FUTURE OF E-VOTING IN GEORGIA

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INTRODUCTION

The imbalance in the summary protocols of the results of the October 31, 2020, Parliamentary Elections, delayed release of results, and other shortcomings[1] identified in the election process created distrust in the election results and sparked the demand for fundamental reform of the election administration. In the package of possible changes, on which a political consensus has not yet been reached, the issue of the introduction of electronic voting technologies was raised.[2]

In the fall of 2020, the Covid-19 pandemic created additional challenges in administering the elections. A real dilemma has arisen between protecting public health and ensuring citizens could exercise their fundamental right to vote. Maintaining this balance has become one of the key challenges for the election administration. The Central Election Commission (CEC) did not have the resources to provide voters with mobile boxes during the October 31 parliamentary elections – thus, some citizens were deprived of their rights to participate in the elections. Only 10,845 isolated (either at home or at in-patient facilities) voters were provided with the mobile ballot box when almost 30,000 citizens were in isolation[3]. The pandemic has made the issue of online voting more urgent.

The transition to e-voting is considered a progressive step in administering the elections, as it significantly increases the efficiency of election administration, the speed and accuracy of the election results, and consequently, builds confidence in the election administration. With proper management, automation of electoral procedures can eliminate or significantly reduce the opportunity for fraud, accelerate the vote tabulation and, in the long run, optimize election expenses too.[4]

Unfortunately, not all attempts to introduce e-voting have been equally successful. Nor are existing technologies flawless. The reasons for failure can be purely technical, as well as management issues, and most importantly, a lack of trust in the process due to deep skepticism about new technologies. Superficial and incoherent attitudes towards electronic technologies can damage the electoral processes and institutions for a long time and profoundly. That is why international organizations advise governments to dedicate proper time and resources to their introduction.[5]

The purpose of the paper is not to promote or oppose e-elections. It is designed for informational purposes for those who are directly involved or will be involved in the introduction of electronic technology. This includes the election administration, political parties, media, and international and local observer organizations. This publication should also be interesting for all active citizens who care about the fate of elections and democracy in Georgia.

1   Office for Democratic Institutions and Human Rights, Georgia Parliamentary Elections. October 31, 2020. ODIHR Limited Election Observation Mission Final Report, March 5, 2021: https://bit.ly/2RwdsAC

2   Civil.ge, "Georgian Dream Key Points of the Citizens' Memorandum," January 30, 2021: https://bit.ly/34PX6pz

3   Netgazeti.ge, "Only 12.6% of those in self-isolation will be able to use the portable box," October 30, 2020: https://bit.ly/3fWG5jL

4   Goldsmith Ben, Ruthrauff Holly. Implementing and Overseeing Electronic Voting and Counting Technologies. 2013: https://bit.ly/3w319dV

5   Council of Europe, E-voting handbook - Key steps in the implementation of e-enabled elections, 2010: https://bit.ly/3cmntHC

ABOUT ELECTRONIC VOTING

Electronic voting can be found in one form or another in the world's leading democracies and developing democracies. Remote, internet voting is institutionalized in relatively smaller, developed, or historically conflict-free countries.[6]

E-voting has a broad definition and involves holding elections and referendums using electronic technologies for voter identification, vote casting, vote count, and tabulation. At present, the election administration of Georgia does not use electronic technologies for any of these procedures, which leaves the space for modernization.

E-voting technologies can be introduced in any type of electoral system. Thus, no electoral system is a barrier to e-voting. Simply put, under different types of management, this process can be efficient. Electronic voting can take place both in an environment controlled by the election administration, at the polling station, as well as outside it, when voters can vote remotely using internet-connected technology. There are various models of e-voting being used, and Georgia should select the most optimal model considering some of the best practices from other countries' experiences and its own unique socio-political context.

Electronic technologies can be introduced nationwide, as well as in some districts or constituencies - for pilots. The pilot of e-voting technologies has already been held in Georgia: Tsaishi constituency - 2018 and Tkibuli - 2019. Based on this experience, the election administration believes that the introduction of electronic technologies for future elections is quite plausible. But a very short time left until the 2021 local self-government elections allow only an extended pilot. It is relatively realistic to introduce voter registration-verification technology, which will be followed by the gradual spread of other technologies.[7]

This analytical document attempts to introduce and discuss various electronic technologies, their suitability for Georgia's context and analyze the challenges that accompany the introduction of electronic technologies in the current social and political context. An analysis of the experience of different countries will give the reader a clear picture of the prospect of e-voting in Georgia.

The recommendations presented in the final chapter of the document are universal and fundamental. However, it includes major recommendations proper implementation of which will determine the success of this project.

