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Public Perception of Voting Systems Evaluating Trust in Traditional vs. E-Voting

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Abstract: ***This paper examines the public attitude toward traditional and e-voting systems especially the trust that people have in them. With the continued advancement of digital technologies within democracies, issues of security, inclusiveness, and credential of voting systems measures have raised public discussion among voters, policy-makers and academics .The results show that traditional voting methods are popular because of their widespread presence and that there are trends to enhance the status of electronic voting., the E-voting systems are met with a lot of scepticism and this blamed on issues to do with cybersecurity, privacy and in overall technical security concerns, and reliability of e-voting systems have prompted debate among voters, policymakers, and academics. Several factors, including education level, age, and previous experience with technology in everyday life, may influence voter preferences and perceptions. To increase public confidence in voting, more convincing practical steps should be put in place around transparency, security technologies, and public education.***
Furthermore, this paper contributes to the debate on the continued modernization of electoral systems while emphasizing and increasing public confidence in the electoral process.
Keyword: voting systems, e-voting, traditional voting, trust, transparency.

I. BACKGROUND AND IMPORTANCE OF VOTING SYSTEMS

The voting systems are foundational to democratic governance, as they facilitate citizen participation and ensure that diverse public opinions are transformed into binding political decisions. Traditional voting methods face significant challenges, including lack of transparency, susceptibility to fraud, Geographical Constraints and operational inefficiencies. The integration of innovative technologies, With the rapid and great development in technology, there has been an integration, development of many technological tools., is emerging as a solution to enhance the security, efficiency, and transparency of voting processes.
The Voting systems are crucial as they determine how representatives are elected, influencing governance and societal development by reflecting the electorate's preferences and ensuring accountability in democracy.[1] and crucial for democratic integrity, ensuring fair representation and public trust, while addressing issues like fraud and security to enhance electoral processes globally.[2]
Voting systems are essential for democracy, ensuring transparency and fairness whereas the existing voting systems are unreliable and susceptible to abuse. ; however, traditional methods face distrust and abuse, highlighting the need for innovative solutions to enhance security and integrity.[3] as low trust can hinder engagement and negatively impact human-computer interactions, ultimately affecting election outcomes.[4]

A. Research Objective and Scope

Public perception of voting systems, Especially with regard to trust in traditional and electronic voting systems, it reveals security concerns, but there are possible solutions. Voting in traditional systems is often marked by a lack of transparency and manipulation, Casting of votes traditionally is commonly compared to be slow, cumbersome, and for a long time has been associated with some degree of rigging in the voting process[3]. resulting in a widespread distrust of voters. On the other hand, electronic voting — Even when coupled up with blockchain technology is still a better one, as it has promising features that can increase transparency and security which then may be able to restore their trust in the voting system.
The paper emphasizes that the sense of democracy comes through trust in the electoral process, by emphasizing security issues and encouraging the development of transparent and reliable electoral systems that will enhance voter participation.[5]
E-voting systems can pose to enhance the rate of the entire electoral process and the accessibility to participate in the electoral[6]The paper aims to evaluate the current level of public confidence in traditional and electronic voting systems,Where The systems of voting are vulnerable to compromise and are generally untrustworthy.

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II. TRADITIONAL VOTING SYSTEMS DEFINITION AND TYPES

Traditional voting systems require physical presence at polling stations[7]. Traditional voting systems rely on physical ballots and manual counting [8].

A. Traditional Voting Systems

System has its own advantages and challenges, influencing their effectiveness and public trust. Understanding these system is crucial for evaluating their role in democratic processes.

Paper ballot systems

Is a method where voters mark their choices on paper ballots, which are then counted manually.Traditional voting typically involves paper ballots and physical polling stations.

Advantages

- Tangible evidence of votes, which can be recounted if necessary.
- Simplicity and familiarity for voters.

Challenges

- Resource-intensive due to the need for physical materials and personnel for counting.
- Susceptible to fraud, such as ballot tampering and booth [9].

