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Assessing the impact of adopting Blockchain technology in Electronic voting system: Empirical evidence from Bangladesh

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Abstract

Electronic voting has emerged as a competitive alternative to traditional paper-based methods to address inconsistencies and enhance security in voting systems. Recent dissatisfaction with the security and openness of conventional voting systems has prompted a search for more secure and tamper-resistant alternatives. This study investigates the potential transformation of the Bangladeshi voting system through blockchain technology—a digital ledger that can instill trust and inclusivity in elections. During the last quarter of 2023, 108 participants completed an online survey. The study employs SPSS-based regression analysis as the research method. The findings reveal that all dimensions of the blockchain model significantly and positively impact preventing voters from tracing their identity. To acknowledge limitations, the study focused on blockchain technology users in Khulna and Jessore City, recognizing potential variations based on the Electronic Voting Machine (EVM) facility. This research aims to aid the government in understanding key factors influencing the adoption of blockchain technology to secure identity in the e-voting system.

Keywords: *Blockchain, Electronic Voting, Real-time Voting, Decentralisation, Crypto.*

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Introduction

Background of the Study

Blockchain emerged in 2008 with Bitcoin, introducing a decentralised and transparent ledger. Initially designed for cryptocurrency transactions, blockchain evolved beyond Bitcoin (Tripathi

et al., 2023). In 2015, Ethereum expanded its use by introducing smart contracts, enabling decentralised applications (DApps). This shift broadened blockchain's applicability to diverse industries, such as finance, supply chain, and healthcare, as its decentralised structure promised heightened security and transparency (Khan et al., 2021). A blockchain is a chain of blocks, where each block has its data and a unique 'header.' The header contains technical details, a reference to the previous block, and a hash of the data. This hash ensures the order and integrity of the entire chain, making the blockchain a secure and transparent data structure (Houston & Campbell, 2023). Governments and enterprises, recognizing blockchain's potential, initiated extensive pilot projects and collaborations. The Electronic Voting Machine (EVM) system employed during the 2018 general election in Bangladesh faced low acceptance rates, reflecting suboptimal responses (Wikipedia, 2024). Integrating blockchain into Electronic Voting Machines offers an opportunity for improvement, promising enhanced accuracy, privacy, security, and transparency. This, in turn, can potentially elevate the acceptance rate of Electronic Voting in Bangladesh. The technology's journey involves addressing challenges like scalability and regulatory considerations. Despite hurdles, blockchain's ongoing evolution positions it as a transformative force, with increasing integration across sectors. From its origins in cryptocurrency, blockchain has become a versatile technology, reshaping various facets of our digital landscape (Mohammed Abdul, 2024).

Objectives of the Study

General Objective

The study aims to refine Bangladesh's election by adopting Blockchain technology in the electronic voting system, ensuring a transparent, secure, real-time, and privacy-focused election.

Specific Objectives

The key specific research objectives are delineated as follows:

- To Vulnerability Assessment and Cybersecurity Enhancement of the electronic voting system of Bangladesh,
- To implement Tamper-Resistant Blockchain voting records,
- To use the Decentralised Storage Model for enhanced voter data security,
- To build a transparent voting system for the election,
- To balance voter anonymity and overall transparency, and
- Making Public Awareness and Education Campaigns on Blockchain voting.

This study explores blockchain technology's use to enhance the security and transparency of voting in Bangladesh. This involves identifying and addressing weaknesses in the current system, suggesting robust security measures, and creating a secure path for votes (Bhuiyan & Akter, 2024). Additionally, blockchain is considered for decentralised storage to protect voter information. Smart contracts are being explored to simplify the voting process. Privacy-preserving techniques like zero-knowledge proofs (ZKPs) that is a common way privacy is gained on public blockchain networks is through zero-knowledge proofs (ZKPs)—a way for one party to cryptographically justify to another that they possess knowledge about a piece of information without unveiling the actual underlying information are being examined (Yang & Li, 2020). Alongside these efforts, plans are underway to raise public awareness and launch campaigns, ensuring everyone has the correct information and trusts the new voting system. The overall goal is to revitalise the voting process in Bangladesh, making it more secure, transparent, and trustworthy.