TYPOLOGY AND CHARACTERISTICS OF ELECTRONIC TECHNOLOGIES

There are many configurations of e-voting. This paper identifies three main election procedures that can be automated by using technology: (1) voter identification, (2) voting casting, and (3) counting & tabulation. The practice of remote/online participation in elections is discussed separately. From country to country, different models of automation of these procedures can be found. For example, the process is practically fully automated in Canada, India, the United States, France, Estonia - though the technologies used in these countries differ.[8]

According to the latest data from the International Institute for Democracy and Electoral Assistance (International IDEA), electronic technologies have already been introduced in various forms in 32 countries out of 177. Fifteen countries use integrated electronic voting and counting technologies, some of which leave paper traces and some not. In 9 countries, only Direct Recording Voting Machines (DRE) are used - some leave a paper trail and some don't. Only in four countries, the process is automated in such a way that after voting on the electronic device, the ballot paper is printed

6   Ellis Andrew, Navarro Carlos, and et al. Voting from Abroad, The International IDEA Handbook, https://bit.ly/3uRwgrH

7   Interview with Giorgi Sharabidze, Deputy Chairman of the Central Election Commission, April 1, 2021

8   Goldsmith Ben, Ruthrauff Holly. Implementing and Overseeing Electronic Voting and Counting Technologies. 2013: https://bit.ly/3w319dV

through the electronic device. Remote voting is institutionalized in 10 countries (see Annex: Map 1). The use of electronic technologies for voter identification is relatively widespread - based on the same source, it is being used in 42 countries (see Annex: Map 2).

The types and characteristics of these technologies are discussed in detail in the following chapters. They are used either in an environment controlled by the election administration or outside. The practice of participating in elections remotely is also discussed in the following chapter.

VOTERS IDENTIFICATION-VERIFICATION

The first important procedure is to identify the citizen who came to the polling station. Usually, after presenting the ID card, the person is found on the voter list, and both the citizen and the member of the precinct commission will sign his/her participation in the elections. This procedure can be automated, and this, in the first place, essentially eliminates the malicious practice of multiple voting by one voter, which, along with observer organizations, is skillfully observed by the media in Georgia.[9]

There are two main ways to identify a voter who came to the polling station: a biometric ID card and/ or a fingerprint. Most technologies are designed to have a unique fingerprint identification mark.

With the simplest approach, it is possible to equip polling stations with computers, where an electronic list of voters is loaded with the appropriate program. In addition, a special reading device (Machine-readable Zone - MRZ) is needed, which perceives the voter's ID card and finds the relevant person in the unified list of voters. This practice, which has already been introduced and tested in Moldova, may not necessarily be a breakthrough in electronic technology, but it is enough to substantially eliminate the practice of repeated voting and thus strengthen confidence in elections.[10]

Fingerprint identification is the most effective practice. The Electronic Voter Identification Device (VAD) stores a unified list of pre-loaded voters and unique information about each, including a fingerprint. Voters arriving at the polling station will register their participation in the elections with a fingerprint on an electronic device. This system was introduced in neighboring Armenia, where the 2018 parliamentary elections collected fingerprints of voters, which would facilitate the identification of citizens in each subsequent election.[11] The adoption of this model should be the most convenient and realistic for the election administration of Georgia.[12]

The Canadian example is even more sophisticated. According to the voter list, the Canadian Election Administration sends an individual barcode (QR Code) to all voters before the election. With this certificate, a citizen must appear at the polling station, where a special device will read their individual card, search the electronic voter list and allow them to participate in the voting.[13]

THE VOTE CASTING

Electronic Voting Machines *(EVMs)* actually fall into two main categories: integrated voting and counting machines that summarize the results themselves *(Direct Recording Electronic Voting Machines (DRE))* and electronic voting machines that do not store the results and print information on-site electronic ballot paper *(Electronic Ballot Printers - EBPs),* where the voter's choice is already reflected.[14]

As mentioned, both functions are integrated into the voting and counting machine (DRE). It allows the voter to record the decision electronically. The device perceives a person's choice and remembers it. For summarizing the data accumulated in one

9   International Society for Fair Elections and Democracy (ISFED), Final Report on Monitoring the 2020 Parliamentary Elections, 2021: https://cutt.ly/RnHZzvA

10   International Republican Institute, IRI Moldova International Election Observation Mission Final Report, February 2019. https://bit.ly/3x5OCqr

11   OSCE Office for Democratic Institutions and Human Rights, Interim Report. Election Observation Mission Republic of Armenia, November 28, 2018: https://bit.ly/34SQqXz

12   Wolf Peter, Introducing Biometric Technology in Elections, International Institute for Democracy and Electoral Assistance (International IDEA), 2017: https://bit.ly/3fUBPB7

13   Goldsmith Ben, Ruthrauff Holly. Implementing and Overseeing Electronic Voting and Counting Technologies. 2013: https://bit.ly/3w319dV

14   Stenbro Martine, A Survey of Modern Electronic Voting Technologies, June 2010: https://bit.ly/3cm8qhe

device, they are transferred to the server via the Internet or a memory card.

Voting and counting machines (DRE) are of two types: which leaves the so-called "paper trail" - "Voter Verified Paper Audit Trail (VVPAT) and without this feature. The advantage of VVPAT technology is that the solution fixed on the electronic device is printed out and appears behind the transparent glass of the device. The printed confirmation cannot be touched by the voter; they just see it for a few seconds to make sure it is correct. The printed bulletin will be cut after few seconds and moved to the inside of the device. The advantage of the VVPAT device is that it neutralizes the suspicion of the voter about an incorrectly recorded choice. Electronic devices that work without "paper trails" somehow evoke the feeling of "blind" voting. Clearly, the devices that leave a paper trail are complex, and training commission members, informing voters, and keeping the system running smoothly becomes an additional concern for election administration.

