# Online Voting System For Our College Management Using Blockchain

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***Abstract-*** *Traditional voting in colleges often faces issues like delays, errors, and lack of transparency. To solve these problems, this project introduces a blockchain-based online voting system designed for United Institute of Technology. The system aims to make elections more secure, trustworthy, and efficient.We began by analyzing the drawbacks of existing methods, including poor security and difficulty in verifying results. After researching multiple blockchain platforms, Ethereum was chosen for its smart contract capabilities and strong community support. The platform allows each vote to be securely recorded on a tamper-proof digital ledger.Our system ensures only eligible users can vote, and results are instantly available without any manual counting. Through surveys and technical comparisons, we focused on user privacy, system scalability, and transparency. The final product not only meets the needs of our institution but also has potential to be used in other organizations, offering a reliable step toward digital governance.*

***Keywords***- Blockchain, Digital Governance, Online Voting System, Smart Contracts, Transparency

## I. INTRODUCTION

Elections are an important part of college life, allowing students and staff to choose their representatives and make collective decisions. However, traditional voting methods can be time-consuming, prone to errors, and sometimes lack transparency. To overcome these challenges, our project introduces a blockchain-based online voting system for United Institute of Technology. This system is designed to make the entire voting process faster, more secure, and trustworthy.

By using blockchain, we ensure that each vote is safely recorded and cannot be altered or deleted. The platform also supports real-time result viewing and helps eliminate common issues like duplicate voting or vote tampering. With an easy-to-use interface and secure backend powered by smart contracts, this system brings modern technology into a space that really needs it—our campus elections.

## II. IDENTIFY, RESEARCH AND COLLECT IDEA

To begin our project, we first identified the common problems faced during college elections—such as manual errors, delayed results, and a lack of transparency. We then explored how technology, especially blockchain, could help solve these issues.

We conducted research by reviewing articles, white papers, and existing projects on online voting and blockchain systems. Through this, we gained insights into how smart contracts work, how votes can be stored securely on a digital ledger, and what features make a voting system trustworthy and user-friendly.

We also looked into real-world use cases, such as blockchain voting pilots in government and private sectors. By analyzing these examples and comparing different blockchain platforms, we gathered ideas that shaped our final solution. This step helped us clearly define our goals and understand how to build a system that is not only secure but also practical for a college environment.

## III. WRITE DOWN YOUR STUDIES AND FINDINGS

During our research phase, we studied various online voting systems and analyzed their strengths and weaknesses. We found that most traditional systems, even digital ones, lacked strong security measures, transparency, and resistance to manipulation. These weaknesses could easily lead to tampering, duplicate voting, or user mistrust.

We explored blockchain technology, focusing on Ethereum, to understand how it could solve these problems. We discovered that smart contracts could automate the voting process, ensuring that each vote is recorded accurately and cannot be changed. This added a high level of trust and reliability to the system.

We also reviewed academic papers, open-source projects, and blockchain-based voting case studies. Our findings confirmed that a blockchain-powered voting system

could offer benefits such as real-time result tracking, voter anonymity, and tamper-proof records. These insights formed the foundation for designing and building a secure, transparent, and scalable online voting platform for our college.

## IV. GETPEERREVIEWED

Once we had a working model of our online voting system, we shared it with our peers, classmates, and faculty members to gather feedback. We asked them to test the platform, explore its features, and provide honest opinions on its usability, performance, and overall effectiveness.The feedback we received was incredibly helpful. Some users appreciated the simple and clean interface, while others pointed out areas where instructions could be clearer. A few suggestions were also made to improve the voting flow and add confirmation messages after a vote was cast.We also discussed the project with our mentors and subject experts, who gave us valuable insights on how to enhance system security and efficiency. Based on all the feedback, we made necessary adjustments and fine-tuned both the frontend and backend. This review process helped us improve the quality and reliability of our project significantly.

## V. IMPROVEMENT AS PER REVIEWER COMMENTS

Based on the feedback we received from our peers and faculty, we made several key improvements to enhance the system's performance and user experience. One major suggestion was to make the user interface more intuitive, especially for first-time users. We addressed this by simplifying navigation, adding tooltips, and including clear step-by-step instructions.