B. Advantages and Limitations of Traditional Voting Systems

1) Advantages And Limitations Of Traditional Voting Systems

- Auditable Papers: Elections conducted using paper ballots expose auditable paper that can be used to further lessen statutory electoral fraud abuse.
- Technology Accessibility Challenges: Simply put, paper voting is unlikely to be very influenced by technical failure or hacking tactics directed against electronic ballots systems[11]
- More Secure: A great number of voters appreciate paper ballots as they are more acquainted with them and do not believe they can be changed so easily[12]
- Established Framework: Conventional voting systems are trusted by the majority. The system is also easy to implement and can build trust among voters.
- Accessibility for Some: that although most people have problems using modern methods, such individuals are able to engage in voting by employing traditional practices and they do not face challenges [13]
- Legal Protections: aimed Institutions at securing voter interests and increasing the participation of underrepresented populations, improving representation ,all this is done by emphasizing the laws of the right to vote[14]

2) Limitations and drawbacks of Traditional Voting Systems

- Security Concerns: Traditional voting systems are more vulnerable to fraud and manipulation due to the challenges that may exist in the life cycle of the electoral process. [13]
- Inefficiency: The slowness of the traditional electoral process in all its stages can lead to slow voter turnout and the entire electoral process[15]
- Susceptibility to physical tampering: Being a physical entity, paper ballots are also vulnerable to alteration and or solicitation and destruction [16]
- Limited Accessibility: Paper Voting is likely to disadvantage some categories of especial individuals such as old people or people living in rural areas and disabilities .[17]

III. E-VOTING SYSTEMS OVERVIEW AND TYPES

E voting Solutions are a new way of making elections and represent a far more efficient method, using technology to ease the casting of vote. These systems hold the potential to improve efficiency, accessibility, and accuracy to conventional methods. But they also bring security, privacy and integrity challenges. Here is a description of the different types of e-voting system and their characteristics. All these systems advance the practice of democracy given that improving efficiency processes ,accessibility and greater accuracy of results while at the same time sparking doubts concerning the transparency, privacy, integrity, and security.[18]

They increase accessibility, decrease crowding and increase the efficiency in counting of the votes thereby allowing voters from remote areas to vote while while ensuring voter authentication and security.[19]

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Types of E-Voting Systems

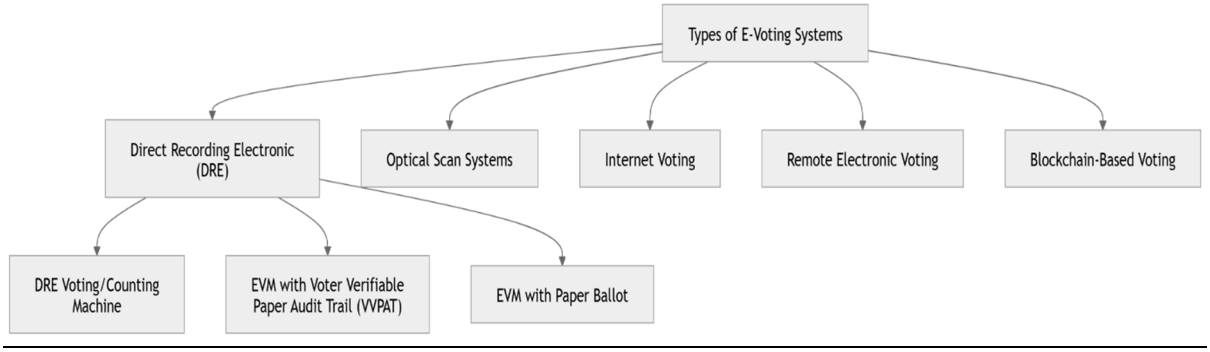

Fig 1: Types of E-Voting Systems

Direct Recording Electronic (DRE) Systems—Allow voters to vote directly on an electronic voting machine that electronically records votes. They make it easy for users but have issues regarding security and audit [18]
Electronic voting machines (EVMs): Digital devices that allow voters to cast their votes electronically, examples:

- DRE voting/counting machine
- EVM with voter verifiable paper audit trail (VVPAT)
- EVM with paper ballot.