Scope of the Study

This article meticulously formulates a protocol to implement a decentralised electronic voting system utilising cutting-edge blockchain technology. The proposed system aims to establish a public and transparent voting process, prioritising the preservation of voter anonymity, secure data transmission, and verifiability.

In Bangladesh's democratic landscape, where the significance of the vote cannot be overstated, ensuring the security and protection of this fundamental aspect is imperative, considering its potential to shape the nation's future. Blockchain technology emerges as a pivotal player in fulfilling this need, presenting an opportunity to fortify the integrity of the voting process (Hajian et al., 2023). The expansive scope for adopting blockchain technology in the context of Bangladesh's electoral system is evident. The key areas identified for exploration include:

City and Town Elections

Investigating how blockchain can enhance transparency and security in voting within cities and towns, where many people vote in a concentrated area.

Youth and Student Elections

Testing blockchain for student elections in schools and colleges to gather feedback from tech-savvy students on its usability and effectiveness.

Remote Voting for Expatriates

Designing and testing a blockchain-based system to enable secure voting for Bangladeshi citizens living abroad, facilitating their participation in national elections.

Piloting Blockchain Innovation in By-Elections

Conducting targeted pilot programs infused with blockchain technology during specific by-elections, strategically adopting a phased approach. This methodical implementation not only allows for real-world testing in controlled settings but also facilitates a structured learning process, ensuring continuous refinement and improvement based on practical experience and feedback (Gulia et al., 2024).

Rural and Local Community Elections

Exploring the potential of blockchain in rural areas and local communities to extend the benefits of secure and transparent voting to a broader population, and recognizing that training may be required to ensure effective implementation in these settings. For rural areas, it is important to note that training may be necessary to facilitate the adoption of blockchain technology. This additional consideration addresses the specific needs and challenges of introducing advanced technology in rural communities (Merrell, 2022).

Literature review

Election in Bangladesh

Elections in a democracy are vital processes where citizens vote to choose representatives, ensuring governance reflects the collective will and promoting transparency and inclusivity. In Bangladesh, this democratic practice has been upheld through eleven parliamentary elections and three popularly elected presidential elections since 1971, marking the nation's commitment to democratic principles (Wikipedia, 2024).

Voting in Bangladesh

A democratic election allows the electorate to select one candidate from among several contenders, and the results of that vote determine the government. Elections between two or more rival parties are almost certain to occur (Eulau, Gibbins, & Webb, 2020). The right to vote in Bangladesh elections is granted through adult franchise, where individuals meeting specific criteria can enroll on the electoral roll for a designated parliamentary constituency. Eligibility requires being a Bangladeshi citizen, at least eighteen years old, mentally sound as determined by a competent court, a resident of the constituency by law, and without conviction for specified offenses under the law (BDLaws, 2019).

Electronic Voting System

In Bangladesh, electronic voting machines (EVMs) were developed to address issues with paper ballots. The responsibility for constructing EVMs was taken on by SM Lutfar Kabir, the chairman of BUET's ICT section, who presented the plan to the Caretaker administration in 2007. The initiative involved Pilab Bangladesh, an EVM maker. EVMs were successfully applied in 2007 during the Dhaka Officers' Club working committee election. Since then, the nation's municipal

corporation elections have occasionally used electronic voting machines (EVMs). They were used for the first time in a general election in six constituencies in 2018 (Wikipedia, 2023). However, the acceptability of electronic voting machines (EVMs) in elections was an issue. As a result, Bangladesh's general election of 2024 was conducted using traditional paper ballots (Mint, 2023).

History of Blockchain

Blockchain is an information recording technique that makes it difficult or impossible for the system to be altered, compromised, or tricked. A distributed ledger known as a blockchain replicates and disperses transactions among the computers of the blockchain network. Blockchain technology is a framework for storing public transactional records, or blocks, across multiple databases, or the "chain," within a peer-to-peer network. This type of storage is commonly called a "digital ledger." Each transaction in this ledger is validated and protected against manipulation by the owner's digital signature. Because of this, the data in the digital ledger is highly safe (Ravikaran, 2023). To put it another way, the digital ledger is essentially a network of multiple computers sharing a Google spreadsheet where transactional data is kept according to actual purchases. The intriguing aspect is that while everyone may view the data, it cannot be altered. Think of Blockchain as a chain of digital blocks, where each block holds different information, not just about money transactions. These blocks are connected using a special code generated by a mathematical formula, pointing to the block before it. Each block has three main parts (Hayes, 2023)

- Details about the transaction, like when it happened and how much it would involve.
- Information about the people involved in the transaction, including who they are and their digital signatures.
- For public blockchains, extra details that make a block special are represented by a unique code called a hash.

