

Issues and Effectiveness of Blockchain Technology on Digital Voting

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Abstract- Block chain is a technology that enables moving digital coins or assets from one individual to other individual. Blockchain concept can be understand with the concept of linked list in Data Structure, because its next key address are stored in previous key and they are linked with each other. It was first conceptualised in 2008 which implemented in the successive year as a core component of the digital currency bitcoin, which works as a public ledger of all transactions. It is varying in size and grew up to 50 GB to 100 GB. Bitcoins save time in terms of transaction. In 2016, central securities depository of Russian Federation announced a pilot project on the next block chain 2.0 to explore the use of block chain based automated voting system. Other applications of block chain is: Smart Contract, Cloud Storage, and Paying Employees. Limitations of this technology is that it less secure. It lacks privacy. Paper reviews the solutions of the issues of digital voting by using Blockchain technology.

Keywords: Digital voting, Blockchain technology, security, digital coins,

1. Introduction

Voting is something choosing deserving candidate in majority in democratic country. The most common way in which voting system is through a paper based system, but it has many disadvantages like time consuming, security of people, stealing, etc which makes the advantages of digital voting. Digital voting is the use of electronic device such as voting machines or an internet browser to cast vote. Digital voting may also referred as e-voting, when voting done using machine in a polling station and i-voting, when voting done using a web browser. Digital voting also has some disadvantages like security of data, potential attacks. One way to solve these security credentials problems through the blockchain technology. In simple terms, blockchain is a connection between the various blocks. However, it is also a technology that enables moving digital coins or assets from one individual to other individual. Now we will further described below the issues and effectiveness of blockchain technology on digital voting.

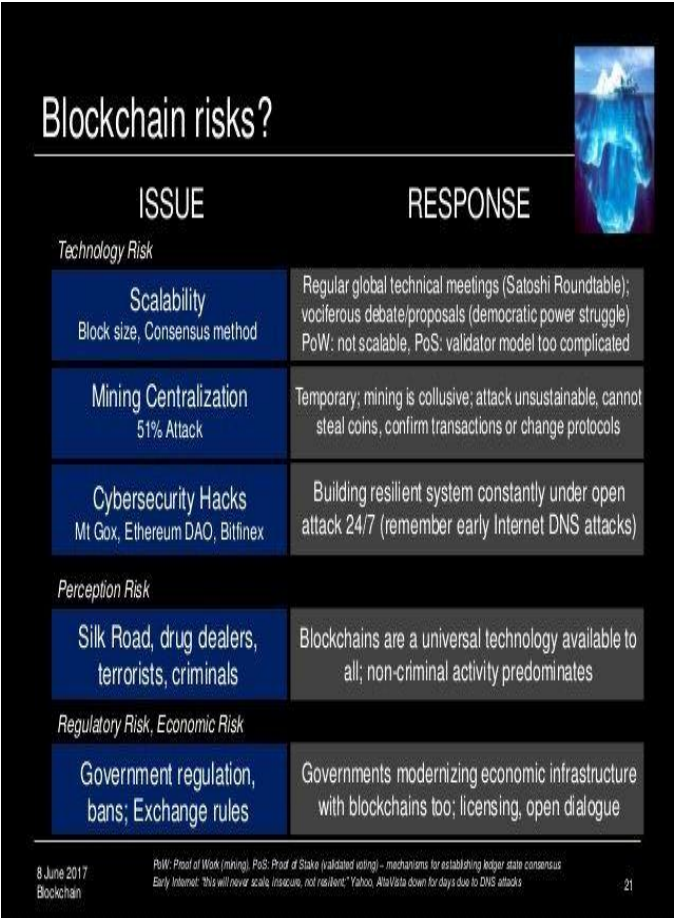
2. Related Work

The first distributed blockchain was conceptualized by [5] "Santoshi Nakamoto" in 2008, which was implemented in the following year as a core component of the digital currency bitcoin, which is serve as the public ledger for all transaction. In 2016, the Central Security Depository of Russian Federation announced a pilot project on the next Blockchain 2.0 in order to explore the use of blockchain based automated voting system. Charles Stewart of the Massachusetts Institute of Technology estimates that 1 million more ballot were counted in the 2004USA presidential election than in 2000 because electronic voting

machines detected votes that paper-based machines would have missed. In May 2004 the U.S. Government Accountability Office released a report titled "Electronic Voting Offers Opportunities and Presents Challenges", analyzing both the benefits and concerns created by electronic voting. A second report was released in September 2005 detailing some of the concerns with electronic voting, and ongoing improvements, titled "Federal Efforts to Improve Security and Reliability of Electronic Voting Systems Are Under Way, but Key Activities Need to Be Completed".

