballot arrangement lives up to these assumptions, the creators of the report [26] determine that an advancement of the administrative structure of the nations wishing to set up an e-casting a ballot framework should be led.

(2) POLITICAL Perspectives

The decision to carry out e-casting a ballot has political results that can't be rejected from the examination. The Trust of all electors in the democratic framework is fundamental for the result of a political race to be viewed as legitimate. The fundamental inquiry of the straightforwardness of the democratic framework is consequently to be considered while picking a democratic innovation. This straightforwardness in paper casting a ballot is guaranteed by the physical counting of the voting forms, controlled and guaranteed by the residents. By and by, in non-majority rule nations, this straightforwardness standard is subverted when the voting forms are counted, and stowed away to the populace. E-casting a ballot ought to consequently resolve this issue furthermore, permit residents to perceive how votes are counted and how the framework works overall. This limitation likewise appears to be especially all around regarded by e-casting a ballot using blockchain. One shouldn't forget the financial expenses of creating and executing such a democratic innovation, as it includes public cash. The expense viability balance should be cautiously contemplated, so the framework isn't ill-fated to disappointment in the long haul. At last, the job of privately owned businesses in the execution of such a framework is a significant issue.

Throughout our investigation, we experienced various e-casting ballot applications created by confidential associations that offer intriguing developments. However, the obstruction of private organizations in a public vote brings up issues, both from a moral furthermore, political viewpoint [18]. Estonia has generally fostered its e-casting ballot innovations, however increasingly casting ballot tests have been led through an organization between privately owned businesses and states. Blockchain depends essentially on confidential speculation right now, so this question should be inquired.

Specialized Contemplations FOR E-Casting a Ballot When the lawful and political requirements have been laid out, we can now characterize the specialized limitations that an e-casting a ballot application should regard [21]. These limitations can be partitioned into two primary gatherings: those connected with the human and those connected with the innovation.

- Human-related limitations might incorporate the accompanying:

Have a simple to-utilize casting a ballot framework: convenience. Ensure residents that their vote stays mysterious

and that their character can't be followed from their vote: security and classification.

Demonstrate to residents that the democratic framework is working appropriately (i.e., demonstrate that votes are being counted, what's more, put away accurately): straightforwardness, review, and elector obviousness.

Forestall the mediation of an outcast to drive one more to cast a ballot with a specific goal in mind (i.e., forestallintimidation, extortion, constrained vote selling, and so forth): obstruction to compulsion. We note that this measure is complicated to apply without a democratic corner.Try not to oppress electors who can't or won't approach the Web by offering an option in contrast to e-casting aballot with their gadgets: qualification.

- Innovation-related requirements might incorporate the following:

Address the disparity of web access opportunities between various socio-segment gatherings. Certain individuals who right now have unfortunate web connections should have the option to cast a ballot.

Forestall any assault, framework disappointment, or association disappointment.

Thought of the conceivable presence of infections or malware on electors' PCs that could

(1) misshape the democratic choice and additionally

(2) influence the general Webcasting of a ballot framework.

Forestall numerous democratic. Among these limitations, the arrangement of broadband web access for all, or the chance of a paper elective are not straightforwardly connected with the democratic application yet to the general society expert responsible for the political decision. In any case, consistency with any remaining standards is principally the obligation of the e-casting of a ballot application. Some e-casting ballot applications appear to regard a portion of these imperatives, as displayed for instance by the Estonian decisions[28]. The EU is likewise directing pilot work toward this path to present a solid and dependable e-casting ballot framework [18]. In this article, we perceive how the blockchain may, or may not, address these limitations more really than additional generally involved advancements for e-casting a ballot.

D] Background and ongoing research Although blockchain-based e-voting is still in its early stages (less than 10 years), and some research background has been done on this model. The historical entry demonstrates the best way to digitalize European political decisions-making by implementing the proposed and tested strategy on the Ethereum blockchain. In another study, a new initiative by the nonprofit World Government Majority Office has introduced an electronic voting period in which Colombians abroad can vote in support of reconciliation. The content analysis in [27] describes various blocks of chain-based electronic voting applications deployed in West Virginia in 2018 for foreign members to participate in US-neutral decisions and many limited contests. The Russian city of Moscow is also using blockchain-based electronic voting for municipal decisions.

