Efficiency and Risks of E-voting

Kartik potdar and naveen shetty

[1] *Student, Masters of computer Applications, Cmr University, Karnataka, India*
[2] *Student, Masters of computer Applications, Cmr University, Karnataka, India*

ABSTRACT

electronic voting holds the promise by transforming by improving accessibility convenience and efficiency it can significantly enhance voter participation by making voting more accessible for individuals with disabilities those residing abroad and people with limited time e-voting can accelerate vote counting and result tabulation potentially lowering administrative costs and burdens associated with traditional paper-based voting systems furthermore incorporating advanced technologies can enhance ballot design reduce errors and ensure greater accuracy in capturing voter intent however e-voting also introduces significant risks that need careful management key concerns include security with potential cyber-attacks hacking and tampering threatening election integrity ensuring voter privacy and ballot confidentiality poses another major challenge alongside maintaining transparency and public trust technical issues such as software bugs and system failures can disrupt the voting process and undermine confidence in the results additionally the digital divide may exacerbate inequalities as not all voters have access to the necessary technology or digital literacy to effectively use e-voting systems

Keyword - *e-voting electronic voting democratic processes accessibility voter participation abroad voters time constraints paper-based voting*

1. INTRODUCTION

the rise of e-voting represents a significant shift in how democratic elections are conducted as societies become more digitized integrating technology into the electoral process promises to enhance efficiency accessibility and voter engagement e-voting encompasses various methods such as internet voting electronic voting machines evms and mobile voting applications all designed to streamline the voting process and create a more seamless electoral experience the potential benefits of e-voting are compelling by leveraging technology e-voting systems can make voting more accessible for individuals with disabilities those in remote locations and citizens living abroad additionally the convenience of e-voting could lead to higher voter turnout by reducing the time and effort required to participate in elections the rapid processing capabilities of electronic systems also promise quicker vote tallying and result reporting enhancing the efficiency and responsiveness of the electoral process however transitioning to e-voting involves navigating numerous challenges and risks to preserve election integrity cybersecurity threats such as hacking and malware pose significant risks to the confidentiality and accuracy of electronic votes ensuring voter privacy and ballot secrecy is another critical concern as is maintaining transparency and public trust in new systems additionally technical failures software bugs and the digital dividewhere some segments of the population lack access to the necessary technology or skillsfurther complicate widespread e-voting adoption this paper aims to explore the benefits and risks associated with e-voting drawing on global case studies and current technological advancements by examining the successes and challenges faced by different countries in implementing e-voting systems valuable insights and best practices can be derived ultimately this analysis seeks to inform policymakers electoral bodies and the public about harnessing the advantages of e-voting while mitigating its risks ensuring a s

1.1 Literature survey.

increased accessibility and voter participation e-voting systems are lauded for their potential to increase accessibility and voter participation research by duenas-cid et al 2020 highlighted the land islands internet voting project

demonstrating how e-voting could facilitate voting for residents abroad and those with disabilities similarly alvarez and hall 2009 noted that estonias internet voting system significantly increased voter turnout by providing a convenient and accessible voting option cost-efficiency and administrative benefits the cost-efficiency of e-voting systems has been extensively debated krimmer et al 2020 developed a methodology to calculate the cost-efficiency of different voting methods finding that internet voting could be cheaper in the long run due to reduced administrative burdens and quicker vote tallying studies on swiss e-voting pilot projects also indicated potential cost savings and efficiency improvements braun brndli 2006 security concerns and cybersecurity threats security remains a significant concern with e-voting park et al 2021 highlighted the risks of cyber-attacks and hacking suggesting that internet voting could exacerbate vulnerabilities compared to traditional voting methods a systematic review by ta and tanrver 2020 emphasized the need for robust security measures to safeguard integrity by e-voting systems privacy and voter confidence captivating voter privacy with maintaining people trust are critical challenges for electronic voting systems alvarez and hall 2004 underscored the main aim of safeguarding voting confidentiality to obtain breaches both build public confident in e-voting swiss pilot projects also highlighted necessity transparency and rigorous testing to maintain voter trust braun brndli 2006 technological failures and the digital divide technical issues such as software bugs and system failures will disrupt the process of e-voting undermine confident in its outcomes the land islands project faced significant technical challenges that affected its implementation duenas-cid et al 2020 furthermore the digital divide poses a risk of disenfranchising voters without access to the necessary technology or digital literacy research by garg et al 2019 on blockchain-based e-voting systems suggested that while blockchain could enhance security it also requires substantial technical infrastructure and user proficiency blockchain tech e voting been in proposed as a solution with some secured and sustained issues in e-voting studies by zheng et al 2017 and vivek et al 2020 explored the potential blockchainto create tamper-proof alsotransparent vote system however park et al 2021 cautioned this transitioning from internet voting tech blockchain tech could introduce new tasks and complexities global case study and implement experiences global scenario provide valuable insights into the successes challenges in voting implementationestonias experience as detailed by alvarez and hall 2009 serves as a model for other countries considering internet voting the swiss and land islands projects also offer lessons on the importance of comprehensive planning rigorous testing and addressing technical and security issues braun brndli 2006 duenas-cid et al 2020

