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INTERNET VOTING AS A CATALYST FOR DIGITAL DEMOCRACY: EVIDENCE FROM E-ESTONIA

Qaseem Zahra[1], Dr. Ali Shan Shah[2]

[1]MPhil Scholar, Department of Political Science Government College University Faisalabad. Email: qaseemzahra18@gmail.com
[2]Assistant Professor, Department of Political Science Government College, University Faisalabad. Corresponding author, Email alishanshah@gcuf.edu.pk

Abstract
The swift digitization in democratic procedures has brought internet voting as a potential catalyst for digital democracy. This research paper provides an understanding of the Estonian Internet voting model to study the impacts of I-voting on democratic participation and trust of the public. The primary data is used for collecting the actual shards of evidence, and secondary data is used for the analysis and evaluation of the information. The findings reveal that democratic participation increases because of the implementation of Internet voting in Estonia. The analysis highlights the challenges faced by the Estonian electoral officials. The research provides informative material about the potential of Internet voting for e-democracy.

Keywords: Internet voting, I-voting, EIV, Digital democracy, Estonia, Public trust, Voter turnout.

Introduction

The digitization in the sphere of politics, especially in governance, has sparked global attention towards internet voting as a potential catalyst for digital democracy. Internet voting has the potential to enhance voter turnout and modernize the democratic process by allowing voters to cast votes securely and comfortably.

Estonia has been at the forefront in the matter of internet voting. It is regarded as E-Estonia because of its highly advanced digital governmental and electoral system. Estonia has a special electoral system, regarded as the most advanced electoral system. The advanced part of their electoral system is internet voting (different from electronic voting). Estonia sets an example for other countries with its digital advancements. In Estonia, Internet voting was initially available for local (2005), parliamentary (2007), and presidential elections (2011). The EIV (Estonian Internet Voting) mechanism is grabbing the attention of the world. Internet voting is a direct way to engage the public in the electoral process by providing comfort and security for their vote.

This paper examines the role of the internet voting system in digital democracy with a focus on its evolution, public trust, and electoral outcomes, with special reference to Estonia. This paper evaluates whether internet voting increases or decreases the democratic participation of Estonia. The official electoral results are assessed comparatively. The voter turnout of the internet voting method versus the voter turnout of the traditional voting method is studied deeply. Furthermore,

the results add to the broad debate concerning whether internet voting strengthens or weakens digital democracy in the context of Estonia.

Research Questions

How is Internet voting enhancing democratic participation in Estonia?

Research Objectives

- To investigate the role of Internet voting and its implications for the digital democratic process in the modern era.
- To understand the contribution of internet voting to the advancement of digital democracy in Estonia.
- To assess how i-voting has changed voter turnout.
- To evaluate citizen trust in i-voting in comparison to conventional voting techniques.
- To examine the perception and level of satisfaction of Estonians about Internet voting.

Research Methodology

The qualitative and quantitative method is utilized for conducting research. This research is based on a single case study of Estonia. Estonia is chosen as a model for understanding the value, need, and impacts of Internet voting in the digital age. Estonia sets an example by successfully implementing Internet voting. The data gathered from primary and secondary sources for the extensive analysis of Estonian Internet voting in digital democracy. The combination of these sources improves the accuracy of the findings by confirming the data with official records.

Literature Review

Ahmed and Pattanashetty discussed about new emerging technology of online voting system. The revolution of emerging technologies is making life more comfortable and easier. Every field of life is now under the influence of technology. The new technologies introduced the OVS (online voting system), which is a healthy step towards a fair voting system (Ahmed & Pattanasetty, 2024). The writers focused on the benefits, advantages, and security features of the online voting system, but it doesn't provide empirical evidence to support the efficiency of OVS (online voting system). The research aims to cover all these mentioned research gaps by providing a study about the existing OVS of Estonia with empirical evidence.

Clarke and Martens mentioned that Estonia has the most established digital voting system in the world. The writer used the term advanced voting process for the internet voting of Estonia. It investigated the digitized national identity card of Estonians, which plays a key role in digital voting. The latest technological methods are used by Estonians to conduct a highly secure internet voting system. The Internet voting system, its components, and system performance are also described. The writer also provided the assumptions and perceptions about internet voting in Estonia (Clarke & Martens, 2022). This piece of paper lacks an analytical approach, as writers provide no analysis of the results before and after the use of Internet voting in Estonia. The research aims to give an analytical study of the I-voting of Estonia from 1992 to 2023.

