# Blockchain based e-Voting App

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***Abstract*—The proposed project aims to develop a secure, transparent, and user-friendly blockchain based e-voting application designed to enhance the integrity of the electoral process and foster public trust in democratic systems. By leveraging the decentralized nature of blockchain technology, this application ensures that all votes are securely recorded, immutable, and tamperproof, safeguarding the voting process from manipulation and fraud. The system integrates Firebase for robust user authentication, guaranteeing that only eligible voters can participate, while maintaining the confidentiality and privacy of each vote. The platform provides real-time vote tallying and result displays through a transparent interface, allowing voters to verify outcomes and enhancing the overall transparency of the election process. The application is designed for accessibility, offering an intuitive Android-based interface that ensures inclusivity for all users, regardless of their technical skills. Additionally, a verifiable audit trail will be established, allowing for independent verification of the voting process and results, thus increasing accountability and public confidence in the system. This blockchain-based e-voting application represents a significant step towards modernizing electoral systems, ensuring secure, transparent, and accessible voting experiences for all.**

***Index Terms*—e-voting, firebase real-time database, blockchain, android**

## I. INTRODUCTION

In today's rapidly evolving digital age, the need for secure and transparent voting systems has become paramount to ensure the integrity of democratic processes. Traditional voting methods, while effe-ctive in many cases, are often subject to challenges such as fraud, manipulation, lack of transparency, and accessibility issues. To address these challenges, the integration of blockchain technology into e-voting systems presents a groundbreaking solution that can revolutionize the electoral process.

Blockchain's decentralized, tamper-resistant nature ensures that votes are securely recorded, preventing any form of manipulation or unauthorized alterationns.By adopting blockchain for e-voting, this project aims to create a system where each vote is verifiable, immutable, and traceable, thereby enhancing public trust in elections. In addition, the system incorporates real-time results display, providing voters with transparent access to vote counts and outcomes as they unfold.

## II. PROCEDURE FOR PAPER SUBMISSION

### *A. Review Stage*

Submit your manuscript electronically for review. prepare it in two-column format, including figures and tables (untill it doesn't fit properly and data is not visible). *B. Final Stage*

After your paper has been accepted. The authors of the accepted manuscripts will be given a copyright form and the form should accompany your final submission.

### *C. Figures*

As said, to insert images in Word, position the cursor at the insertion point and either use Insert | Picture | From File or copy the image to the Windows clipboard and then Edit | Paste Special | Picture (with ―Float over text‖ unchecked).

## III. MATH

Vote Hashing and Encryption (SHA-256): Let each vote ViViVi be represented as data DiDiDi and hashed to form Hi=SHA256(Di)Hi = SHA−256(Di) Hi=SHA256(Di). This hashing function is a one-way function:

Hi=SHA-256(Di) Hi = SHA-256 (Di)Hi=SHA256(Di) which satisfies Hi0,1 256Hi ∈ {0,1} 256Hi0,1256. The SHA-256 function runs in polynomial time, so HiHiHi is computed in O(p(n)) O(p(n)) O(p(n)), where p(n)p(n)p(n) is a polynomial in terms of data size nnn.

## IV. UNITS

Use SI (MKS) units as the primary measurement system. English units may be used as secondary units (in parentheses) if necessary. Time is measured in seconds (s) or milliseconds (ms), particularly for system response times and block confirmation durations. Data storage and transmission sizes are expressed in kilobytes (KB), megabytes (MB), or gigabytes (GB), following binary convention where applicable. Network performance is represented in megabits per second (Mbps). Blockchain throughput is measured in transactions per second (TPS).

Cryptographic strength is expressed in bits (e.g., 256bit for SHA-256 hashes). App versioning follows semantic versioning standards (e.g., v1.0.0). User counts and vote totals are represented as unitless integers. Avoid mixing SI and CGS units in any formulas or performance metrics to maintain dimensional consistency. All units used in equations or data models are clearly defined, and compound units are represented using the center dot (•), such as s•KB. The system follows standard digital computing and networking conventions for all measurements and evaluations.