1.2 Proposed System

e-voting offers significant benefits and notable risks that must be carefully balanced one of the primary advantages in increased availability allowing more people including those with the handicappedor living in remote areas take part in elections conveniently it can also streamline process of e-voting reducing the time and resources required for ballot counting and potentially increase in voting turnout due to ease of the use add 0n e-voting can offer quicker results and enhanced accuracy in tallying votes minimizing human error associated with traditional paper ballots however these benefits come with substantial risks security is a major concern as e-voting systems can be vulnerable to hacking fraud and technical failures potentially compromising the election result integrity ensuring confidentiality both privacyfor voters choices is another challenge as electronic systems must be robust against breaches that could expose individual votes moreover the digital divide poses a risk where those without access to technology or the internet may be disenfranchised to mitigate these risks rigorous testing transparent and methodology comprehensive securityscale upmust be implemented

2. Experimental Setup / Compassion Analysis

participants and sampling

participants a broad group and part is selected to participate in the study to the group individuals of different age part socio-economic statuses educational backgrounds and technical proficiencies special attention is given to include disabilities and individuals to assess the accessibility features of the e-voting system

sampling method near helps in obtaining a extensive understanding by the usability and attainability voting system systems evaluated voting system eve this contains internet voting electronic machines eves even mobile voting applications traditional vote system tvs transcript ballots physical location boots experimental conditions normal voters conditions regular scenarios both standard voter turnout stress conditions scenarios simulating high voter turnout potential cyber-attacks and technical failures to test the resilience of the systems metrics and data collection

usability metrics time taken to cast a vote error rates and user satisfaction are recorded security metrics incidents of fraud vulnerability to hacking and overall system security are assessed through vulnerability scans and simulated attacks accessibility metrics ease of use for the voter with disabilities including the available support corporate overall user experience voter turnout comparison of voter turnout rates between eves and TVs cost analysis evaluation of implementation and operational expenses for both systems including setup costs maintenance and administrative overhead comparative analysis efficiency and accessibility eves shows improved efficiency with quicker vote counting and result tabulation enhanced accessibility allows more people including some with disabilities and for all living remote areas to take part in elections higher user satisfaction is reported due to the convenience TVs while old systems are familiar and trusted by many they are often slower in vote counting and more resource-intensive in terms of manpower and materials liability and security eves despite advanced security measures e-voting systems remain vulnerable to cyber-attacks hacking and technical failures ensuring voter privacy and maintaining public trust are ongoing challenges -TVs traditional voting systems are less vulnerable to cyber-attacks but are not entirely free from risks such as ballot tampering and fraud cost-effectiveness -eve original setup costs like e-voting that can be high but endless operational costs may be lower due to reduced administrative burdens quick reduces the overall election cycle time TVs traditional systems may have lower initial costs but incur higher long-term operational expenses due to manual vote counting and extensive administrative including