Sertkaya, Roenne, and Ryan figured out the EIV (Estonian Internet Voting) scheme in a brief way. This piece of writing summarizes the important features of secure elections in Estonia. The writers elaborated that internet voting is the subject of electronic voting that relies on Estonian electronic identity cards. According to writers, the security scheme of EIV supports voters' privacy. Voter authentication and vote encryption are the most significant phases of their digital electoral system, while the privacy of voters is the main concern. They also mentioned that the EIV scheme has been used since 2005 for nationwide elections in Estonia that are organized by

the Estonian state electoral office (EO) (Sertkaya, Roenne, & Ryan, 2022). This study lacks the process of Internet voting. It just describes the features of secure online elections. The research aims to fill the gap by adding the process of internet voting of Estonia in detail.

Weingartz analyzed the effect of Internet voting on voter turnout in Estonia. Estonia is the leading state in introducing the smartest technology for casting votes for its citizens. Estonia is the only state in the world that has introduced I-voting for all levels of elections in the state. This system is highly appreciated by the citizens of Estonia, and this also increases voter turnout as it provides comfort to the public. The consumption of the latest technology is the focal choice of Estonians, as they are a pioneer nation in digitization. It attracts the attention of new voters. Internet voting has been an option for voters with the ability to use the traditional method of voting (Wigartz, 2017). This paper lacks the records of voter turnout. The research line-up is to study the EIV (Estonian Internet Voting) with an analysis of the implications of Internet voting on digital democracy. The voter turnout from 1992 to 2023 was also studied.

Sal explored the relation between Internet voting and the voter turnout with special reference to Estonia. He mentioned that voter turnout represents the quality of democracy. Many theorists consider voter turnout a strong indicator of the quality of democracy. According to the writer, internet voting makes it possible to enhance voter turnout. Online voting gives voters a comfort zone. According to the writer, in the matter of internet voting, Estonia is at the head of the pack. In Estonia, RIV (remote internet voting) decreases the barriers for voters, making voting easy (Sal, 2015). The writer briefly analyzes the effect of remote voting on voter turnout, but he neglects the implications of remote voting on democracy and its process. The research impetus is to fill these mentioned gaps by studying the implications of i-voting for digital democracy in the special context of Estonia.

Karg emphasized the brief analysis of the electronic voting in Estonia since 2005-11. The writer noted that e-voting is the tool of e-democracy. The Estonian government's use of technology to improve the effectiveness of the public sector. The e-voting initiative was Internet voting as a key component for Estonia's digital democracy. The discussion about the implementation of internet voting in Estonia started in 2001 in parliament. Riigikogu passed an appropriate bill—the Digital Signature Act 2002. The act formed a legal basis to conduct online voting. The Electoral Commission began to implement the project of the e-voting system in the second half of 2003 (Karg, 2011). The study lacks the analysis of Estonia's elections of 2015, 2019, and 2023. The research purpose is to provide an analysis of Estonia's election results from 1992 to 2023.

Alvarez, Hall, and Trechsel discussed Internet voting in Estonia. The Estonian voting process has three important characteristics that enable online voting: an extensive use of the Internet, a legislative framework addressing online voting, an identity system enabling digital voter authentication, and a political climate that encourages online voting (Alvarez, Hall, & Trechsel, 2009). The writers mainly focused on the introduction to the Estonian Internet voting system while ignoring its effect on their digital democracy. The research purpose is to fill this gap by giving a study of the Internet voting process and its impact on digital democracy with special reference to Estonia.

Šilhavy and Silhavy mentioned the usage and need of digital electoral systems in digital democracies. The writers used the example of Estonia as the smartest technological Internet voting mechanism, and for electronic voting, they put Geneva. Internet voting is the easiest and fastest form of voting. They also added that remote voting makes voting comfortable and flexible for everyone, and it can have a chance to increase the turnout (Šilhavy & Silhavy, 2008). The writers used Estonia as the best example for a digital electoral system, but they didn't mention the voter turnout record, as well as the impact of internet voting on Estonian digital democracy, which was also not checked. The research aims to fill these mentioned gaps by providing a study of Estonia's internet voting mechanism with its voter turnout statistical record since 1992-23.

