

# SAFEGUARDING ELECTORAL INTEGRITY: DESIGNING A BLOCKCHAIN-BASED VOTING SYSTEM TO COMBAT ELECTION FRAUD

PRESENTED BY FEMMESEC (GROUP C)

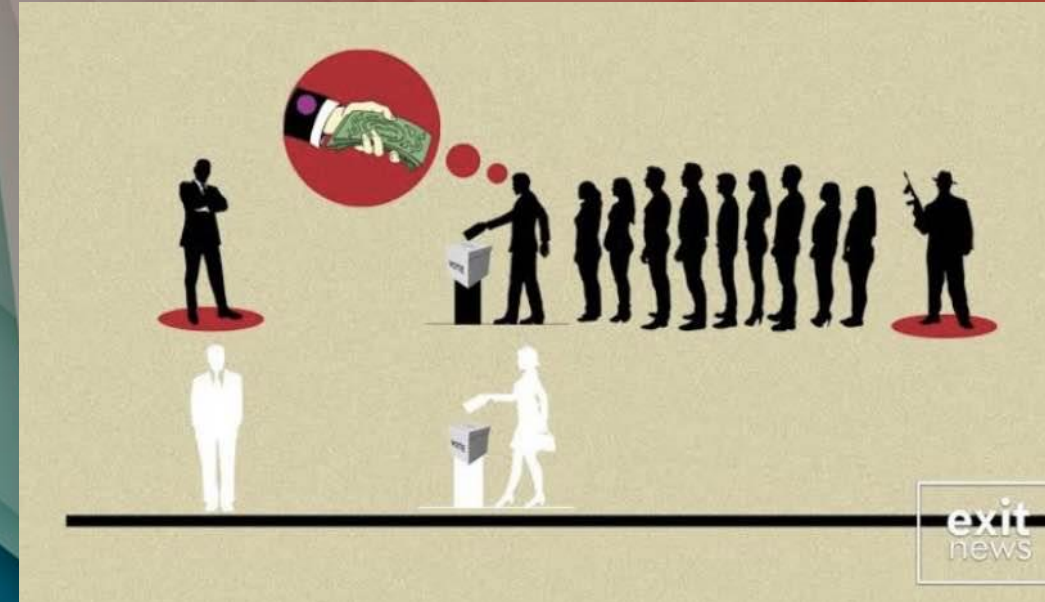
# NAMES OF ACTIVE GROUP MEMBERS

<b>Names</b>	<b>Task</b>
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<b>Endework Abera Zeleke, Apata Oluwatobi Omolade, Lydia Solomon, Priscilla Takon</b>	<b>Slide 9 Research Group</b> (Contribution of solution on SDG 16)
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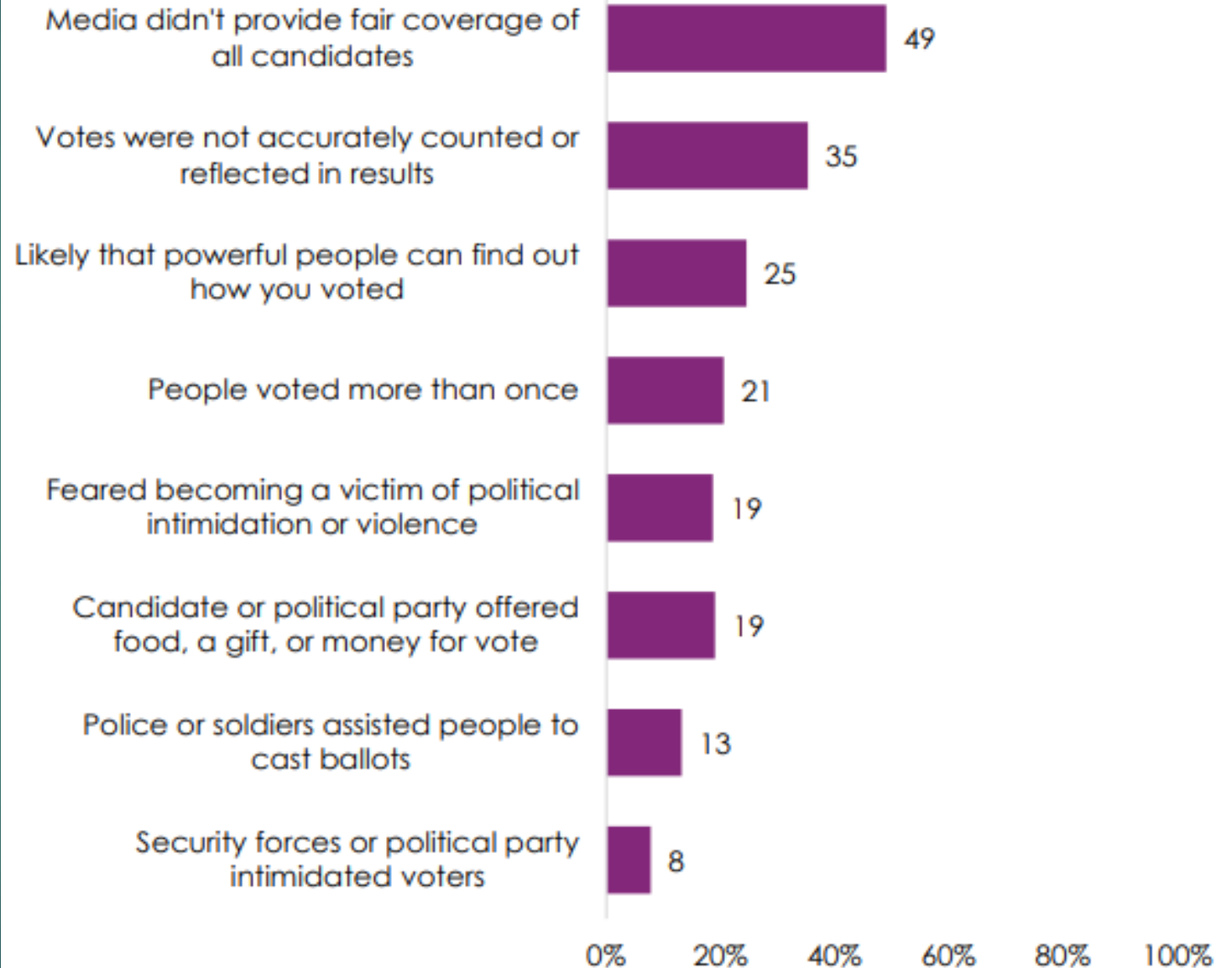
# INTRODUCTION

The problem with contemporary voting systems is that they are subject to vulnerabilities, which, if exploited, pose a significant risk of election fraud.

Safeguarding electoral integrity is a critical issue across Africa, where the magnitude of election fraud and its implications for democracy are profound.



# THE ELECTORATE'S PERCEPTION OF ELECTION CREDIBILITY (34 COUNTRIES)





# FACTORS IMPACTING THE INTEGRITY OF ELECTION

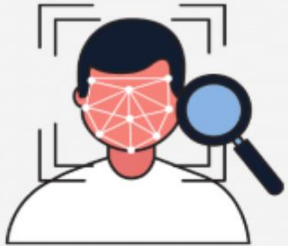
- **Manipulation of Information**
- **Equipment Failures and Supply Issues**
- **Alteration or Destruction of Ballots**
- **Counting Errors and Reporting Inaccuracies**
- **Weak Electoral Institutions**
- **Political Manipulation**

# BENEFITS OF BLOCKCHAIN BASED VOTING SYSTEM



## 1 A DECENTRALIZED DATABASE

Even if a hacker compromises one node, he can't bring down the entire network.



## 2 BIOMETRIC VERIFICATION

Blockchain technology demands verification of ID before you can take an action.



## 3 SECURITY

The use of private and public key mechanisms and cryptographic encryption ensures security.



## 4 TRANSPARENCY

The voting process is visible in real time while protecting individual secrecy.