Growth and Development of Blockchain

Distributed ledger technology, or DLT, another name for blockchain technology, has drawn considerable interest from the government, business community, and academic community in recent years. Many see it as a cornerstone technology that could transform several application sectors completely. It was first presented in 2009 as the core technology of Bitcoin, the first digital money to be widely used worldwide. Since then, it has been used in many different contexts (Wikipedia, 2024).

Moving past the Bitcoin blockchain, a new kind of blockchain has surfaced that allows computer programmes, or "smart contracts," to be deployed and executed on top of the corresponding network. These smart contracts open the door to developing a new class of apps known as decentralised applications (DApps), which enable the autonomous execution of programmes independent of a centralised authority. (National Blockchain Strategy: Bangladesh, 2020) As it has the features to protect the voter's privacy, protect their vote from alteration, and make a transparent election, it is possible to adapt the Blockchain technology into an electronic voting system.

Current Scenario of Blockchain

Cryptocurrencies and Digital Payments

The most popular application of blockchain technology now is in currency. Blockchain is used by Ethereum, Bitcoin, and other popular cryptocurrencies to process and record transactions securely. With the help of this technology, it is possible to guarantee transparency and safeguard the identity and financial data of cryptocurrency buyers and sellers (Coursera, 2023).

Supply Chain Management

Blockchain simplifies supply chain workflows for diverse stakeholders, providing a unified IT infrastructure. This enhances transparency for auditors, offering increased visibility into actions across the entire value chain (Consensys, 2023).

Smart Contracts

Smart contracts are autonomously executed programs on the distributed ledger, ensuring consistency across all network nodes. Verification by every node guarantees uniformity in data interpretation (KUMAR, 2018).

Voting Systems

Voting on blockchain has a bright future because of its special features, prioritizing security and anonymity. Nearly 30,000 ballots from the 2020 Russian parliamentary election were tracked using a blockchain system. It seems to be the largest voting scenario with blockchain technology yet documented (Team, 2021).

Challenges and Constraints

There are several obstacles to overcome when starting a literature review on blockchain in voting systems: a dearth of specialised studies, changing technological complexity, various settings, and critical source evaluations. Further complicating the process of gaining thorough insights are potential gaps and inconsistencies in reporting standards, which present challenges for data collection. The challenges are:

- Limited Research Availability
- Diversity of Contexts
- Evolution of Technology
- Quality and Relevance of Sources
- Financial problem

Theoretical framework

Conceptual Framework

Particularly in the context of general elections, debates have emerged about the lack of transparency and trust in the voting process. Key concerns include a lack of transparency, the possibility of hacked party emails, issues with vote verification, and issues with accessibility and overall security of the voting process. For this reason, some nations have already shifted their voting system to blockchain technology (Ilechukwu et al., 2024). One of them is Russia. In June 2019, authorities in Moscow announced a hearing for blockchain-based electronic voting. The initiative, which was implemented in cooperation with the Moscow City Election Commission and the Moscow Department of Information Technologies (DIT), received significant support during the trial period. The blockchain-based system does not replace traditional voting but represents another type of voting used by Muscovites. The Russian Duma stored the results of electronic voting with the help of distributed ledger technology (DLT). This will help ensure transparency in elections and eliminate intermediaries in the electoral process (Wafula, 2019). Blockchain voting is no different from a traditional system. The blockchain-based electronic voting system framework forms the basis for successfully integrating blockchain technology into the electronic voting system. This approach includes the basic concepts, principles, and interactions necessary to create a secure, transparent, and effective electronic voting system. (Dai, Wu, & Wang, 2021)

Blockchain Infrastructure

The main point is to choose and install a suitable blockchain platform such as Ethereum or Hyperledger. Blockchain acts as an immutable database that records and verifies every vote in the election (Zheng et al., 2017).