Optical Scan Systems: Voters vote by using paper ballots where all results are electronically read by machines. This method merges the paper with the electronic counting system in such a way that it seems more familiar than the completely electronic counting[18].
Internet Voting: This system also allows voters to vote through the Internet in order to make the process more convenient and increasing accessibility. However it carries great risks of hacking as well as scams [20].
Remote Electronic Voting: Like internet voting, this enables voters to cast their votes from distant places, mostly through secure networks. Especially for expatriates or people who cannot personally vote as it is also called [18]
Blockchain-Based Voting: New technologies like the blockchain provide higher levels of security and the availability of the overall data. Hoe s work on these systems to provide vote integrity through decentralized ledgers and to prevent fraud[21]
Security Considerations: Biometric Authentication: Certain systems have employed the use of fingerprint scanning in order to assure security which would otherwise be compromised by impersonation[22].
Cryptographic Techniques: Most cryptographic techniques such as asymmetric key cryptography, elliptic curve cryptography are important to defend against complications such as ballot stuffing and denial of service attacks during the online voting systems(23).
E-voting systems benefit from many technologies; however, implementing e-voting systems poses considerable challenges especially in the two areas of security and acceptability. The issue of how open these systems should be while maintaining their integrity is a fundamental consideration in their current development.

A. Benefits and Concerns

Systems of electronic voting are being viewed in the context of today's electoral methods, as they have many advantages as well as numerous criticisms. These systems make voting more accessible, secure and efficient and at the same time these systems are confronted with issues of privacy and cybersecurity. The subsequent sections are an elaboration of the Benefits and risks connected with the use of e-voting systems.

1) Benefits of E-Voting Systems

Increased Accessibility: E-voting allows individuals to cast their votes from any location with internet access, promoting higher voter turnout[18]
Improved Efficiency: E-voting systems enhance efficiency, reduce errors, and promote broader participation[24] by allowing voting from any location with internet access.[19]
Enhanced Security :Blockchain-based e-voting systems ,decentralized control and encryption, enhance security transparency, and trustworthiness, addressing traditional e-voting challenges reducing the risk of manipulation. [25]

2) Risks connected E-Voting Systems

Cybersecurity Risks: Problems associated with e-voting include vulnerable to hacking and cyberattacks that threatens the electoral process[18].

Privacy Issues: The problem of anonymity of the voter and yet being able to verify the authenticity of the voter also becomes a challenge as there is no compatibility between transparency and privacy needs in blockchain.[25]

Trust and Acceptance: the public may not trust evoting that makes it difficult to adopt the systems, hence a need for intensive public awareness creation[18].

As much as e-voting systems pose significant change possibilities with regard to electoral processes, the question as to whether e-voting systems are safe enough still remains. It is crucial to overcome these challenges in order to have voters faith in the e-voting process.

IV. TRUST FACTORS IN TRADITIONAL VOTING SYSTEMS

The elements of trust in the Traditional systems are important to enable voters to participate as well as have confidence in voting processes. They include transparency, security, and the Iteegrity of electoral bodies. Knowing these trust factors is crucial toward enhancing the voting systems and enhancing democracy.

1) Dimensions of trust in Traditional voting system

Transparency: Citizens should feel that the process of the voting is transparent and comprehensible. The main idea is that the increased transparency in design and implementation can improve the confidence in the Evoting systems traditional methods[26].

Security: The security of voting systems is very important. People have to trust that appropriate measures have been taken, and it is believed that anxiety about security issues affecting the results affects confidence. It is important to estimate the level of security of a given system depending on the trust relations between such parties[27].

Institutional Integrity :One of the most important criteria for confidence in electoral bodies is institutional design and political culture. which may either foster the growth or not of trust . Research in Latin America indicates that people's trust in electoral institutions is a determinant of the quality of democracy[28].Conversely, sceptical attitudes towards the voting systems can be caused by previous electoral failures or perceived biases, which will lead to less political participation rates and democratic issues.

There are key trust factors that influence voter confidence in traditional voting systems

The perception of traditional voting systems among the voters consist of by several key trust factors, which are very important for the credibility of the elections. Knowledge of these factors can go along way in participation voters and Confidence on electoral processes. The following sections outline the primary trust factors affecting voter confidence. The following sections outline the primary trust factors affecting voter confidence.