8.VOTING PROCESS:

Send the crowd to different levels. To create an effective block design process, it is important to know what the real application will look like. Guided by the decision, the Justice Commission and NADRA (public records and access authority) have important work to do. NADRA is Pakistan's leading public sector recruitment agency and is responsible for the recruitment and provision of personal information of Pakistan residents. NADRA ensures that the information of every citizen in the country can be used, such as the biometric information of every person [15]- [18]. On Election Day, biometric authentication is used to identify voters. The Justice Commission is responsible for issuing public appointment documents that cannot be recognized in the underlying documents. Thanks to new technology used to record and plan their votes, voters can vote according to the time allotted to them. The Board of Trustees is also required to publish results simultaneously with the station's group survey of the station and its group of registered voters. Advances in fitness include personal and new church foundations. We use Pakistan as a case study for the system [27]. In Pakistan, the public assembly is composed of 272 seats directly elected by the people. Each constituency has a certain number of polling stations that vary depending on the number of voters in the area (usuallyone polling station for every 1000 voters). Each facility is managed by a manager assisted by an assistant and some other staff. These responsibilities are given to everyone who works to inform the public and enable them to make their choices without fear or interference [29]. It allows the use of the e-democracy framework. The answers given in this article are based on electronic voting with voting machines and biometric verification of voters before they vote. Creating options is a systematic process that includes the following.

A) For the voter to enter the polling station to vote, which is his ultimate goal, his name must be included in the voter register. It is the citizen's responsibility to ensure that his or her name appears on the ballot when he or sheturns eighteen. This can be done by consulting an appropriate agency such as the National Database and Registration Authority of Pakistan (NADRA). Voting lists are published weeks before the elections. People whose names appear on the ballot have the right to vote but must identify themselves to election officials. Before voting, citizens must verify their identity through a biometric system. Voter data is analyzed with the help of the NADRA database.

b) Once the voter passes the certificate, it will be recorded on the ballot paper. Each candidate's name and personal message will be displayed on the democracy machine, and voters will be able to vote as they wish. The confirmation screen collects voters' votes and requests confirmation.

c) Voters can vote only once. When voting, the voting record will be individually set to "vote", preventing the voter from voting again. Once the voter elects him, his name may be blocked or removed from the list of eligible voters for regular elections. In his work on online voting, he introduced a system where voters could vote multiple times and each time

they voted, previous votes would be deleted. This does not seem to be a very viable option if the voting process is completed in one day and 110 million people vote, as in Pakistan.

d)The work will continue until the end of the democratic period or all citizens on the democratic list will have voted.

e) The influence of the rating site is clear and the votes received from each rising star are recorded. This process is repeated for each polling station in the voting population, and all results from each polling station are results for specific voters. Similarly, the results of all popular votes are added together to form the results of public political decisions. Explain the voting and results collection cycle.

9. CONCLUSION

Reduce the number of ways to manage assets on the blockchain by changing the protocol. A direct approach to the behaviors in the framework is often expected to gain success and trust from the public. Chain security measures have also been added so that the legitimacy of the chain is verified each time a new block is added to the chain. Smart rules play an important role in preventing splits and illegal transactions in blockchain voting. The proposed framework is a stable, simple, and reliable platform for both professionals and citizens. The proposed model is useful for determining the evaluation of blockchain innovation in VMS.

Scale transactions on the blockchain. Follow the evolution to reduce the number of ways to manage assets on the blockchain. A direct approach to the behaviors in the framework is often expected to gain success and trust from the public. Chain security measures have also been added so that the legitimacy of the chain is verified each time a new block is added to the chain. Intelligent systems play an important role in preventing fragmentation and transaction interference in blockchain elections. The proposed system is a safe, simple, and reliable platform for both professionals and voters. Considering the provable analysis of blockchain innovation in VMS, the proposed system is effective. The analysis shows that the framework continues to work well when processing large-scale transactions on the blockchain.

REFERENCES

[1].M. J. Beck and D. A. Hensher, **''Insights into the impact of COVID-19 on household travel and activities in Australia—The early days under restrictions,''** Transp. Policy, vol. 96, pp. 76–93, Sep. 2020.

[2]. D. Duenas-Cid, I. Krivonosova, R. Serrano, M. Freire, and R. Krimmer**, ''Tripped at the finishing line: The Åland islands internet voting project,''** in Proc. Int. Joint Conf. Electron. Voting. Cham, Switzerland: Springer, 2020, pp. 36–49.

[3] R. Krimmer, D. Duenas-Cid, and I. Krivonosova, **''New methodology for calculating cost-efficiency of different ways of voting: Is internet voting cheaper?''** Public Money Manage., vol. 41, no. 1, pp. 1–10, 2020.

[4] S. Park, M. Specter, N. Narula, and R. L. Rivest, **''Going from bad to worse: From internet voting to blockchain voting,''** J. Cybersecurity, vol. 7, no. 1, pp. 1–15, Feb. 2021.

[5] N. El Madhoun, J. Hatin, and E. Bertin, **''A decision tree for building IT applications,''** Ann. Telecommun., vol. 76, nos. 3–4, pp. 131–144, Apr. 2021.

[6] T. van der Meer, ``In what we trust? **A multi-level study into trust in parliament as an evaluation of state characteristics,''** Int. Rev. Administ. Sci., vol. 76, no. 3, pp. 517_536, 2010.