Electronic Ballot Printers (EBPs) are a type of electronic ballot machine on which the voter can make his or her choice, and the machine prints the finished ballot instantly. Such voting machines are simpler than the integrated voting and counting machines described above because they divide the voting process into two parts - as in the traditional procedure: fixing the ballot paper and placing it in the ballot box. The printed ballot paper can usually be placed in a ballot box or in a ballot scanner where the voter's choice will be recorded and counted to other results[15]. Despite their simplicity, these devices are no longer popular because, functionally, others are more loaded, and therefore, the cost incurred on them is more justified.

It is better for Georgia to choose a voting machine that leaves a "paper trail" or does not completely restrict the voter's contact with the ballot paper. This device is advantageous due to two reasons: due to low technological skills and great skepticism about the electoral process, it is better for the voter to make sure at the polling station that their choice has been properly recorded; In addition, as noted above, verifying the results of any precinct with a "paper trail" will help build confidence in

the election. VVPAT devices would be a suitable technological solution for Georgia. However, due to their high cost, their introduction in a short period of time is less realistic.

VOTE COUNT

The vote casting and counting process are two different procedures of one chain. It is not necessary to automate them synchronously. It is possible to introduce electronic voting without voice counting technologies and vice versa. Also, voting and counting votes through different devices.

These two procedures can be combined in electronic elections if they are performed using the DRE technology described above. As we have seen, they not only involve the direct voting procedure but also automatically count the votes and show the results as well.

Bulletin scanning technologies, Optical Mark Recognition (OMR) devices are mostly used for automatic voice counting. In this case, the voter marks the choice on a special sheet of paper with a special pen, which is perceived by the device scanner. While scanning the ballot papers, the machine automatically "sees" and saves the voter's choice and the corresponding result and prints it in a few seconds after closing the polling station.[16] According to common practice, it is not necessary for identification machines to be placed at all polling stations. It is possible to summarize ballot papers collected from polling stations across the district in the shortest time by using a scanner.

Optical recognition devices are very convenient for Georgia because, through them, the voter has an interrelation with the paper ballot, which also is evidence and is crucial in auditing the results. Most importantly, it responds directly to the challenges that have been observed, especially during the recent parliamentary elections: late voting and errors in summarizing. In addition, OMR machines are cheaper than integrated voting and counting machines (DRE) and are technically easier to

15 Council of Europe, E-voting handbook - key steps in the implementation of e-enabled elections, 2010: https://bit.ly/3cmntHC

16 Goldsmith Ben, Ruthrauff Holly. Implementing and Overseeing Electronic Voting and Counting Technologies. 2013: https://bit.ly/3w319dV

operate. They were used by the Georgian election administration to pilot by-elections in recent years. You will read about these experiments in the following chapters.

INTERNET VOTING (I-VOTING)

Not everywhere, where elections are automated through electronic technology, online voting is allowed, and vice versa - wherever remote voting is possible, electronic technologies are not found in polling stations. Such as, for example, Australia, New Zealand, Estonia. However, in parallel with automated voting at the polling station, in Canada, remote voting is also institutionalized.

The online voting procedure is conducted using personal, Internet-related technology in the individual environment of the voter not controlled by the election administration. Special online voting booths may also be located at polling stations, as it is in Estonia.[17] Voting online in an environment not controlled by the election administration requires special security measures to prevent the interference of harmful actors.

Academic research does not confirm that the practice of voting online increases voter turnout.[18] Voter comfort and access to the election process are the two biggest advantages of voting online, compared to other automated procedures. Online voting is a way for people with disabilities and citizens abroad to exercise their right to vote. Often due to local restrictions, Georgia can only open polling stations in embassies and consulates, which limits the participation of immigrants in elections.

More than half of the Georgian emigrants, about 450 thousand people, live in Russia.[19] The election administration believes that, due to the threat posed by Russia, the right of citizens living there to participate in the elections online is an unjustified

risk, as it is in Russia's interest to interfere in the Georgian elections or try to influence it through cyber-attacks or other manipulations.[20] This threat significantly hinders the introduction of online voting practices for voters outside Georgia.

> Estonia has been one of the champions of online voting since 2005. This initiative has had high public support from the very beginning, which is not surprising because confidence in institutions is high in Estonia, as well as the level of technological development and degree of polarization is low. This confidence was not undermined even by the massive hacker attack carried out before the 2007 elections. In the 2011 parliamentary elections, 24% of voters voted online. Later, in 2019, this figure increased to 44%. Estonia gives the population the opportunity to vote online one week before the elections. The Pre-election of a voter is void if he/she comes to the polling station and votes on the spot. In this way, Estonia maintains the practice of participating in a civic ritual by coming to the polling station. [21]

ADVANTAGES OF E-VOTING

The diversity of electoral technologies indicates that there are many technical possibilities for electronic elections. Therefore, the experience of the countries is different. The use of electronic technology has its risks. However, because of these risks, it is unreasonable to abandon them. With proper management and a supportive socio-political environment, the introduction of electronic technologies can eliminate a number of systemic shortcomings and simplify the electoral process.