Estonia's Internet Voting model

The democratic societies are built on trust (Haarseim, 2022). Digital voting is a tool of digital democracy (Ahmed & Pattanasetty, 2024). The voter turnout is one of the main indicator that reveals the quality of democracy. Many theorists consider voter turnout a strong indicator of the quality of democracy (Sal, 2015). The internet voting makes voting comfortable and flexible for everyone, and it has the chance to increase the turnout (Šilhavy & Silhavy, 2008). The innovative technology of internet voting is inclusive compared to exclusive means of political engagement and can reduce societal gaps. Internet voting decreases the cost of voting, and the public mostly prefers it because people think it's the cheapest way to cast a vote via the internet (Trechsel, Gasser, Kucherenko,, & Silva, 2016). Internet voting allows voters to cast votes via the internet from any place, either from home, the office, or any other location (valimised, 2024). There are many factors involved in the successful adoption of internet voting in Estonia, like extensive use of the Internet, a legislative framework addressing online voting laws, a smart identity system enabling digital voter authentication, and a political climate that encourages online voting (Alvarez, Hall, & Trechsel, 2009).

Estonia emerged as global leader in e-governance and in internet voting (Mackisack, 2023). Estonia is small and well-digitized nation (Trechsel, Alvarez, & Hall, 2008). In Estonia 100% public services are available online for 24 hours a day. Digital democracy and open data ensured by the Estonian government (E-Estonia, 2024). The most advanced service of Estonian e-governance is their internet voting. Estonia is only democracy in world which allows such online voting system (Berson, 2018). The highly advanced, easy-to-access, and well-structured online voting system is Estonian Internet Voting (EIV) (Smartmatic, 2024). Estonia is the only state in the world where internet voting has been used since 2005 for municipal elections. The internet voting was used for parliamentary elections for the first time in 2007. This system is highly appreciated by the citizens of Estonia (ec.europa.eu, 2016). The utilization of the latest technology is the focal choice of Estonians, as they are a pioneer nation in digitization (Wigartz, 2017).

Evolution and Process of I-Voting

The Estonian government's use i-voting initiative as a key component for their digital democracy in 2001. The discussion about the implementation of electronic voting in Estonia started in 2001 in parliament. Riigikogu passed a bill—the Digital Signature Act 2002. The act formed a legal basis to conduct online voting. The Electoral Commission began to implement the project of the i-voting system in the second half of 2003. Finally, for the first time, i-voting was implemented in 2005 for municipal elections. In 2007, internet voting was implemented for parliamentary elections for the first time (Karg, 2011).

The latest technological methods are being used for conducting highly secure internet voting systems (Clarke & Martens, 2022). The stronger authentication ways are using in EIV (Estonian Internet Voting) (Summers, 2016). In Estonia, voting allows for 7 days legally. Internet voting is organized by the State Electoral Office. The national smart ID card and a digital device (such as a mobile, computer, laptop, or tablet) with a secure and high-speed internet connection. After online submission of a vote, if the voter wants to change the vote, he/she can change the vote but only during the election period. Since 2021, internet voters have been allowed to change their vote on the last day (Sunday) of the election at the polling station. For this instance, the voter has to visit the polling station and cast a vote by paper ballot (valimised, 2024). Voter authentication is a significant phase of their digital electoral system, while the privacy of voters is the main

concern (Sertkaya, Roenne, & Ryan, 2022).

Steps for voting online in Estonia:

i. Download the voter application from the website valimised.ee.
ii. Voters should have a valid identity card and identity card reader or mobile ID and the necessary PIN code.
iii. The computer or laptop should be connected to the internet and have the latest digital signature software.
iv. Start the voter application and identify with an ID card or mobile ID.
v. Find a candidate and select.
vi. Confirm vote with digital signature.
vii. Read the detailed instructions that the application gives after casting a vote.