Smart Contracts

Smart contracts play an important role in automating and managing voting rights. These contracts are sent via blockchain and manage the entire voting process, making it transparent, accurate, and secure (Neloy et al., 2023).

Voter Registration and Identity Verification

Strong voter registration and authentication provide every eligible voter with a digital identity stored on the blockchain. This security verification process ensures the complete integrity of electronic voting (Panja & Roy, 2021).

Decentralised Consensus Mechanism

Approval mechanisms such as Proof of Work or Proof of Stake support distribution. This process increases security with a decentralised approach by identifying and confirming the legality of transactions.

Accessibility and User Interface

It is important to ensure the participation of all voters. To encourage public participation, user interfaces should be intuitive, easy to use, and applicable to multiple devices.

Encryption and Privacy Measures

Strong encryption protects your game's privacy and confidentiality. The end-to-end encryption protocol ensures privacy by preventing voting data from being transmitted and stored while maintaining transparency.

Public Testing and Auditability

Electronic voting machines are subject to public scrutiny and inspection before they are made available for use. This partnership involves stakeholders and the public in identifying potential vulnerabilities and building trust and confidence.

Theoretical Framework

Today's governance environment challenges traditional elections, including transparency, stability, and flexibility. While identifying flaws in the established framework, the researcher realised an opportunity for revolutionary change, including incorporating blockchain into elections (Jafar et al., 2021). This theoretical framework proposes a path that reduces current constraints and ushers in a new era of leadership. This new model promises to strengthen the electoral process, solve negative problems, and build trust, unity, and progress by combining transparency, security, immutability, private voting, and existing functionality.

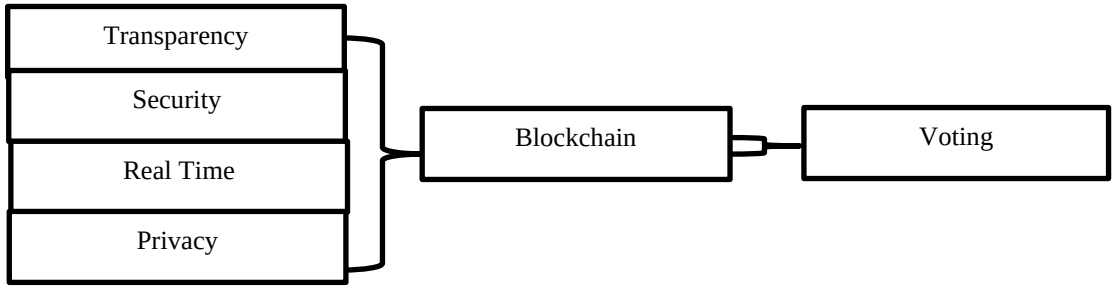

Figure 1: Blockchain-based core activities for E-voting Model (Author's proposed model)

The proposed model has four properties: transparency, immutability, privacy, and immediate functionality (Figure 1). This sharing forms the basis of the researchers' view of security and fair voting. These items are not only functional, but also carefully selected key points to strengthen the basis of the election and ensure a safer, transparent, and effective transition in the election process (Hajian Berenjestanaki et al., 2023).

Transparent

Transparency is the most important feature of the electoral process and requires the results to be seen and accepted by the country's people. Using the distinction between public and private in blockchain, results can be made public, allowing for public visibility and storage. This transparency not only preserves the elements of trust but is also important in developing confidence in elections (Košťál et al., 2019).

H1: *Transparency positively creates an impact on voting.*

Security

The researchers have previously emphasised that blockchain functions as a distributed ledger spread across millions of nodes globally, ensuring that once records are registered, they remain unalterable. This unique feature drives the researcher's advocacy for transitioning the voting infrastructure to blockchain. With this implementation, once voters register their vote, the risk of

any subsequent alterations vanishes, guaranteeing the integrity and permanence of the voting records (Ganne, 2018).
H2: *Secured vote data positively creates an impact on voting.*

Voter Privacy
Blockchain protects voters' privacy through encryption technology. Once the vote is cast, it is encrypted and added to the blockchain to ensure anonymity. The voter's identity can be protected using cryptographic hashes and security algorithms. Additionally, the decentralised nature of the blockchain means there is no central authority to store personal data, thus reducing the risk of data leakage. Smart contracts and zero-knowledge certificates increase privacy by allowing authentication without revealing vote details. This decentralised encryption method increases the confidentiality of voting data and trust in the voting process (Yang & Li, 2020).
H3: *The privacy of voters positively impacts voting.*