17 International IDEA, Introducing Electronic Voting: Essential Considerations, December 2011:https://bit.ly/3fW4ZAb

18 Aman Adhy, Bakken Mette, Out-of-Country Voting, Learning from Practice, International Institute for Democracy and Electoral Assistance (International IDEA), 2021: https://bit.ly/3pt6FUY

19 Pew Research Center, "Origins and Destinations of the World's Migrants, 1990-2017", February 28, 2018: https://pewrsr.ch/3uYqJQ7

20 Bonke Olaf, Chikhladze Mariam, Parelo-Plesner Jonas, Election Risk Monitor Georgia, December 2020: https://bit.ly/3bI6Nux

21 Aman Adhy, Bakken Mette, Out-of-Country Voting, Learning from Practice, International Institute for Democracy and Electoral Assistance (International IDEA), 2021: https://bit.ly/3pt6FUY

SPEED AND ACCURACY:

When using electronic technology, the possibility of human error or manipulation decreases in the summary protocols of the results. Voting and counting machines, individually or integrated, perceive the choice made by the voter and offers summary results in the shortest time after the closing of the polling station, unlike the reality when the counting of votes is delayed for hours after the closing of the polling station, and the preliminary results are published. The announcement of a 7.5-hour delay in the preliminary results of the 2020 parliamentary elections, according to "Transparency International - Georgia," was a deterioration in the practice of recent years and has raised suspicions of internal manipulation for part of the public.[22] The automation of the process allows the sounds to be summarized with maximum accuracy in a minimum of time. Process automation reduces the possibility of human error or deliberate manipulation.

PREVENTION OF FRAUD:

Electronic technologies are essentially and naturally impartial, and it is this feature that makes them credible and effective in the long run.

Voting and counting technologies at the polling station level can prevent the harmful experience of "ballot stuffing" in ballot boxes. Also, electronic voter identification technologies can substantially eliminate the vicious practice of multiple voting. The ability to vote online protects voters at and around the polling station from possible pressure and intimidation, as it allows them to vote in an individual environment isolated from external influences.

COST-EFFECTIVENESS:

Election-related costs are quite high. The 2020 parliamentary elections cost the CEC about 34 million GEL (excluding the cost of advertising and funding for election subjects), which is about 10 GEL per registered voter (3,511,853). [23] In the long run, e-elections can reduce the cost of printing and distributing ballots, as well as other administrative costs.

In Brazil, for example, where there are approximately 100 million voters, the introduction of electronic technology has cost more than $ 1 billion. However, over time, the cost per voter has decreased from $ 5 to $ 3. Cost-effectiveness has been even more impressive in highly populated India, where spending has fallen to $ 0.6 per voter. In Estonia, on the other hand, the introduction of online voting practices has reduced spending per voter from 1-5 to 0.1-0.5 euros.[24] According to 2020 data, the budget of the Georgian Election Administration was about 58 million (excluding funding for parties), and the registered voters - 3.5 million, which means a cost of about 16 GEL per voter.

INCLUSIVENESS:

For those groups of the public who are unable to reach the polling station, the election administration creates mobile boxes. Remote voting will reduce this effort and make it easier for many groups of voters to participate in the elections. These are people with disabilities, the elderly, the military, police officers, and others. Electronic devices can be programmed so that visually impaired voters can vote independently through audio. It is also possible to vote in the language of minorities, which will only improve the quality of their integration in Georgia.

Trust: Building trust in the system is the most critical and far-reaching challenge. Electronic systems are effective as long as people trust them. Building trust requires an appropriate social context and political consensus. E-elections have the potential to boost voter confidence in the electoral process. A more flexible, inclusive, fast, and manipulated system will increase the population's belief in elections and, consequently, in democracy.

22 Transparency International - Georgia, Summary of Observation Results of October 31, 2020, Parliamentary Elections, November 1, 2020: https://bit.ly/3vZbPtZ

23 Central Election Commission of Georgia, Resolution of the Central Election Commission of Georgia, 1/2020, №10/ 01/2020, on determining the rules for the distribution and use of funds allocated by the state for the 2020 Parliamentary Elections of Georgia, January 13, 2020: https://bit.ly/3wV5Zdg

24 International IDEA, Introducing Electronic Voting: Essential Considerations, December 2011: https://bit.ly/3fW4ZAb

RISKS ASSOCIATED WITH E-ELECTIONS

Automating well-trained and easy-to-observe election procedures leads to some confusion and mistrust. It is easier for parties, candidates, observers, and the media to navigate traditional electoral processes than to find out and participate in automated procedures. Therefore, the initial stage of the introduction of electronic technologies is often accompanied by a feeling of novelty, uncertainty, and ambiguity. These innovations, as already mentioned, have many advantages. However, they also come with risks. The risks associated with electronic technologies are mostly universal, but some may pose significant challenges given the local context.

In order for electronic technologies to be implemented in the long run and successfully, it is necessary to understand and avoid technological, financial, management-related risks, taking into account the socio-political context. Below we discuss the universal risks and bring them closer to the Georgian context. The same chapter presents their successful management models based on the experience of different countries.

LACK OF TRANSPARENCY:

Electoral technologies, unlike all other ICT (Information and Communication Technology - ICT) technologies, have a unique feature - to protect the secrecy of the ballot, the connection between the identity of the voter and the choice made is deliberately broken. If other technologies are designed from the very beginning to allow electronic activity to be verified for greater reliability, this is not the case in most electoral technologies. For example, in the case of a bank transfer via a mobile app, if we are not sure that the transfer was successful, we can check the transaction history. Electoral technologies, due to the secrecy of the ballot, do not maintain a link between the identity of the voter and the decision made.