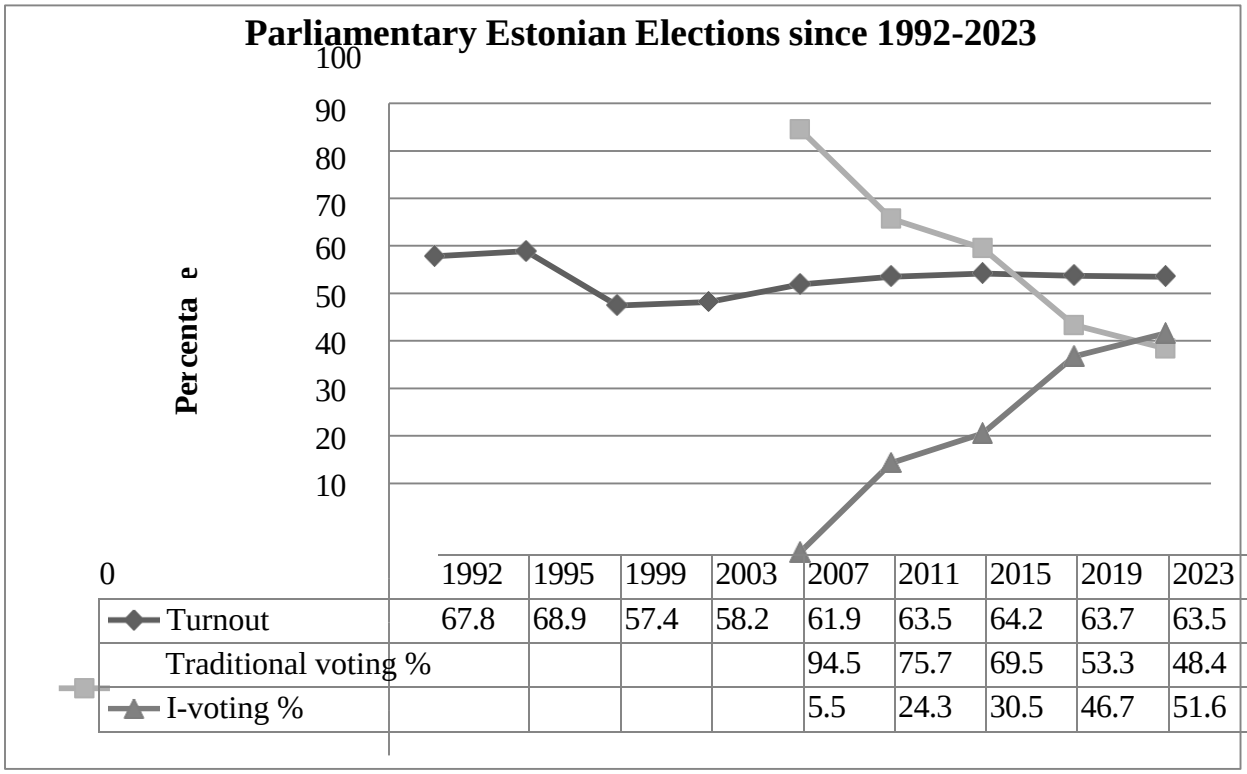
Evidence from Estonia

Estonia is the first nation in the world where the public supports internet voting rather than traditional voting. I-voting is supported by the Reform Party and their followers, while the followers of EKRE (Eesti Konservatiivne Rahva Erakond, or Estonian Conservative People's Party) prefer the traditional voting method (Jourdain, 2023). The interest of Estonians in internet voting remains high in 2023 elections (OSCE, 2023). The 51% voters cast vote via internet voting (Valimised.ee, 2023). The number of I-voters has gradually increased with each election since 2005. Participation in elections is not compulsory according to the Estonian constitution. The increase in the percentage of I-voters shows the confidence of the public in I-voting, especially about how much Estonians feel secure casting a vote via the internet through a few clicks (Piirmets, 2023).

Report of Parliamentary Elections 2023 of OSCE (Organization of Security and Co-operation in Europe) by the Department of ODIHR (Office for Democratic Institutions and Human Rights) Election Expert Team (EET)

The electoral process of Estonia meets international standards. The legal structure of Estonia's line-up elections effectively includes internet voting, but with minor technical issues, such as the validity process in internet voting and mistrust of some citizens in the EIV. The trust in public about i-voting, can enhance if electoral officials consider the concerns of public regarding i-voting and try to address almost all concerns. The technical issues can be reduced by deploying i-voting experiment on small scale prior to elections. The election was fair and free from fraud. The parliamentary election was observed by the NEC (National Electoral Committee). The internet voting opened for the 2023 parliamentary elections from 27 February at 09:00 am to 04 March at 08:00 pm. The State Information Authority (RIA) operates internet voting mechanism for responding to cyber-attacks. RIA performs security assessments from time to time to check the security strength and privacy pattern of the internet voting software. There were no cyber-attacks in the 2023 Estonian parliamentary elections. ODIHR EET expressed trust in RIA for their efforts to protect digital elections from cyber-attacks (ODIHR, 2023).