Real-Time Voting
Instant counting in a blockchain-based system means that votes are recorded and counted immediately after voting. This fast and accurate calculation occurs due to the way it is installed. It makes the entire process faster and more reliable by allowing everyone to see results instantly (Shaikh et al., 2025). This transparency reduces errors and gives people confidence that the election is fair and accurate. The system is effective and provides timely, accurate results for reliable insurance.
H4: *Real-time vote count and result positively create an impact on voting.*

In Figure 2, the differences between traditional voting systems and blockchain-based systems are perceptible. In the traditional voting systems, if someone attempts to modify or reuse the voting record, they can do so quickly, and it becomes challenging to clarify the record's authenticity. On the other hand, a blockchain system does not have a central authority; instead, data is stored across multiple nodes (Vladucu et al., 2023). This decentralized structure makes it nearly impossible to manipulate all nodes and alter the recorded data. As a result, votes cannot usually be destroyed, and their validity can be verified by comparing them with the records from other nodes (Ab Aziz & Shukur, 2021). If implemented, blockchain technology provides a digital, decentralized, encrypted, and transparent ledger that is resistant to manipulation and fraud (Habib et al., 2022). A Bitcoin-based electronic voting system significantly minimizes the risks associated with electronic voting, creating a tamper-proof voting system. However, for a blockchain-based electronic voting system to function correctly, the voting infrastructure must be entirely decentralized, meaning that no single entity, including the government, should have control over the online voting system (Angsuchotmetee et al., 2019).

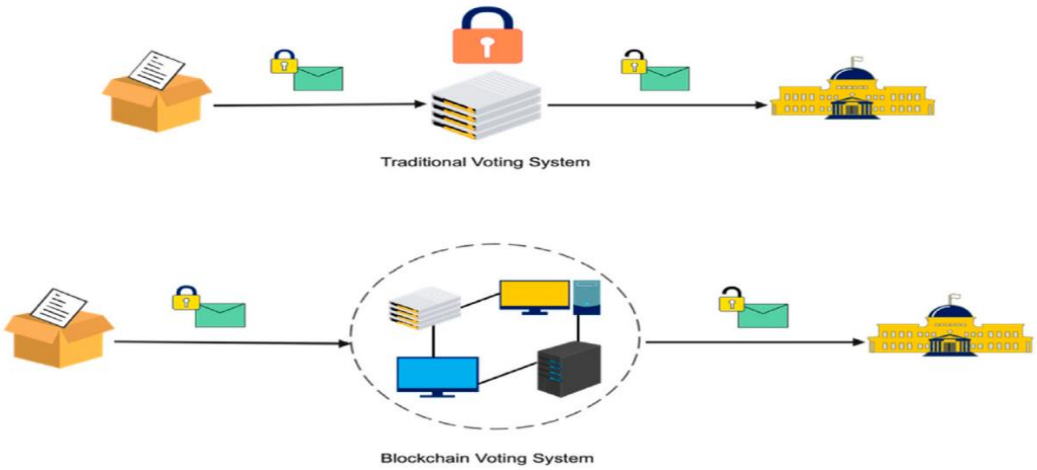

Fig. 2 Traditional vs. blockchain voting system (Jafar, Aziz, & Shukur, 2021).

Analysis & discussion

Research Design

This study uses a quantitative research approach and surveys to gather information from 108 individuals in Bangladesh. The goal is to determine how interested voters are in implementing blockchain technology into the electronic voting process. Responses are gathered using a structured questionnaire based on the study's factors. This enables statistical analysis to assess the influence of privacy, real-time functioning, security, and transparency on voter choices.