In order to provide more transparency, voting and counting machines have been set up, which leave a "paper trail" (VVPAT) and allow the voter to be instantly convinced of the correct reflection of their

own vote. After a few seconds of verification, the link between voter identity and the choice made by them has broken again. By sharing this experience, the choice should be made on VVPAT devices in Georgia, the advantages of which over other risks will be discussed.

The United States, under the Help America Vote Act 2002, has invested heavily in the introduction of Integrated Voting and Counting (DRE) technology, which has left no "paper trail." However, the US Voluntary Voting System Guidelines (VVSG) issued by the US Election Commission in October 2007 set new standards. The document noted that devices that do not leave traces of paper contain security and transparency risks. That is why most states have switched to VVPAT devices by 2010. In 2020, a certain number of DRE devices were left in only eight states. [25]

RESULTS TABULATION AND AUDITING:

The advantage of voting on a traditional, paper ballot is that in the event of disputed results, ballots can be counted. Not all electronic voting machines have this feature. Post-factum audits of choices made over the Internet are also impossible.

Audit of election results is important both to build public confidence in elections and to increase acceptance of specific election technologies. In this regard, there are two solutions: VVPAT voting and counting machines, which leave a "paper trace," or just sound counting machines (OMR), on which a paper ballot is scanned. Using both technologies, there is a paper bulletin that can be recounted.

The need for counting votes arises in different cases: often, a certain number of randomly selected polling stations is required to verify the results. It may be necessary to recount due to the disputed results of a particular precinct/district or in cases where the difference between the votes received by the candidates is minimal.

25   Election Assistance Commission, A review of proposed Voluntary Voting System Guidelines, 2008: https://brook.gs/3w1eVO8

The advantage of VVPAT devices becomes crucial even when auditing election results. It allows the election administration, in order to increase confidence in the election results, to recount the votes at randomly selected or specifically disputed polling stations, which has happened repeatedly in India, where 13.7 million results counted by the VVPAT machine after the 2019 elections were recounted and no discrepancies were found between the audit results and the results processed by the electronic device.[26] Clearly, this has significantly strengthened confidence in e-elections and played a pivotal role in the democratic consolidation process.

SECURITY:

The security of electronic technologies is a significant challenge for the election administration, especially in the context of technological dependence on vendors.

Election administrations mainly have to procure electronic technologies from international vendors. The same way awaits Georgia. The electronic technologies created and experienced by international companies are protected by a code protected by intellectual and commercial property rights. Often companies' commercial software codes are available to election administration for a limited time and extent while testing the system. Disclosure of software makes the system more vulnerable to attack by internal or external malicious actors.

Security measures should protect the transmission of summary data from polling stations to the districts or to the upper level. The threat increases when the transfer is made via the Internet (modem or satellite device), so it is more proven to transfer the data to the Election Commission of the next instance with a memory card. Naturally, online voting is the most vulnerable in terms of security and can never be 100% secure, although the decision must be determined by an analysis of the benefits and risks.

In Brazil, which has a not-so-stable history of democratic development, political actors have often argued over election results - largely because of fraud and voter bribery. A working group led by the World Bank named e-elections one of the solutions, and after piloting, began introducing technology in 2000. Shortly afterward, the practice of falsification at the polling stations decreased, and consequently, the degree of confidence in the elections increased. In response to security concerns, in 2009, the election administration of Brazil held an open competition for hackers and security experts shortly before the election. However, no one managed to hack the system. This experiment significantly increased confidence in the electoral system, and Brazil became an example of success in this regard. [27]

FOREIGN INTERFERENCE:

In the last decade, especially after 2017, malicious actors have been actively interfering in elections in various ways to undermine public confidence in elections and damage democratic institutions. One of the most common forms of interference is a cyber-attack/hacking attack on election infrastructure. Electronic elections make the voting process vulnerable to cyber-attacks and hacking attacks. In order to disrupt the electoral infrastructure, malicious actors target the so-called electronic and online voting and counting software through so-called DoS (Denial of Services) operations and "fishing." Well-known perpetrators of cyber-attacks are Russia and China.[28]

During the 2017 election campaign of France, due to the growing threat from Russia, the government, based on the French National Cyber Security Agency, forbid online voting for French people abroad. Earlier in 2016, Mueller's investigation into Russian interference in the US presidential election found that cyber-attacks in many states had targeted voter databases and gained access to the information of millions of registered voters.[29]

27 Jordi Barrat i Esteve, Goldsmith Ben, and Turner John, International Experience with E-Voting, Norwegian E-Vote Project, June 2012: https://bit.ly/3fW5biN

28 Heritage Foundation, Growing Threat of Cyber Attacks, 2020: https://herit.ag/2RvmRZ4

29 American Constitution Society, Key Findings of the Mueller Report. 2019: https://bit.ly/34Pf1wy

26 Ravi Shamika, "How electronic voting machines have improved India's democracy," December 6, 2019: https://brook.gs/3fWA5Yo

COST-EFFECTIVENESS:

The introduction of electronic technology is a costly project, and it is quite difficult to determine this cost because it does not only involve the cost of technology. The total budget should include the costs of assembling and maintaining the entire infrastructure - depending on the specific technology. Additional funds are needed for system testing and certification, hiring and training of special technical staff, and most importantly, an information campaign.