[7] D. Basin, H. Gersbach, A. Mamageishvili, L. Schmid, and O. Tejada, **''Election security and economics: It'sall about eve,''** in Proc. Int. Joint Conf. Electron. Voting, 2017.

[8] P. Bevelander and R. Pendakur, **''Electoral participation as a measure of social inclusion for natives, immigrants and descendants in Sweden,''** Tech. Rep., 2008.

[9] S. Wolchok et al., **''Security analysis of India's electronic voting machines,''** in Proc. 17th ACM Conf. Comput. Commun. Secur., 2010.

[10] B. Shahzad and E. Alwagait, **''Does a change in weekend days have an impact on social networking activity?''** J. UCS, vol. 20, no. 15, pp. 2068_2079, 2014.

[11] Z. Zheng, S. Xie, H.-N. Dai, X. Chen, and H. Wang, **``Blockchain challenges and opportunities: A survey,''** Int. J. Web Grid Services, vol. 14, no. 4, pp. 352_375, 2018.

[12] D. Johnson, A. Menezes, and S. Vanstone, **``The elliptic curve digital signature algorithm (ECDSA),''** Int. J. Inf. Secur., vol. 1, no. 1, pp. 36_63, Aug. 2001.

[13] J. Barcelo**, ``User privacy in the public bitcoin blockchain,''** J. Latex Class Files, vol. 6, no. 1, p. 4, 2007.

[14]A. Biryukov, D. Khovratovich, and I. Pustogarov, **``Deanonymisation of clients in bitcoin P2P network,''** in Proc. ACM SIGSAC Conf. Comput. Commun. Secure., New York, NY, USA, 2014.

[15]A. Rasul and S. D. McDowell, **``Consolidation in the name of regulation: The Pakistan Electronic Media Regulatory Authority (PEMRA) and the concentration of media ownership in Pakistan,''** Global Media J., vol.11, no. 21, pp. 110_121, 2012.

[16]S. K. Mohmand, **``Patrons, brothers, and landlords: Competing for the vote in Rural Pakistan,''** Ph.D. dissertation, Univ. Sussex, Brighton, U.K., 2011.

[17] S. Baig, U. Ishtiaq, A. Kanwal, U. Ishtiaq, and M. H. Javed, **``Electronic voting system using Fingerprint matching with Gabor _lter,''** in Proc. Int. Bhurban Conf. Appl. Sci. Echnol. Islamabad, Pakistan, 2011, pp. 130_135.

[18] N. Yaser, N. Mahsud, and I. A. Chaudhry, **``Effects of exposure to electronic media political content on voters voting behavior,''** Berkeley J. Soc. Sci., vol. 1, no. 4, pp. 1_22, 2011.

[19] Embracing "**Innovation in Government_Blockchain Voting for Peace in Colombia".** (Dec. 23, 2021). [Online]. Available: https://www.oecd.org/gov/innovative-government/embracinginnovation-

[20] "**West Virginia Secretary of State's Office. 24 Counties to Offer Mobile Voting Options for Military Personnel Overseas".** (Dec. 23, 2021). [Online]. Available: https://sos.wv.gov/news/Pages/09-20-2018-A.aspx

[21] "**Offcial Website of the Mayor of Moscow".** (Dec.23,2021). Available:https://www.mos.ru/news/item/58866073

[22] C. Osborne. (2018). **"Japanese City Trials Blockchain to Replace Traditional Voting Booths".** (Dec. 23, 2021). [Online]. Available: https://thenextweb.com/news/japan-city-blockchain-voting(2022).

[23]**"Voting DAO Announces Upcoming Inaugural Blockchain Person of the Year Decentralized Voting Event".** (Jan. 15, 2022).

[24] X. Yang, X. Yi, S. Nepal, A. Kelarev, and F. Han, **``Blockchain voting: Publicly variable online voting protocol without trusted tallying authorities,''** Future Gener. Comput. Syst., vol. 112, pp. 859_874, Nov. 2020.

[25] M. Chaieb and S. Yous_, **``Loki vote: A blockchain-based coercion resistant E-voting protocol,''** in Proc. Eur., Medit., Middle Eastern Conf. Inf. Syst. Cham, Switzerland: Springer, 2020.

[26] D. Khoury, E. F. Kfoury, A. Kassem, and H. Harb, **``Decentralized voting platform based on Ethereum blockchain,''** in Proc. IEEE Int. Multidisci- plinary Conf. Eng. Technol. (IMCET), Nov. 2018.

[27] R. Hanifatunnisa and B. Rahardjo, **``Blockchain based E-voting recording system design,''** in Proc. 11th Int. Conf. Telecommun. Syst. Services Appl. (TSSA), Oct. 2017.

[28] H. Yi**, ``Securing E-voting based on blockchain in P2P network,''** EURASIP J. Wireless Commun. Netw., vol. 2019, no. 1, pp. 1_9, Dec. 2019.