## 5 GENERIC ARCHITECTURE

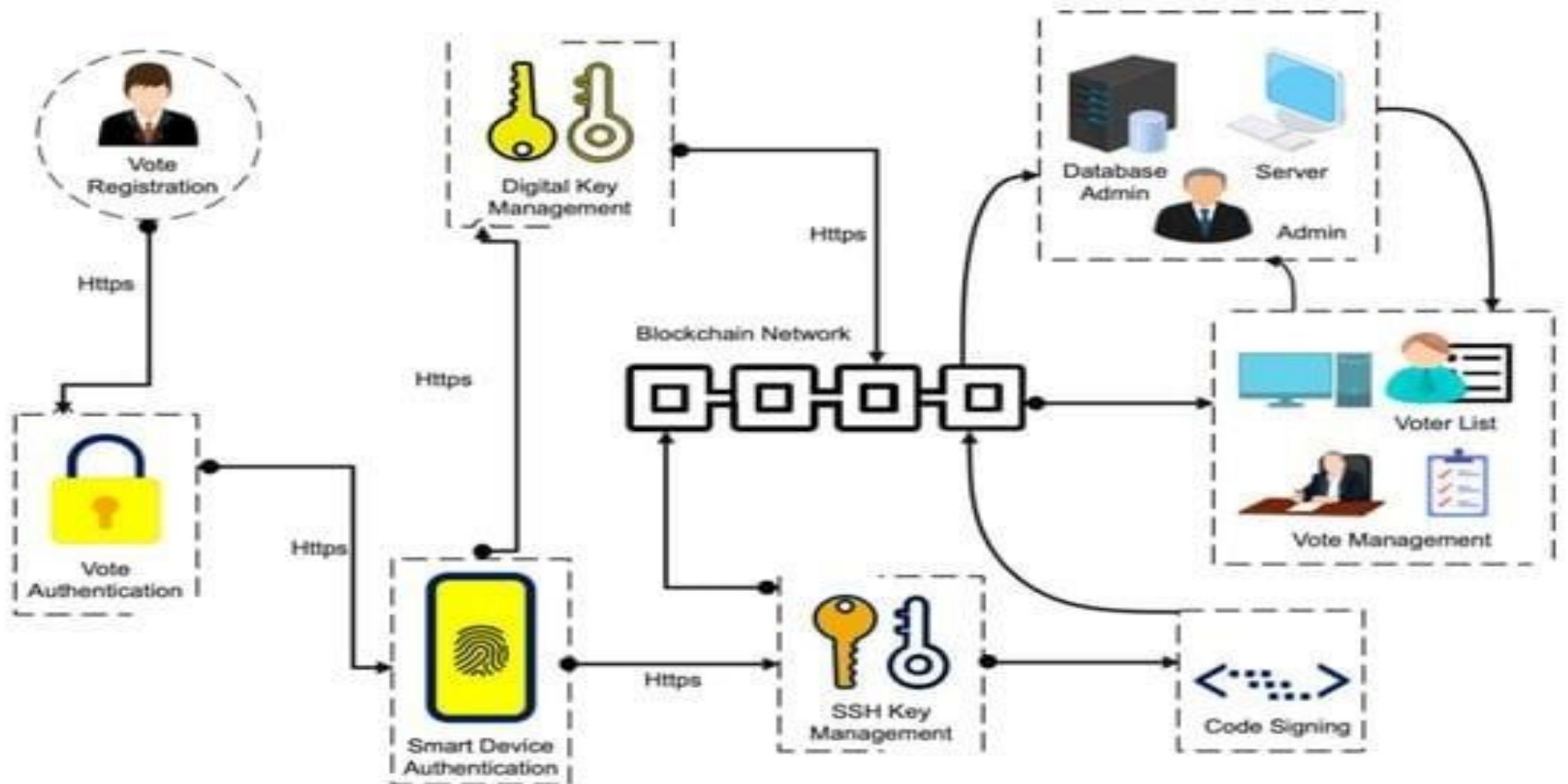
Anyone can create Use Cases on top of the blockchain technology used.



## 6 ENVIRONMENTALLY FRIENDLY

Voting ballots and logistics cause a lot of emissions. By using new mining technologies the ecological footprint of blockchain is far lower.