On average, vote-counting machines (OMRs) are known to be cheaper ($ 4,000 per unit price) than devices with integrated voting and counting (DRE) functions. The counting machine can be placed at one or more polling stations across the district to count ballot papers collected from polling stations. As for the voting machine that prints the ballot paper, it is more expensive because the polling station needs 5-10 units and the price of each one ranges from $ 15,000 to $ 30,000. According to a study based on the Estonian example, the cheapest is online voting practice.[30]

LACK OF TRUST:

Confidence in elections is crucial for the public, political actors, and other groups in society to accept and recognize election results. In order to gain trust, it is necessary for the election administration to involve all stakeholders in the process. It seeks to meet relevant international standards for risk mitigation and respond to criticism or questions.

Electronic technologies, due to their relatively low public awareness, are accompanied by a lot of ambiguity from the very beginning, so this should push the election administration to do everything possible to make the process open, transparent, and credible. If trust is not achieved in the early stages of the introduction of electronic technologies, it will be doomed to a long-term failure, especially in a socio-political context where there is a strong, democratic, weak electoral tradition.

In Germany in 2005, after seven years of successful piloting, European Parliament elections were held using electronic voting devices. Several citizens sued in court, arguing that it was possible to infiltrate and manipulate the system. Thus, the credibility of the results of the 2005 elections was questioned, and the case went to the Constitutional Court, which declared the results of the 2005 elections unconstitutional. The court banned electronic elections in the future unless "paper traces" remain. This case has delayed e-elections in Germany for a long time.[31]

The example of the Netherlands shows how confidence in e-elections can be undermined even after a long period of successful implementation. The fact is that in 2006 a public group formed a movement - "We do not trust the voting machines." They were computer technology experts who examined the previous elections with voting machines and revealed some shortcomings in terms of security. Clearly, the media has paid close attention to this public concern. The Dutch government had to abandon the use of electronic systems and return to the traditional format.[32]

BLOCKCHAIN

Recently, the use of blockchain technology for election management has been actively discussed. Blockchain is a database to which each user of the network has the same access, where any changes (e.g., one additional transaction) are added as a new block and stored forever. Unable to delete, modify, and overwrite records currently in the database. Consequently, it is impossible to manipulate it or delete the traces of manipulation. Access to the blockchain database is universal for everyone. However, the user can make a new entry in the system only with his private key, in which no one can interfere.

30 Krimmer Robert, Duenas-Cid David, Krivonosova Iuliia, New Methodology for Calculating Cost-Efficiency of Different Ways of Voting: Is Internet Voting Cheaper? February 2020: https://bit.ly/3cmIBO3

31 National Democratic Institute, The Constitutionality of Electronic Voting in Germany: https://bit.ly/3z6P4Xa

32 Kshetri Nir and Jeffrey Voas, Blockchain-Enabled E-Voting. IEEE Software, 2018: https://bit.ly/3giqZnA

Thus, blockchain is decentralized, completely transparent, and secure, which is why it is used successfully in the field of financial transactions. For proponents of the introduction of technology in electoral processes, this technology has the main advantage over all other systems - it is impossible to delete, modify, replace or remake the record made in it through intervention. This is very important to protect the election results. Added to this is the cheapness of blockchain. Technology has primary, infrastructural costs, and election administration is no longer tied to colossal costs.

Despite these advantages, skeptics and cybersecurity experts point out several risks that make the use of blockchain in elections ineffective. Researchers at the Massachusetts Institute of Technology and Harvard[33] have identified shortcomings in blockchain technology that raise serious questions about the credibility and security of voting. For example, if blockchain technology creates a private, centralized protocol that does not fully replicate the mechanisms typical of blockchain - where the administrator sets the rules and oversees the process, such a system will not be fully protected. It was researchers at the Massachusetts Institute of Technology who concluded that a mobile application based on blockchain technology - Voatz was not secure - the outside actor was able to see who was voting and how. The Voatz mobile app was used in the 2016 US and 2018 municipal elections and by-elections.[34]

Clearly, the risk of introducing revolutionary technologies into the political process is high. However, for this reason, it is not worth falling behind in technological development. On the other hand, in the event of the intervention of internal or external harmful actors, unlike banking and financial transactions, the damage caused does not have a REVERSE button and procedure.

EXPERIENCE AND PROSPECTS OF E-ELECTIONS IN GEORGIA

Electronic technologies may be introduced in Georgia for the local elections scheduled for in autumn of 2021, but with a certain limit. Considering the costs and time required to purchase the technology, two types of technology can be introduced: Optical sign recognition electronic vote-counting machines. Voters can be identified with the ID cards that most of the population of Georgia has. Since the unified voter list does not include fingerprint data, it is possible that they will start collecting it during the self-government elections. This will replenish the base and make its use more effective for each subsequent election. As for voting and counting technology, based on the pilot experience conducted in recent years, the election administration has made a choice in favor of counting machines.[35] It is better for the election administration to draw up a plan for the phased implementation of the project and deploy electronic technologies in randomly selected constituencies in the upcoming local elections, as experience shows that the transition from traditional methods to new technologies is a long, challenging and a step-by-step process.[36]

TSAISHI AND TKIBULI PILOT PROJECTS:

In the by-elections held on May 13, 2018, in the Tsaishi local majoritarian constituency N 67 of Zugdidi constituency, the election administration used electronic technologies for the first time in the by-elections of the Sakrebulo. In particular, Optical sign recognition electronic vote-counting machines (OMRs). This project was implemented to study the introduction of modern election technologies in the Georgian election process. The results obtained with the electronic vote-counting machine were experimental, and the results calculated only by the traditional method counted by the members of the commission had legal force. Therefore, the political value of the Tsaishi experiment was quite low.