3. Hypothesis and Research Question

From where blockchain technology arise? Blockchain technology comes from the concept of Bitcoin [2] because bitcoin is the digital currency through which we can transfer the funds and operating independently of a central bank. What issues generated blockchain?



ISSUE	RESPONSE
<i>Technology Risk</i>	
Scalability Block size, Consensus method	Regular global technical meetings (Satoshi Roundtable); vociferous debate/proposals (democratic power struggle) PoW: not scalable, PoS: validator model too complicated
Mining Centralization 51% Attack	Temporary; mining is collusive; attack unsustainable, cannot steal coins, confirm transactions or change protocols
Cybersecurity Hacks Mt Gox, Ethereum DAO, Bitfinex	Building resilient system constantly under open attack 24/7 (remember early Internet DNS attacks)
<i>Perception Risk</i>	
Silk Road, drug dealers, terrorists, criminals	Blockchains are a universal technology available to all; non-criminal activity predominates
<i>Regulatory Risk, Economic Risk</i>	
Government regulation, bans; Exchange rules	Governments modernizing economic infrastructure with blockchains too; licensing, open dialogue

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Blockchain

PoW: Proof of Work (mining), PoS: Proof of Stake (validated voting) - mechanisms for establishing ledger state consensus
 Early Internet: "It's all never scale, insecure, not reliable", Yahoo, AltaVista down for days due to DNS attacks

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Fig. 1:-Issues of blockchain technology

Figure 1[6], represents the blockchain issues with their responses.

It covers the following risks like Technology, Perception and Regularity etc. Is blockchain effective on digital voting? Yes, it is much effective, like Certainty in tabulation of vote, E2Everifiable i.e. End to End auditable voting system, Open source, Cost and Time effective, Empty voting would be transparent.

4. Methodology

The voter downloads and installs the voting booth then securely submits identity information for verification with register for the election they qualify to vote in. Now, the voter has been authorized to cast a ballot by both the [3] ID verifier and registrar. The voter then votes and submits their ballot to a secure blockchain based ballot box, while retaining anonymity and ballot secrecy. Using their vote account, the voter can go into the ballot box and verify for themselves that their vote was cast as intended. The voter can even audit each ballot and the ballot box to confirm the election results are accurate. If a voter changes their minds, they have the ability to change their vote at any time in the days leading up to the election.

5. Discussion

Paper Based Voting has many disadvantages but it also has some advantages over the digital voting. Internet access cannot be available to all backward people or it's also possible that if some people know how to access the internet they do not know how to do online voting. Now a days literacy rate increases so it can be able to access the internet this overcome the disadvantage (early thinking). Another advantage over digital voting is that security attacks like data hack by hacker cannot be possible in paper based voting system. But online voting has the advantages like capture of booth, theft of ID's and pressurization of people cannot be done. We discussed digital voting using blockchain, as we know blockchain is not 100% secure due to public ledger because all the ledger people can access the information of each other. From our point of views this problem can be overcome to some extent by applying some cyber technique like Authorization, Authentication, Policies, Data credentials, etc. After survey we came to know that countries like Brazil and Netherland as implemented this process but due to lack of security as one group member can access the account of other group member, that's why they have drop this idea, but country India is deeply interested to implement in the future, by performing some extra effort to make it secure so that group member can only read the account of other group member or member can access the account of other member only if that person and other group member allow to access it, from this we can overcome from the situation. Now the problem arises that people who are educated but can't effort high speed internet and device to proceed the process, and who are uneducated then make aware of them then provide the facility for the above so, this facility should be provided by government, atleast for the above functionality.

6. Result

From a above discussion we obtained a result that a paper on "remote electronic voting and turnout in the [4] Estonian 2007 parliamentary elections" showed that rather than eliminating inequalities, e-voting might have enhanced the digital divide between higher and lower socioeconomic classes. People who lived greater distances from polling areas voted at higher levels with this service now available. The 2007 Estonian elections yielded a higher voter turnout from those who lived in higher income regions and who received formal education. Some countries such as Netherlands and Germany have stopped using it after it was shown to be unreliable, while the Indian Election commission recommends it. The involvement of numerous stakeholders including companies that manufacture these machines as well as political parties that stand to gain from rigging complicates this further. A 2017 study of Brazil found no systematic difference in vote choices between online and offline electorates. However, it has been also argued that the rigging of EVMs influenced the results of elections in India in 2017 to a large extent. "Blockchain is interesting but does not solve many of the issues relating to Internet voting," responded Pamela Smith.

7. Conclusion

We find in our review that digital voting through block chain technology has some issues and effectiveness but our concern is to focused that how much we make this technique more effective. Here, our main focus is that how we can implement this technique in our daily life. Our country India is deeply interested for future use and lots of effort are being done to overcome the security issues as early as possible

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