2) Voting Experience

Citizens who receive a negative vote experience complained of low confidence in the event[29].

that while mail-in voting is convenient, it results in voters feeling less confident that their vote had been correctly counted than voters who vote in person[29].

3) The Factors that defines Election Security from the voters perspectives

Human being heeds better election security policies as improve the voters' confidence trusting that adequate measures decrease the rates of fraud[30].

There is inverse relationship between perception of fraud and voter confidence; the higher the perceived fraud rate the lower the confidence in elections[30].

4) Trust in Voting Technology

Knowledge of voting technology increases the confidence level; in voting the public has more confidence on the paper based voting as compared to the electronic voting[31].

The use of measures such as the Trust in Voting Systems (TVS) measure enables the identification of concerns from the voters about various voting methods[4].

Conversely, these factors are conducive to the voters' confidence in the most part, although some research indicates that increased consciousness of fraud, sometimes caused by the media feed, may indirectly reduce trust in the electoral process[29][30].

A. *Trust Factors in E-Voting Systems*

The aspects of trust in e-voting systems are important to guarantee the voters' confidence in electoral processes. Such factors contain a number of technological, organizational psychological aspects, which determine perception and acceptance of electronic voting to the general public. It is for this reason that it is important that these trust factors are comprehended in order to foster the uptake and effectiveness of the e-voting systems.

1) Technological Trust Factors

Blockchain Integration: In e-voting systems, blockchain technology brings improvements in aspects which are important in increasing the credibility such as transparency, immutability and securit this is important in enhancing voter confidence.[32].
Secure Authentication: Other technologies such as Near Field Communication (NFC) also offer ways of safe voter identification in the system adding confidence to system [33].
Trust factors in E-Voting Systems include: Transparency, Secure Authentication and integrity of the process. These factors are improved by the combination of blockchain and NFC because it makes the data to be immutable secure voter identification, and reliable verification to boost confidence in the election results.[33]

2) Organizational Trust Factors

Government Credibility: It is recommended to have the level of public trust is closely rooted within the government carrying out the e-voting system and its overall integrity and credibility[34].
Public Education: Explaining to people the fact that this technology is safe and useful is the best way to avoid multiple fears and misconceptions regarding e-voting[32].

3) Psychological Trust Factors

Voter Perception: E-voting is also influenced by the psychological attitudes towards technologies and perceived social risks and dangers of their application[34][4].
Trust in Voting Systems Measure: Special indicators to define the level of trust in voting systems play an important role in identifying components that need to be refined and enhance knowledge of the voters' concerns[4].
Technological advancement is believed to act as a sure way of encouraging trust in e-voting systems, but there are various instances of fraud, and these are relatively new technologies. In this respect, it is addressing to achieve enumerated concerns systematically so as to establish the reliable electoral climate.

V. CONCLUSION

With regard to voter perceptions of traditional versus E-voting systems, there is a complex situation caused by technology, transparency, and voter experience. While traditional voting methods have always been criticized for lack of transparency and potential fraud, electronic voting systems have their potential as well as their challenges in terms of trust-building activities.

1) Trust in Voting Systems

Traditional voting methods generally face challenges due to a history of overt fraud and manipulation that can lead to a lack of trust among the electorate [3].

2) Perception of Electronic Voting

Electronic voting is more acceptable due to greater convenience and efficiency. Several studies indicate that voters find it easier to use electronic voting methods[35].
However, concerns about the secrecy of the ballot and the reliability of electronic systems are likely to grow, particularly among older people and those with low levels of technology adoption who are often sceptical of the trust worthiness of technology[35][36].

3) Technology in Building Trust

Integrating for e-voting systems has been proposed to incorporate technology of blockchain, which could contribute to strengthening the security and transparency , therefore, the trust of the public[3]. However, while e-voting systems introduce innovative ideas, they tend to create concerns related to accessibility and the digital divide that could all make it more challenging for public to trust the electoral process.

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VI. RECOMMENDATIONS FOR FUTURE RESEARCH

It is important to recognize that there are factors that influence voter trust that, in turn, enhance participation in the democratic process. As such, future research should focus more on several key aspects to help understand public attitudes toward voting systems

A. Trust Measurement Development

The Trust in Voting Systems (TVS) measure could also be refined to assess trust by demographic characteristics and voting methods, giving a better sense of voter confidence.Future research should further investigate how traditional and electronic voting systems affect levels of trust, especially across different demographic groups.