33 Park Sunoo, Specter Michael and et al., Going from Bad to Worse: From Internet Voting to Blockchain Voting, November 6, 2020: https://bit.ly/3fWaQ8i

34 Abazorius Abby, MIT Researchers Identify Security Vulnerabilities in Voting App, February 13, 2020. https://bit.ly/3g6MGH2

35 Interview with Giorgi Sharabidze, Deputy Chairman of the Central Election Commission, April 1, 2021

36 Herein

Based on the findings made in Tsaishi, the election administration used another by-election to pilot electronic technologies: on May 19, 2019, at the Sakrebulo by-elections, the Tkibuli and Tskaltubo 4-4 polling stations implemented a pilot project of electronic vote counting for the second time.

Electronic voting technology was assessed by the "Fair Elections" (and the International Society for Democracy) the process of electronic voting and identified shortcomings that are universal in such elections: breach of secrecy of voting, failure of technology, confusion of voters over new technologies and methods. Similar observations were made by the election administration, and after gaining experience in 2018, it managed to make the necessary changes to increase the efficiency of the technology. More specifically:

- Georgian voters are accustomed to marking/outlining a candidate. Elderly and visually impaired people had difficulty seeing and coloring the oval along with the candidate with a special marker. The vote count revealed that the apparatus was unable to read some of the ballots, and the results printed by the apparatus did not match the number of ballot papers in the box. That is why in 2019, the design of the ballot papers was changed in such a way as to better reflect the updated rules for the use of the ballot paper.

- Part of the voters incorrectly placed the ballot paper in a special frame envelope, and in several cases, the choice made in the ballot paper was visible, which violated the secrecy of the ballot.

- In one of the polling stations, the voting and counting apparatus was out of order for several minutes, due to which the voting process was temporarily suspended. However, the technical assistance resources available on-site were sufficient to deal effectively with the incident.

- In one of the polling stations, there was a case when a voter could not understand the instructions, expressed dissatisfaction, and left

the polling station without voting, despite the fact that the voter list had already been signed.[37]

It should be noted that the pilot elections were held in only three polling stations, and the process was attended by representatives of the CEC and the District Election Commission, who assisted PEC members when necessary. Consequently, there is a likelihood that the use of electronic counting machines on a larger scale, when it will be impossible to mobilize in all polling stations of the election administration, will increase the number of cases and shortcomings mentioned above. To carry out these experiments, the election administration cooperated with the Canadian international organization DELIAN, which in turn is a partner of a large Canadian company, Dominion (Dominion Voting Systems).[38]

Despite the shortcomings, the pilot projects implemented are promising. The election administration had the opportunity to better understand the prospects for the future use of electronic technologies and the associated risks. This experience can dictate the details of the process management directly to the election administration and conduct elections in a way that does not jeopardize the credibility and fairness of the election process and results in the eyes of voters, election subjects, or observers. As for Internet voting technologies, due to the growing threat of foreign interference from Russia, the election administration has no plans to introduce them in the near future.[39]

37 International Society for Fair Elections and Democracy (ISFED), Evaluation of Zugdidi Majoritarian By-Elections, May 14, 2018: https://bit.ly/3fUnzbG

38 Interview with Giorgi Sharabidze, Deputy Chairman of the Central Election Commission, April 1, 2021

39 Herein.

CONTEXT FOR E-VOTING

Public confidence in e-voting, as a novelty, is primarily determined by the existing socio-political context. Some of the universal factors that lead to skepticism about this novelty can be considered in advance, based on the experience of other countries. However, the local political and social environment also poses unique challenges. If trust in political institutions in the country is low and the political field is polarized, the prospects for electoral reform also become uncertain, as the success of the reform is determined by the supporting socio-political environment and political consensus.

Where civil society and political actors agree on electoral reform, it is possible to cover the management loopholes. But in the case of weak socio-political support, it is easy to delay reliable and well-functioning electronic technologies, as actors will be tempted to undermine public confidence in electronic systems by pointing out their imperfections.

In reality, e-elections significantly reduce the risk of manipulation and fraud at the polling station level, but the concentration of these risks shifts to the central level. Therefore, broad public trust in the election administration and political institutions, in general, is crucial in the successful implementation of electronic systems.

POLITICAL CONSENSUS

The introduction of electronic technology becomes easier when there is a political consensus on its advantages. Political players may oppose the introduction of technology because of both sincere concern and a lack of trust in the system in general. In a fragmented and polarized environment, political opposition may arise because successful reform is likely to be attributed to the ruling political force. In the face of heightened political opposition, the introduction of electronic technology in elections is a major challenge. That is why multi-party consensus and support are crucial to this serious project of modernization.

SOCIAL CONTEXT

Civil society, the media, and experts may have doubts and questions about e-voting. At best, they should be involved in the system implementation process, provided with information from the election administration, and able to express their views and criticisms while there is still time to resolve them.

Resistance with different content may arise in public: Some groups will feel sorry because of the transformation of the traditional civic ritual of voting; For some, this innovation will be unacceptable as it will be difficult to adapt to technological advancement; Others perceive it as a luxury and believe that such costly reforms, when other basic needs are not met, are done by a particular group to monopolize power. That is why it is important to communicate properly with different groups of the society - about the expected risks and short-term and long-term benefits.