## V. RESULT


Figure 1: Login Page


Figure 2: Party List

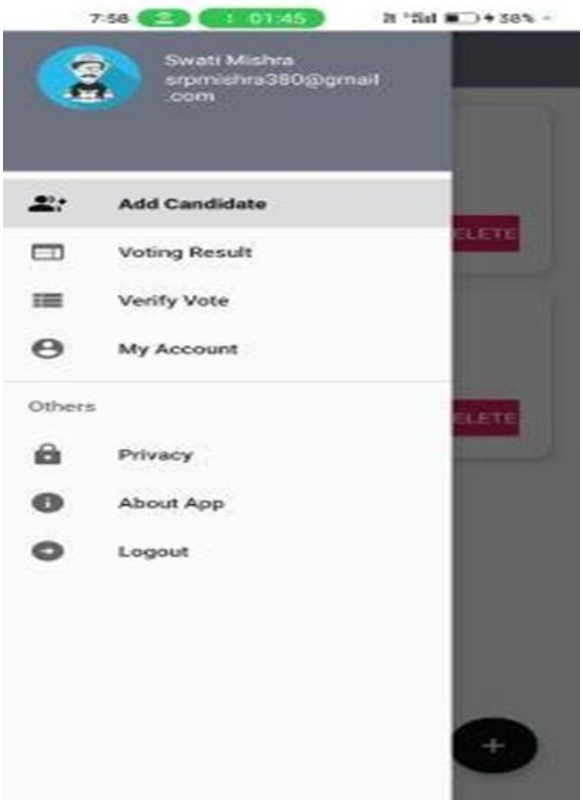


Figure 3: Dashboard

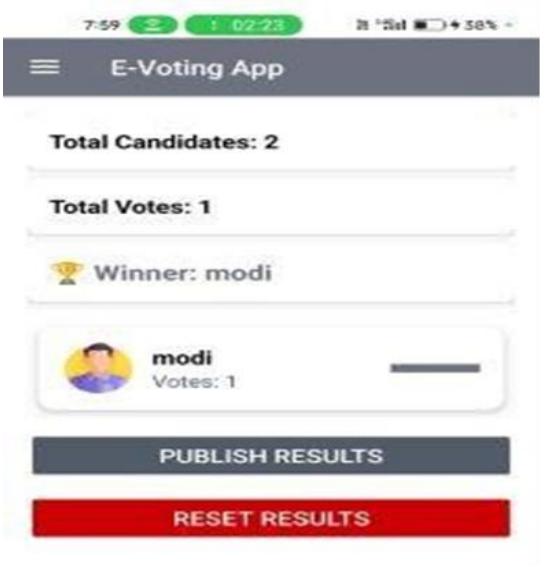


Figure 4: Result


Figure 6: Party List

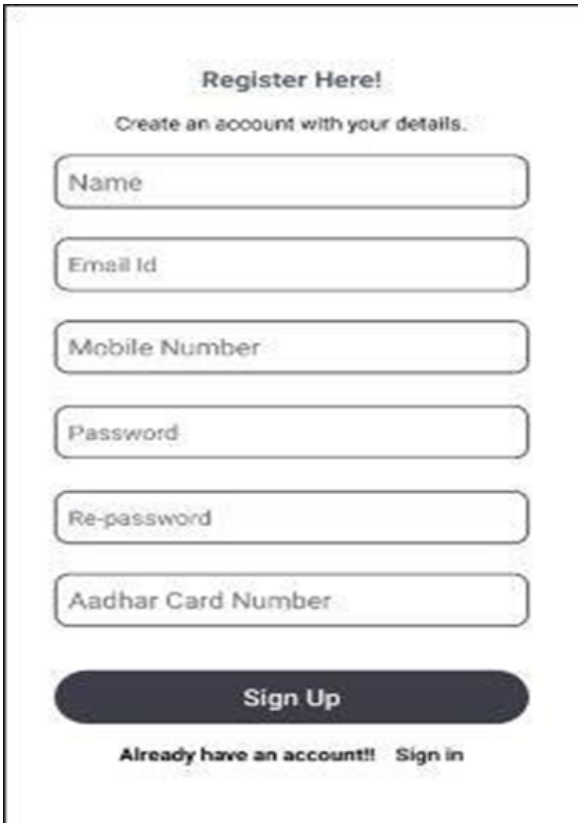


Figure 5: Registration

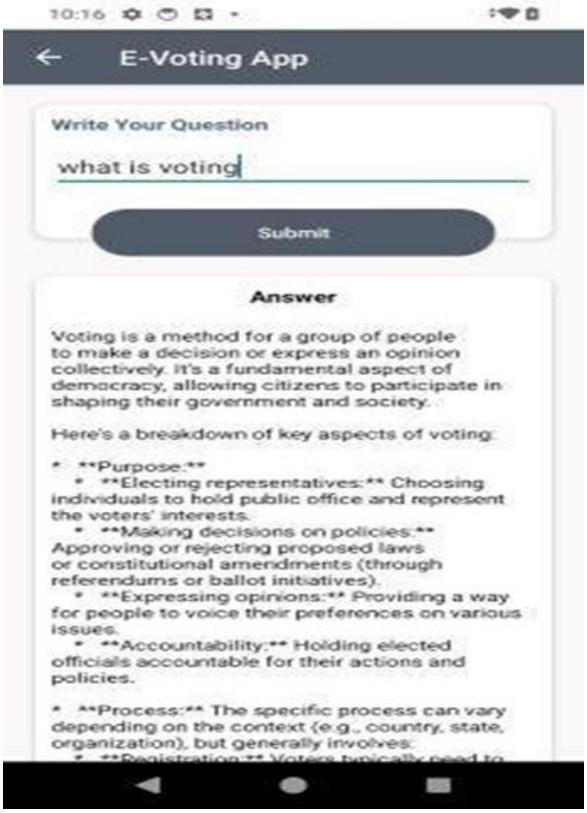


Figure 7: Q & A


Figure 8: Guidelines


Figure 9: Profile

## VI. HELPFUL HINTS

### *A. Figures and Tables*

Place all figures and tables at the top or bottom of columns, not in the middle. Use clear, descriptive captions for figures (placed below) and titles for tables (placed above). If a figure includes multiple sub-parts, label them clearly as (a), (b), etc., within the image. Do not use borders around figures. Use "Fig." for figures (even at the beginning of a sentence) and write "Table" in full. Ensure every figure and table is cited in the text and appropriately numbered using Roman numerals for tables.Use color only if it is essential for interpretation, and indicate if color printing is required. Axis labels in figures must include both quantity and units in parentheses. For instance, use "Vote Count (number)" or "Response Time (ms)" instead of just "number" or "ms". Avoid expressing axes as unit-only labels or as ratios like "Votes/sec". Make sure all figure labels are legible in print (approximately 8 to 12-point font size).

### *B. References*

Number citations sequentially in square brackets [1]. Use the reference number only in the body of the sentence: for example, "as shown in [2]." Do not use "Ref. [2]" unless at the beginning of a sentence. Use superscript for footnotes and place the actual footnote at the bottom of the column where it is cited. Use letters for footnotes in tables. Follow standard citation styles, listing all authors unless there are six or more, in which case "et al." is acceptable. Cite unpublished work as "unpublished" and submitted work as "Submitted for publication."

### *C. Abbreviations and Acronyms*

Define all abbreviations and acronyms the first time they are used in the text, even if already defined in the abstract. For example, write "Blockchain (BC)" on first use. Common technical terms like SI, URL, and TCP/IP do not need definitions. Do not use abbreviations in the title unless necessary. Use no spaces in abbreviations with periods (e.g., "U.S.A.", not "U. S. A.").

### *D. Equations*

Number equations sequentially using parentheses aligned to the right margin, like (1). Use the equation editor for formatting and the correct "Equation" style. Use appropriate math notation such as solidus (/), exponents, or the exp() function to make expressions

compact and readable. Avoid ambiguity in complex fractions by using parentheses. Example:
V=R⋅I1+e−x(1)V = \frac{R \cdot I}{1 + e^{-x}} \tag{1}V=1+e−xR⋅I(1)
Define all symbols before or immediately after the equation. Italicize variables and quantities (e.g., *t* for time). Refer to equations in text using only their numbers, as in "(1)", not "Eq. (1)" unless at the start of a sentence.

## VII. PUBLICATION PRINCIPLES

The contents of the journal are peer-reviewed and archival. *International Journal of Innovative Research in Technology* publishes scholarly articles of archival value as well as tutorial expositions and critical reviews of classical subjects and topics of current interest.

Authors should consider the following points:

1. Technical papers submitted for publication must advance the state of knowledge and must cite relevant prior work.
2. The length of a submitted paper should be commensurate with the importance, or appropriate to the complexity, of the work. For example, an obvious extension of previously published work might not be appropriate for publication or might be adequately treated in just a few pages.
3. Authors must convince both peer reviewers and the editors of the scientific and technical merit of a paper; the standards of proof are higher when extraordinary or unexpected results are reported.
4. Because replication is required for scientific progress, papers submitted for publication must provide sufficient information to allow readers to perform similar experiments or calculations and use the reported results. Although not everything need be disclosed, a paper must contain new, usable, and fully described information. For example, a specimen's chemical composition need not be reported if the main purpose of a paper is to introduce a new measurement technique. Authors should expect to be challenged by reviewers if the results are not supported by adequate data and critical details.

## VIII. CONCLUSION

The blockchain-based e-voting application developed in this project demonstrates the potential of digital technologies to revolutionize the electoral process. By combining the transparency and security of blockchain with Firebase's robust real-time data management, the app addresses critical issues inherent in traditional voting systems, such as tampering, fraud, and inefficiency.

## APPENDIX

The blockchain system in the e-voting application ensures that each vote is recorded immutably. Each transaction, representing a vote, is added to the blockchain ledger. The blockchain’s decentralized nature prevents any tampering or manipulation of votes. The application utilizes a proof-of-work mechanism to ensure the integrity of the voting data and that each vote is securely validated before being added to the blockchain.

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