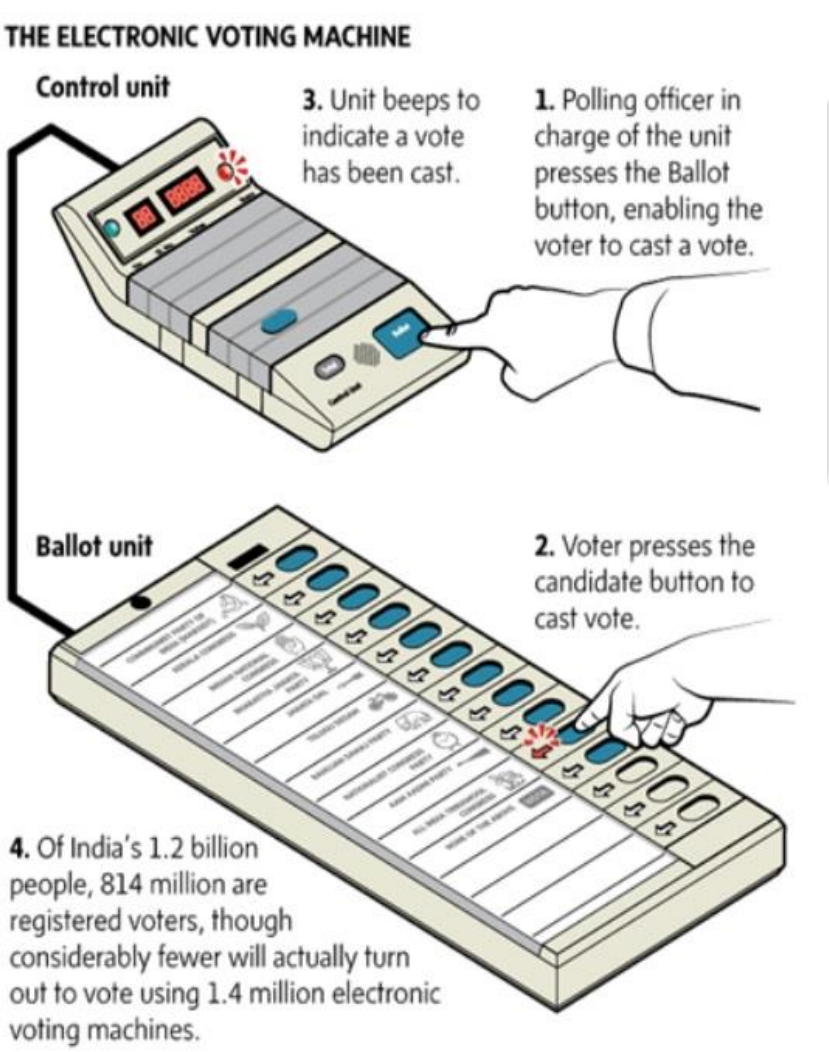

Chart -1 Polling booth

Introduction related your research work Introduction related your research work Introduction related your research work Introduction related your research work Introduction related your research work Introduction related your research work Introduction related your research work.