Another important comment was to improve the confirmation process after a vote is cast. In response, we added a secure confirmation message and a blockchain transaction ID, so users could verify their vote was successfully recorded.Security suggestions included better handling of login sessions and data privacy. We implemented session timeouts and encrypted user credentials to strengthen the system's security.These updates not only made the system more user-friendly and secure but also helped build greater trust among users. Incorporating reviewer comments played a crucial role in polishing the final version of our project.

## VI. CONCLUSION

This project has successfully demonstrated how blockchain technology can be used to create a secure, transparent, and efficient online voting system for college elections. By addressing common issues like vote tampering, manual errors, and lack of real-time results, our system offers a reliable alternative to traditional voting methods.

Throughout the development process, we learned the importance of combining strong technical solutions with user-friendly design. Using Ethereum smart contracts, we ensured that every vote is securely recorded and can't be altered. Peer feedback and testing helped us refine the system and make it even better.

Overall, this project not only strengthened our technical skills but also gave us insight into how modern technologies can solve real-world problems. Our system is ready for use in academic institutions and has the potential to be scaled for wider adoption in other organizations and communities.

## VII. APPENDIX

### A. Tools and Technologies Used

- **Frontend**: HTML, CSS, JavaScript
- **Backend**: Node.js
- **Blockchain Platform**: Ethereum(using Ganache and Truffle)
- **Smart Contract Language**: Solidity
- **Database**: MySQL (optional for user data)
- **IDE/Editor**: Visual Studio Code
- **Version Control**: Git and GitHub

### B. Code Snippets (Smart)

```
pragma solidity ^0.8.0;

contract Voting {
struct Candidate {
string name;
uintvoteCount;
   }

mapping(address => bool) public hasVoted;
Candidate[] public candidates;

function vote(uintcandidateIndex) public {
require(!hasVoted[msg.sender], "Already voted.");
candidates[candidateIndex].voteCount++;
hasVoted[msg.sender] = true;
   }
}
```

### C. User Feedback Summary

- Interface was easy to navigate
- Security features were appreciated
- Suggestions helped improve confirmation steps and guidance messages

### D. Glossary

- **Blockchain**: A decentralized ledger technology used to store votes securely.
- **Smart Contract**: Code deployed on the blockchain to automate voting logic.
- **Ethereum**: A blockchain platform used for smart contract execution.
- **Ganache**: A personal Ethereumblockchain for testing and development.

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## REFERENCES

[1] Nakamoto, S. (2008). *Bitcoin: A Peer-to-Peer Electronic Cash System*.
[2] Buterin, V. (2014). *A Next-Generation Smart Contract and Decentralized Application Platform* – Ethereum White Paper.
[3] Wood, G. (2014). *Ethereum: A Secure Decentralised Generalised Transaction Ledger* – Ethereum Yellow Paper.
[4] T. Hardjono and N. Smith, "Decentralized Trust: The Case for Blockchain Voting," *IEEE Security & Privacy*, vol. 16, no. 4, pp. 14–20, 2018.
[5] Solidity Documentation – https://docs.soliditylang.org
[6] Ethereum Developer Documentation – https://ethereum.org/developers
[7] Truffle Suite Documentation – https://trufflesuite.com/docs
[8] GanacheBlockchain Simulator – https://trufflesuite.com/ganache
[9] Research Articles on Secure Online Voting Systems – *IEEE Xplore Digital Library*
[10] Wazid, M., Das, A. K., et al. (2019). *A Secured Blockchain-based Voting System for Decentralized Environments*. *Journal of Information Security and Applications*.
[11] Zhang, Y., &Xue, R. (2019). *Security and Privacy on Blockchain*. *ACM Computing Surveys*, 52(3), 1–34.
[12] Ayed, A. B. (2017). *A Conceptual Secure Blockchain-Based Electronic Voting System*. *International Journal of Network Security & Its Applications (IJNSA)*, 9(3), 1–9.
[13] Chaum, D. (2004). *Secret-Ballot Receipts: True Voter-Verifiable Elections*. *IEEE Security & Privacy*, 2(1), 38–47.
[14] McCorry, P., Shahandashti, S. F., &Hao, F. (2017). *A Smart Contract for Boardroom Voting with Maximum Voter Privacy*. *International Conference on Financial Cryptography and Data Security*.
[15] Hardwick, F. S., Akram, R. N., &Markantonakis, K. (2018). *E-Voting with Blockchain: An E-Voting Protocol with Decentralisation and Voter Privacy*. *IEEE Transactions on Trust Managemen*