Empirical Evidence



(Source: valimised.ee)

Analysis

The percentage of overall voter turnout shows the total number of voters who participated in elections over the mentioned years. The figures show a relatively stable line with slight fluctuations between 61.9% and 64.2% from 2007 to 2015 and 63.7% and 63.5% from 2019 to 2023.

The line of TVM reflects the decline in TVM usage. The line shows a decline from 94.5% in 2007 to 48.4% in 2023. It reveals the gradual shift away from TVM among Estonian voters.

The section of IVM indicates the percentage of those voters who adopted the digital voting methods. It shows the increase rising from just 5.5% in 2007 to 51.6% in 2023. The upward trend of IVM highlights the growing preference for digital voting solutions in the environment of electronic democracy among the Estonian voters.

Findings

The adoption of internet voting in Estonia is increasing as per the election.

The Estonians are confident about their I-voting system.

The legal supervision and the procedural security measures are preserving electoral legitimacy in Estonia.

The number of voters increased after the implementation of internet voting in the parliamentary elections of Estonia.

Lessons for other digital democracies

EIV as pioneering digital voting platform provides significant insights for digital democracies. Some are following:

- Invest to build well-developed digital infrastructure. The majority of political parties should supported technological initiatives for the development of digital democracy.
- Digital ID cards should be allotted to adult citizens for proper digital governing functioning.
- Educate public about internet voting.
- Introduce digital voting platforms such as internet voting with backup voting method such as paper voting.
- Enhance cyber-security protocols for secure environment. Collaborate with cyber- security teams or companies.

Barriers for the EIV process

Estonia is marked as a leader in innovation but still faces some challenges, as follows:

- The digital divide between the urban and rural areas is one of the biggest challenges for Estonia's government.
- The internet voting of Estonia is still at risk of malware attacks through voter devices, which can disrupt the system or process.
- Estonia has a prime digital democracy and digitized democratic facilities but still has a voter turnout of just 63% in the last parliamentary election, which was held in March 2023.
- Some people in Estonia are still not trusting of EIV (Estonian Internet Voting), which decreases the voter turnout.

Conclusion

The swift acceptance of internet voting and the increase in voter turnout according to official electoral records prove that internet voting is catalyzing Estonian digital democracy. The internet voting has been an essential component of the digital society of Estonia since 2005. The consistent increase in internet voters reveals the public's trust in EIV and its proper functioning. Fortunately, EIV is supported by the public, a framework of digital infrastructure, a robust identity card system, and a culture of technical trust. These elements might be difficult or impossible to exist in other democracies. The problems, including the digital divide, malware risks, ongoing transparency requirements, and mistrust in other democracies, show that internet voting is not a solution that can be applied worldwide for increasing voter turnout or democratic participation. The other digital democracies can learn a lot from Estonia's internet voting model. The internet voting has the potential to revolutionize the electoral process to meet the needs of modern times. I-voting can serve as a game-changing instrument for enhancing voter turnout in digital democracies if it is implemented carefully.

Recommendations

The recommendations are the following:

I. To reduce the digital divide issue, the government should work on making internet access available in rural areas for the availability of high-speed internet networks. This will increase the voter turnout.

II. The government should launch programs via online platforms to educate the public about the dangers and prevention of malware attacks on their own devices.

III. For enhancing the voter turnout, the IT team should send registered voters notifications via message or email alert that have direct access through the link of the Internet voting portal. These kinds of messages give an alert to voters and leave a reminder to cast a vote with a single click.

IV. The AI chat box should operate on official Estonian electoral websites to provide immediate responses to FAQs about elections, especially about internet voting.
V. The members of the electoral department should collaborate with universities and other organizations for the youth to promote internet voting.

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