B. Technological Solutions

The application of blockchain in voting systems have possibilities of updating the current systems, making it more secure and transparent thus attaining the voters confidence

Integration with NFC: Blockchain Merge with Near Field Communication (NFC) can give the assurance of authentication, enhancing the security of e-voting systems.

The integration of blockchain and NFC in e-voting will certainly enhance trust and security in a clear and tangible way in the integrity and reliability of e-voting systems.

REFERENCE

[1] M. A. Gado, “VOTING IN DEMOCRACY: AN INSTRUMENT OF HUMAN DEVELOPMENT,” European Journal of Political Science Studies, vol. 0, no. 0, May 2019.
[2] Ashish Balti, A. Prabhu, M. Kamal, Shrutika Dahifale, and V.D. Maheta, “A Decentralized and Immutable E-Voting System using Blockchain,” Jun. 2023.
[3] Noor Ahmed and Prof. Anupama Pattanasetty, “Online Voting System,” Journal of Scientific Research and Technology, pp. 41–58, Mar. 2024.
[4] C. Z. Acemyan, P. Kortum, and F. L. Oswald, “The Trust in Voting Systems (TVS) Measure,” International Journal of Technology and Human Interaction (IJTHI), vol. 18, no. 1, pp. 1–23, 2022.
[5] M. STOICA, “E-Voting Solutions for Digital Democracy in Knowledge Society,” Informatica Economica, vol. 20, no. 3, pp. 55–65, 2016, Accessed: Oct. 28, 2024. [Online]. Available: https://ideas.repec.org/a/aes/infoec/v20y2016i3p55-65.html
[6] Ayush Abhigyan, S. Ghosh, and R. Brindha, “Strategic Integration of Blockchain Technology to Establish a Robust and Secure E-Voting System,” Jun. 2024.
[7] Ksenia FILIPCHUK, “Electronic elections as the newest transformational phenomenon of modern legal reality,” Bulletin of Lviv Polytechnic National University. Series: Legal Sciences, pp. 297–302, 2023, Accessed: Oct. 28, 2024. [Online]. Available: https://science.lpnu.ua/law/all-volumes-and-issues/volume-10-number-3-39-2023/electronic-elections-newest-transformational
[8] L. Babenko and Ilya Pisarev, “E-Voting System Based on Multiple Ballot Casting,” Advances in intelligent systems and computing, pp. 89–97, Jan. 2020.
[9] S. Rohit and V. Nikhare, “A Comparative Analysis of Traditional versus Blockchain-based Voting Systems,” 2023 14th International Conference on Computing Communication and Networking Technologies (ICCCNT), pp. 1–7, 2023.
[10] “Fact Sheet: Electronic Voting Machines | IFES - The International Foundation for Electoral Systems,” Ifes.org, Feb. 05, 2024. https://www.ifes.org/publications/fact-sheet-electronic-voting-machines (accessed Nov. 16, 2024).
[11] F. H. F. Botelho, “Accessibility to digital technology: Virtual barriers, real opportunities,” Assistive Technology, vol. 33, no. 1, pp. 27–34, Dec. 2021.
[12] “Voters have more confidence in an accurate vote count in their own state or locality than nationwide - AP-NORC,” AP-NORC -, Nov. 2024. https://apnorc.org/projects/voters-have-more-confidence-in-an-accurate-vote-count-in-their-own-state-or-locality-than-nationwide/
[13] W. Salman, V. Yakovlev, and S. Alani, “Analysis of the traditional voting system and transition to the online voting system in the republic of Iraq,” 2021 3rd International Congress on Human-Computer Interaction, Optimization and Robotic Applications (HORA), Jun. 2021.
[14] W. Rule and Joseph Francis Zimmerman, Electoral systems in comparative perspective : their impact on women and minorities. Westport, Conn.: Greenwood Press, 1994.
[15] Metatags generator, “View of Innovative Solutions for Democratic Processes: A Case Study on Secure JNEC Voting System,” Jnec.edu.bt, 2024. https://journal.jnec.edu.bt/index.php/jaetm/article/view/123/58 (accessed Nov. 19, 2024).
[16] B. Yamini, K. Renuka, M. Anuradha, J. J. Justus, M. Nalini, and Chitra Devi D, “Secured Voting System based on Blockchain,” Aug. 2023.
[17] R. Kumar, L. Badwal, S. Avasthi, and A. Prakash, “A Secure Decentralized E-Voting with Blockchain & Smart Contracts,” IEEE Xplore, Jan. 01, 2023. https://ieeexplore.ieee.org/document/10048871
[18] Ghizlane Ikrissi and Tomader Mazri, “Electronic Voting: Review and Challenges,” Lecture notes in networks and systems, pp. 110–119, Jan. 2024.
[19] Prof. V. Verma, “Online Voting System,” International Journal for Research in Applied Science and Engineering Technology, vol. 12, no. 5, pp. 1150–1153, May 2024.
[20] “Internet Voting,” Verified Voting. https://verifiedvoting.org/internetvoting
[21] P. Sharma, A. Gupta, A. D. Pandey, A. S. Negi, K. V. Mishra, and R. Garg, “E-Voting Based Upon Blockchain System,” pp. 157–163, May 2024.
[22] V. K. Mishra, M. Mishra, and S. Khan, “Use of Synthetic Signature Images for Biometric Authentication and Forensic Investigation,” International Journal of Biometrics, vol. 1, no. 1, p. 1, 2023.
[23] U. Devi and S. Bansal, “Secure e-Voting System—A Review,” Lecture notes in networks and systems, pp. 1209–1224, Jan. 2023.