Summary of Variables

Table I: Dependent Variable

Sl.	Variable Name	Acronym
1.	Voting	VOT

Table II: Independent Variables

Sl.	Variable Name	Acronym
1.	Transparency	TRN
2.	Security	SRT
3.	Real-Time	RTM
4.	Privacy	PVC

Model Equation of the Study

The study's model measures the relationship between the dependent variable (Voting) and the four blockchain-based independent variables. The following equation estimates the general model.

$$VOT_t = \delta_0 + \delta_1 (TPN_t) + \delta_2 (SRT_t) + \delta_3 (RTM_t) + \delta_4 (PVC_t) + E_t$$

In the above equation, VOT measures people's intentions on blockchain-based electronic voting in Bangladesh, δ0 is the model's intercept or constant, δk (k = 1, 2, 3, and 4) are the coefficients to be estimated, and E is the equation's error term. All variables are measured at an individual time t. A significantly optimistic coefficient estimate shows a statistically significant positive relationship between people's intentions on a blockchain-based electronic voting system and the corresponding factors. On the other hand, a significantly negative coefficient estimate indicates a statistically significant negative relationship between the blockchain-based electronic voting system and the corresponding factors.

Data Collection and Sample Selection

The data used in this study is primarily collected, and random sampling is done using an online survey using Google Forms. The population is Bangladesh's voters. To analyze the impact on southern people's motives and those who have already voted using the e-voting system, the targeted locations of collected data are Jessore and Khulna. One hundred eight respondents participated between September 2, 2023, and January 20, 2024.

Table III: Descriptive Statistics of Demographic Characteristics

Demographics	Particulars	N = 108	Percentage
Gender	Male	78	72.2
	Female	30	27.8
	Other	0	0
Age	18-25	53	49.1
	26-35	28	25.9
	36-50	20	18.5
	Above 50	7	6.5
Occupation	Student	58	53.7
	Gvt. Job Holder	10	9.3
	Pvt. Job Holder	11	10.2

	Business	10	9.3
	Housewife	7	6.5
	Entrepreneur	12	11.1

The Table III contains the descriptive statistics of the demographic characteristics of the respondents. The sample comprises 72.2% male, 27.8% female, and 0% other. Most of our respondents are between 18 and 25, 49.1%, 25.9% are between 26 and 35 years old, 18.5% are 36 to 50, and 6.5% are above 50 years old. Most respondents are students, holding 53.7% of total respondents, 9.3% are doing business, 10.2% are Private Job Holders, 9.3% are holding Government Jobs, 11.1% of respondents are entrepreneurs, and only 6.5% are homemakers.

Measures and Scales

Table IV: Reliability Statistics

Cronbach's Alpha	Number of Items
.754	4

Table V: Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
.798[a]	.678	.664	.338	2.154

Table VI: ANOVA

Model	Sum of Squares	Degrees of freedom	Mean square	F Statistic	Significance
Regression	17.646	4	4.411	38.632	<.001[b]
Residual	11.762	103	.114		
Total	29.407	107			

Predictors: (Constant), TRN, SRT, RTM, PVC; Dependent variable: VOT)

Table VII: *Coefficients*

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	-0.451	.112		-7.657	.000
TRN	.362	.024	.328	9.258	.000
SRD	.492	.039	.475	6.364	.001
RTM	.434	.016	.429	5.964	.003
PVC	.261	.027	.243	8.354	.000

Dependent Variable: VOT

The table above (Table VII) shows that Transparency, Security, Real-Time, and Privacy have statistically significant positive impacts on adapting blockchain technology in the electronic voting system. Transparency influences blockchain technology adaptation in the intention of electronic voting systems, followed by Security, Real-Time, and Privacy. The intercept (δ0) is -0.451, which is also statistically significant. The model has an R-squared value of .600, indicating that the explanatory variables can explain 60 percent of the variance in voters' intention. In addition, Cronbach's alpha is 0.754, indicating a high reliability level. All constructions with dependability values higher than a Cronbach's alpha of 0.700 showed no issues, which is over the threshold. Table IV shows that the Cronbach alpha values are higher than the 0.700 cutoff point, indicating high-quality and trustworthy data. Composite reliability is shown between processes (George, D., 2011). In other words, the value specifies that response values for each participant across the set of questions are consistent. Moreover, the Durbin-Watson value is 1.50 - 2.50 (2.388), indicating no autocorrelation in the residuals of the statistical regression analysis.

Statistical Tools Analysis

The researchers adjusted tools from earlier studies to match the blockchain's incorporation into electronic voting platforms. The scale items are rated on a five-point Likert scale, where one represents strongly disagree and five represents strongly agree. Analysis of linear regression is the research methodology. Before running the regression, internal consistency is measured using Cronbach's alpha. IBM SPSS Statistics 26 is used for this investigation's equations and related tests. Each hypothesis has been investigated at the significance level of 0.05.