# BLOCKCHAIN VOTING SYSTEMS ARCHITECTURAL OVERVIEW (HYPERLEDGER FABRIC)





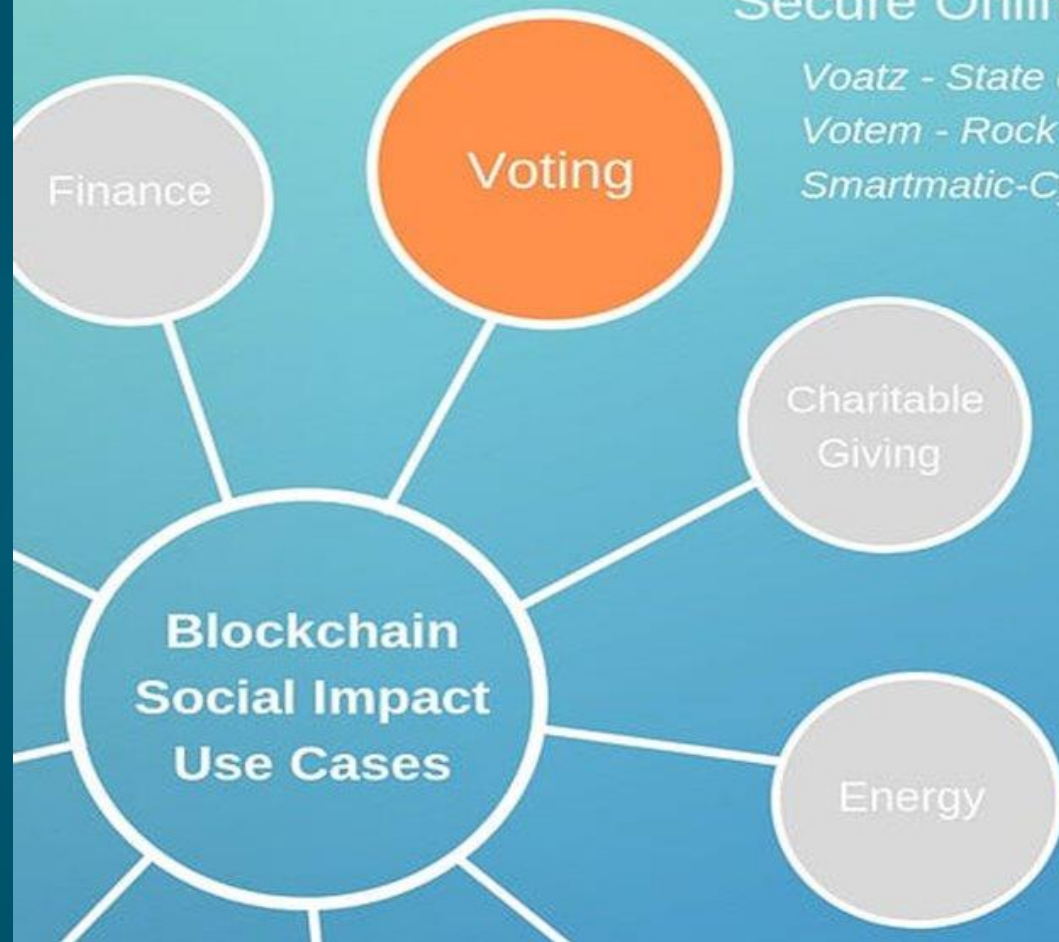
# CASE STUDY

## Secure Online Voting - Government & Private

*Voatz - State of West Virginia, 2018 Federal Elections, USA*

*Votem - Rock and Roll Hall of Fame, 2017 & 2018 Inductee Voting, USA*

*Smartmatic-Cybernetica - Utah GOP Presidential Candidate Elections, 2016, USA*







# CONCLUSION

In conclusion, the implementation of the blockchain-based e-voting system offers secure, transparent, and efficient voting processes. Embracing this technology can revolutionize election systems by ensuring trust and accuracy in the electoral process.

THANK YOU FOR YOUR ATTENTION

# REFERENCES

- <https://www.afrobarometer.org/wp-content/uploads/2022/09/AD549-PAP15-Support-for-elections-weakens-in-Africa-Afrobarometer-Pan-Africa-Profile-6sept22.pdf>
- <https://fastercapital.com/content/Exploring-the-Power-of-Hyperledger-Fabric-in-Blockchain-Technology.html>
- [https://issuu.com/ijraset/docs/online\\_voting\\_system\\_using\\_block\\_chain/s/23086203](https://issuu.com/ijraset/docs/online_voting_system_using_block_chain/s/23086203)
- [https://docs.google.com/presentation/d/1r0AOTilkdaKqoW823u44t7fWNtyWkpxEgWV6P1mdqYo/edit#slide=id.g2c18f902d97\\_0\\_0](https://docs.google.com/presentation/d/1r0AOTilkdaKqoW823u44t7fWNtyWkpxEgWV6P1mdqYo/edit#slide=id.g2c18f902d97_0_0)
- <https://www.mdpi.com/1424-8220/21/17/5874>