[24] "Online Voting System using Blockchain Technology – IJSREM," Ijsrem.com, 2024. https://ijsrem.com/download/online-voting-system-using-blockchain-technology/
[25] M. Hajian Berenjestanaki, H. R. Barzegar, N. El Ioini, and C. Pahl, "Blockchain-Based E-Voting Systems: A Technology Review," *Electronics*, vol. 13, no. 1, p. 17, Jan. 2024.
[26] A. Antoniou et al., "A Trust-Centered Approach for Building E-Voting Systems," Lecture notes in computer science, pp. 366–377, Aug. 2007.
[27] K. Krips, N. Snetkov, J. Vakarjuk, and J. Willemson, "Trust assumptions in voting systems," arXiv.org, 2023. https://arxiv.org/abs/2309.10391
[28] G. Rosas, "Trust in elections and the institutional design of electoral authorities: Evidence from Latin America," *Electoral Studies*, vol. 29, no. 1, pp. 74–90, Mar. 2010.
[29] R. M. Alvarez, J. Cao, and Y. Li, "Voting Experiences, Perceptions of Fraud, and Voter Confidence," *Social Science Quarterly*, vol. 102, no. 4, pp. 1225–1238, Mar. 2021.
[30] J. A. Coll, "Securing Elections, Securing Confidence? Perceptions of Election Security Policies, Election Related Fraud Beliefs, and Voter Confidence in the United States," *Election Law Journal: Rules, Politics, and Policy*, vol. 23, no. 2, pp. 173–192, Jun. 2024.
[31] R. Smith, "Confidence in paper-based and electronic voting channels: evidence from Australia," Australian Journal of Political Science, vol. 51, no. 1, pp. 68–85, Jan. 2016.
[32] S. Negash, "Improving eGovernment Services with Blockchain: Restoring Trust in e-voting Systems," Communications in computer and information science, pp. 265–275, Jan. 2022.
[33] "Enhancing Trust and Security in E-Voting: A Comprehensive Review of Blockchain and NFC Integration," Ijraset.com, 2024. https://www.ijraset.com/research-paper/enhancing-trust-and-security-in-e-voting (accessed Nov. 05, 2024).
[34] H. Ali and H. Al Mubarak, "e-Voting," International Journal of Electronic Government Research, vol. 14, no. 2, pp. 12–27, Apr. 2018.
[35] R. M. Alvarez, I. Levin, J. Pomares, and M. Leiras, "Voting Made Safe and Easy: The Impact of e-voting on Citizen Perceptions," Political Science Research and Methods, vol. 1, no. 1, pp. 117–137, Jun. 2013.
[36] E. Beaulieu, "Electronic Voting and Perceptions of Election Fraud and Fairness," Journal of Experimental Political Science, vol. 3, no. 1, pp. 18–31, Jul. 2015.