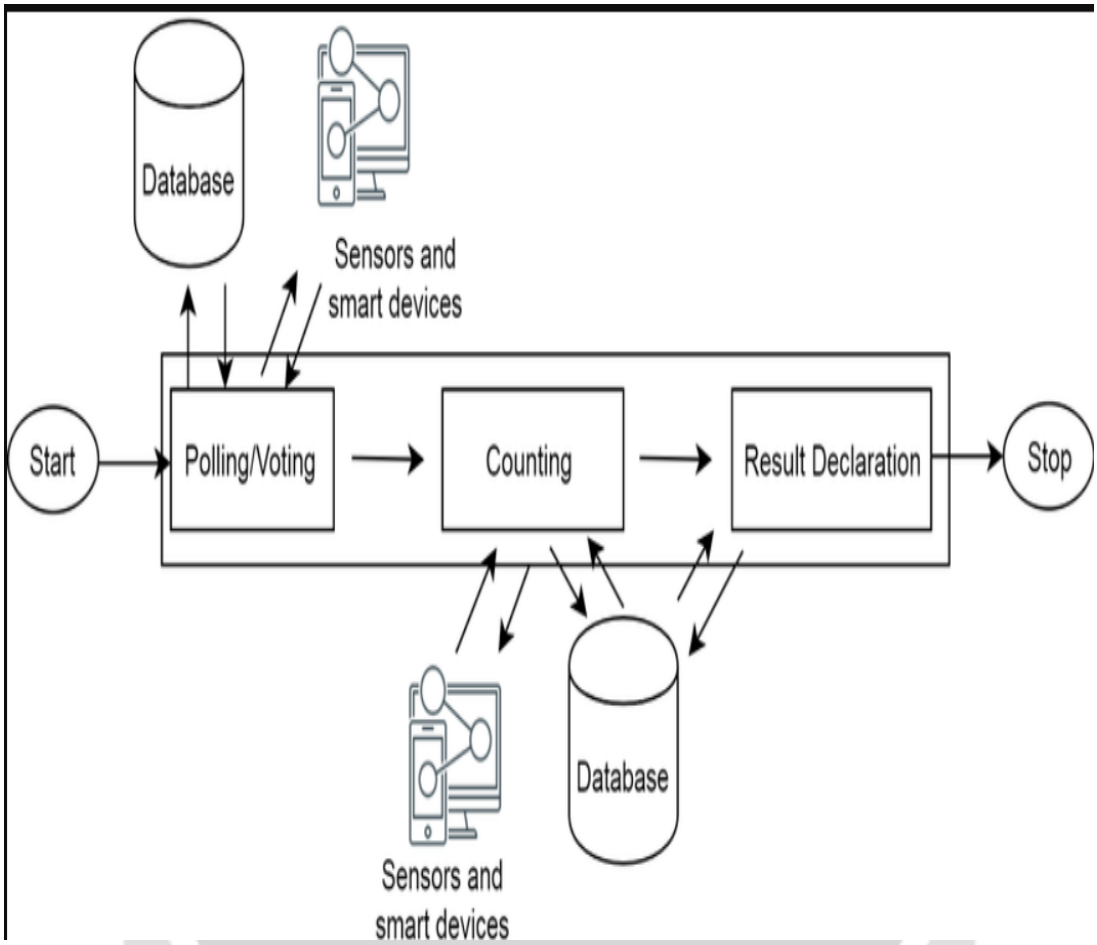

Fig -1: Overview of polling process

3. CONCLUSIONS

This research underscores the courage of e-voting to implement online process by increasing availability efficiency by the voter turning out e-voting systems offer significant advantages including the convenience the internet voting quick vote tallying and cost-effectiveness in the long run however the study also highlights fearful upcoming risks particularly regarding secured voter privacy and the digital divide believing robust advanced network voter confidentiality addressing to the needs of all citizens are paramount to announcing the pure implement of e-voting future research and practical implementations must continue to focus on developing secure user-friendly and inclusive e-voting system for uphold their initial of sequential processes

4. REFERENCES

[1]. D. Duenas-Cid, I. Krivonosova, R. Serrano, M. Freire, and R. Krimmer, ‘‘Tripped at the finishing line: The Åland islands internet voting project,’’ in Proc. Int. Joint Conf. Electron. Voting. Cham, Switzerland: Springer, 2020, pp. 36–49.

[2]. R. Krimmer, D. Duenas-Cid, and I. Krivonosova, ‘‘New methodology for calculating cost-efficiency of different ways of voting: Is internet voting cheaper?’’ Public Money Manage., vol. 41, no. 1, pp. 1–10, 2020.

[3]. S. Park, M. Specter, N. Narula, and R. L. Rivest, ‘‘Going from bad to worse: From internet voting to blockchain voting,’’ J. Cybersecurity, vol. 7, no. 1, pp. 1–15, Feb. 2021.

[4]. K. Garg, P. Saraswat, S. Bisht, S. K. Aggarwal, S. K. Kothuri, and S. Gupta, ‘‘A comparitive analysis on E-voting system using blockchain,’’ in Proc. 4th Int. Conf. Internet Things, Smart Innov. Usages (IoT-SIU), Apr. 2019, pp. 1–4.