



Blockchain Technology in Voting

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Why in News

Election Commission (EC) officials are exploring the potential of using **blockchain technology** to enable **remote voting**. The aim is to **overcome the geographical hurdles in voting**.

Remote voting may take place in person somewhere other than an assigned polling station or at another time, or votes may be sent by post or cast by an appointed proxy.

There have been **demands** from various political parties that the EC should ensure that **migrant workers** who miss out on voting, as they cannot afford going home during elections to exercise their franchise, should be allowed to vote for their constituency from the city they are working in.

Key Points

- **Blockchain Technology:**
 - Blockchain is a system in which the **database of recordings (a 'chain')** **appears on multiple computers at the same time** even as it is updated with any new digital information ('a block').
 - It offers a singular combination of **permanent and tamper-evident record keeping**, real-time transaction transparency and auditability.
 - The initial and primary use of blockchain technology was for monitoring **cryptocurrency** (e.g. bitcoin) transactions. However, other usage and applications have emerged in the last few years.

The government of **Andhra Pradesh** and **Telangana** have put the **land records on the blockchain technology** owing to its easy traceability feature.

- **Blockchain Technology in Voting:**
 - **Growing concern over election security, voter registration integrity, poll accessibility, and voter turnout** has led governments to consider blockchain-based voting platforms as a means to increase faith and participation in essential democratic processes.
 - **Electronic voting** has been used in varying forms since the 1970s with fundamental benefits over paper based systems such as increased efficiency and reduced errors. At present, the feasibility of blockchain is being explored for effective e-voting.
 - Even the EC had used a one-way electronic system for service electors (consisting of personnel belonging to the armed forces, central para military forces and central government officers deployed at Indian missions abroad) i.e. **Electronically Transmitted Postal Ballot System (ETPBS)** in 2019 Lok Sabha Elections.
 - Blockchain's decentralized, transparent, immutable, and encrypted qualities **could potentially help minimize election tampering and maximize poll accessibility.**
 - **Possible Working:**
 - A blockchain remote voting process would involve **voter identification and authorisation** using a multi-layered IT enabled system (with the help of biometrics and web cameras) at the venue.
 - After a voter's identity is established by the system, a blockchain enabled **personalised e-ballot paper (Smart Contract)** will be generated.
 - When the vote is cast (Smart Contract executed), the **ballot would be securely encrypted and a block chain hashtag (#) will be generated.** This hashtag notification would be sent to various stakeholders i.e. the candidates and political parties.
- **Limitations:**
 - Any new technology systems, including those based on blockchain technologies, are **vulnerable to cyber-attacks** and other security vulnerabilities.
 - These could cause **vote manipulation, paper trail erasure, or electoral chaos.**
 - Furthermore, a voter verification system that uses biometric software, such as facial recognition, could lead to **false positives or negatives in voter identification**, thus facilitating fraud or disenfranchising citizens.
 - Blockchain-based voting systems may also entail **privacy risks and concerns.**

Way Forward

- India is primed to lead globally on how it **transitions to next generation** voting systems. However, pilot examples from the 2018 US midterm elections underlines that there needs to be a bridge between security concerns and technological innovation. Thus, such a service should be provided by an extremely vetted technology provider and system.
- EC could try blockchain-based voting first as a mock exercise in some locations on a small scale and keep having stress tests to ensure it is durable. Then it can go onto the next level of having mock elections where people can take part using EVMs for their real vote and a mock vote.

Source: IE