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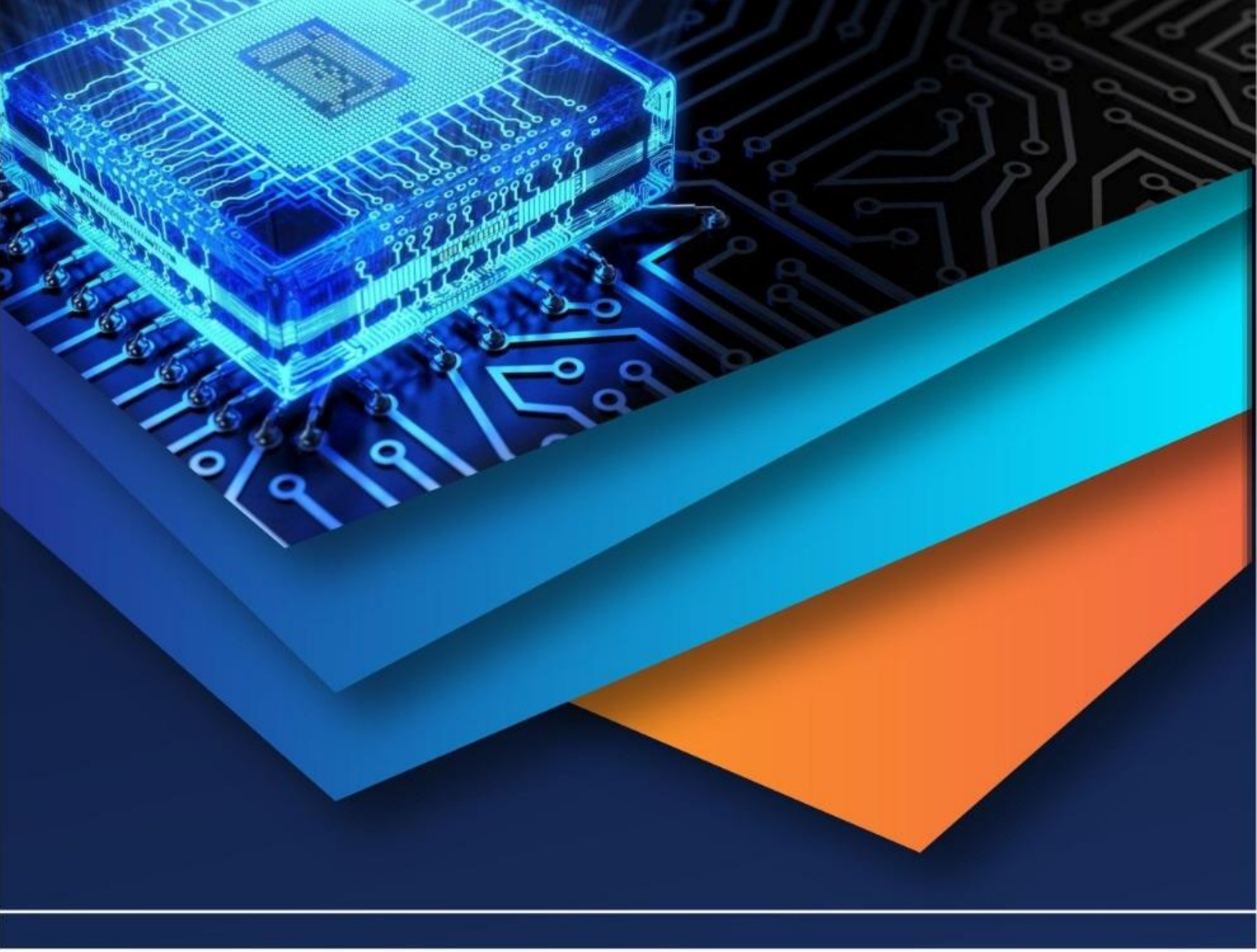

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