Findings, recommendations, and conclusion

Findings of the Study

Bangladesh's conventional voting system has many problems, including security flaws, privacy difficulties, and slow results. The decentralised technology known as blockchain appears to be a game-changing answer. Hashing protects privacy, immutability secures voting data, and smart contracts provide safe identity verification. Positive intentions towards integrating blockchain technology into the electronic voting system are found in a study involving 108 voters in Bangladesh. Significant effects of Transparency, Security, Real-Time, and Privacy are revealed by statistical analysis. With an R-squared value of .600, transparency has the highest explanatory power. The study's regression analysis's lack of autocorrelation is confirmed by the Durbin-Watson value (2.388), while Cronbach's alpha attests to the consistency of the questionnaire. After analysing respondents' opinions, the following result was their opinion. The term transparency in elections might be achieved by adapting Blockchain in the electronic voting system for a transparent election, and auditors can verify it anytime. Regarding the security of the Blockchain adaptation for protecting voting data and anticipating vote tampering, Blockchain's real-time update feature, which groups questions, indicating the election's result in real-time to save time, has a significant impact. The voter-privacy protection statement shows that it can protect their identity and privacy. Most importantly, people would like to adapt and accept the election with this blockchain-based electronic system. However, because blockchain technology is relatively new in Bangladeshi society, most Bangladeshis know very little about this revolutionary technology. As a result, some have misconceptions about it and its applications.

Recommendations

The researchers studied to anticipate key flaws in the traditional voting system by adapting blockchain technology to Bangladesh's electronic voting system. The research surveyed voters and found that most people respond positively after learning about the features and advantages of blockchain, which can play an important role in voter privacy and the democracy of a nation through a transparent election. However, a few recommendations can be considered after the study.

- Increase awareness of blockchain and give officials training about the technology.
- Campaigns to inform the public about blockchain technology and its uses in voting systems can increase acceptability and public comprehension, making the switch to blockchain-based elections more smoothly.
- Election organisations should collaborate with tech professionals to develop and improve secure blockchain voting systems to ensure resilience against attacks.
- Governments must enact laws and regulations that specify the moral and legal requirements for using blockchain technology in elections.
- Nations should cooperate in exchanging experiences and ideas on blockchain voting to promote the ongoing development and worldwide advancement of electronic voting systems.
- An alternative, secure electronic voting system may use end-to-end verifiable systems that mix paper ballots with cryptographic techniques.

A few more recommendations can come out of the study by the researcher. As the people of Bangladesh still have a narrow idea about blockchain technology, the adoption of blockchain technology in the electronic voting system can face problems. However, if campaigns about this

technology and testing blockchain-based electronic voting in organizational elections, schools can also help everyone learn about it. However, it required money and time as well.

Conclusion

This paper is concluded by critically analysing Bangladesh's conventional voting system and highlighting its main shortcomings regarding voter privacy, electoral transparency, and data security. The report advocates integrating blockchain technology into the electronic voting system as a revolutionary approach. The shortcomings of the present system are addressed by the decentralised, tamper-proof ledger of blockchain, which guarantees security, transparency, and real-time outcomes.

Based on a sample of 108 voters, the empirical findings showed a favourable desire to implement blockchain technology in Bangladesh's electronic voting system. According to the statistical research, voters' intentions to adopt blockchain technology were significantly influenced by transparency, security, real-time functioning, and privacy. The research findings have significance for bolstering democratic processes, cultivating citizen trust, and improving the election system's overall integrity. E-voting remains controversial in all aspects of national issues. While some systems show good security, many lack the necessary privacy and usability features of usual elections. Voters must keep faith in the election authority, making it hard to prove fraud. In contrast, blockchain-based e-voting systems offer stronger solutions to these controversies.
The recommendations include working with technology experts and electoral bodies, establishing clear legal frameworks, educating the public about blockchain technology and its applications in voting systems, and exchanging experiences globally to advance electronic voting systems. As nations move towards modernity, upholding democratic norms becomes more dependent on transparent and secure technology such as blockchain.

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