RECOMMENDATIONS

The existence of a supportive socio-political environment is important in the introduction of electronic technologies. However, when trust is low, and there is no political consensus, proper project management, and technical operation are crucial.

The recommendations below are universal in nature and are based on observations from other countries. Each of them is tailored to the context of Georgia and addresses both the election administration and the other parties involved:

CAPACITY BUILDING OF THE CENTRAL ELECTION ADMINISTRATION:

For the proper implementation of the project, the election administration needs to have the appropriate expertise and capabilities to attract and involve other stakeholders.

In the long run, the election administration needs to increase its internal organizational capacity to have full control over the process; Cooperate with Vendor in the short term, however, so that process management remains the responsibility of the administration.

Once the available resources are assessed and it is better identified what kind of competencies are lacking in the election administration, training should be held for all three levels of commission members and additional technical staff. For digital and security management, the administration will need Vendor's involvement, although their roles and functions should be clearly defined.

COMMERCIAL ISSUES, PROCUREMENT, AND COSTS:

A cost-effectiveness analysis is required prior to actual procurement. The introduction of electronic technologies at an early stage is costly and may be the subject of speculation. Therefore, the service procurement process should be as transparent and fair as possible.

Technologies are evolving rapidly, and the country needs to think about what is better - buying technologies or renting them temporarily. Transfer of ownership will incur additional costs, such as maintenance, upgrading of equipment from election to election, and so on.

According to international experience, it is better not to sign a contract with the selected company until the validation test is performed, which is crucial to assess the shortcomings that accompany this or that system or may appear specifically in Georgia.

SECURITY AND TRANSPARENCY:

The guidelines advise countries to introduce already piloted technologies, the work of which the election administration is somewhat aware. In the case of Georgia, these are vote counting (OMR) machines that have already been used in the 2018 and 2019 elections.

It is important to check the software code and convince the public of its correctness and flawless. Since it is often impossible to fully disclose the software code due to vendor ownership rights, it would be good for CSOs that observe the election and a small group of experts to give access to the software code - to test it. This is an integral part of trusting the system and serves to ensure that no aspect of the system is left to be opaque and obscure to the public.

TESTING:

The election administration should conduct transparent and thorough testing of the system to ensure that political actors and other stakeholders ensure that the system is working properly and reliably. Different types of testing are required to determine how well the device is working, how safe and easy it is to be used by those in charge, and how easy it is to repair in an emergency.

It is also necessary to test the component of summarizing the results because it is important to convert and summarize the votes counted by individual devices in one receiving system. At all stages of testing and preparation of conclusions, the election administration should be at the forefront of the process. Testing must be done sometime before the election when there is still time to correct the defect found.

CERTIFICATION:

In addition to testing, certification is required prior to the use of voting and counting equipment to determine that the system is operating efficiently and meeting established standards. Certification helps the election administration build another layer of trust in the system. Unlike testing, this process must be carried out by external actors who are independent of the influence of parties, election administration, or vendors and can conduct professional analysis themselves. Certification results should be public and accessible to all interested parties.

It should be noted that there are no uniform global certification standards, and they will be written based on best practices by specific countries. Involving stakeholders in the development of certification requirements is another opportunity for the election administration to conduct an inclusive and open process.

PREPARATION OF THE LEGISLATIVE FRAMEWORK:

The introduction of electronic technologies in elections requires a change in the legislative framework, which goes beyond the mandate of the election administration. The main thing is that these legislative changes are in line with the technological choices that will be made by the election administration.

Significant attention to legislative changes should be given to the revaluation of the complaint handling mechanism and the refinement of legislative regulations where votes are needed. However, the list of legal issues is extensive, and the introduction of electronic technologies may necessitate changes in details such as data protection, certification, audit mechanisms, etc.

At best, a change in the legal framework should take place in parallel with the selection and certification of technologies, and this process should determine the needs of legal regulations and not the other way around. That is why a strong political consensus is important in the introduction of electoral technologies.

AUDIT:

Confidence in e-voting results can be strengthened through a variety of mechanisms. However, a strong lever in this regard is the mandatory audit of election results, which will confirm how well electronic technologies have counted votes. Within the framework of legislative changes, it should be specified on what principle the audit will be conducted. However, according to good practice, it should be carried out as soon as possible after the election at randomly selected polling stations and open to observers.

Time: As it turned out, the preparatory work for the e-elections requires a certain amount of time, so work on the project must start in time to allow enough time to select specific technology and supplier vendor; Strengthen the organizational and human resources of the election administration; complete legislative changes, test and certify procurement technologies, and most importantly, raise awareness among a wide range of voters. It is unrealistic to introduce electronic technologies across the country for the 2021 self-government elections - the remaining time only allows for pilot expansion. According to good practice, the transition to electronic technologies will require several choices as it is a long, cautious and inclusive process.[40]

INFORMATION CAMPAIGN:

A comprehensive information campaign is important. Residents need to know how to vote, how their votes will be counted and summarized. Voters need to know why their taxes are being spent on electoral technology. It is necessary to work with those negative groups that can potentially effectively sabotage e-elections. That is why the election administration should lead the voter information campaign and plan and carry out relevant activities together with professionals in the field.
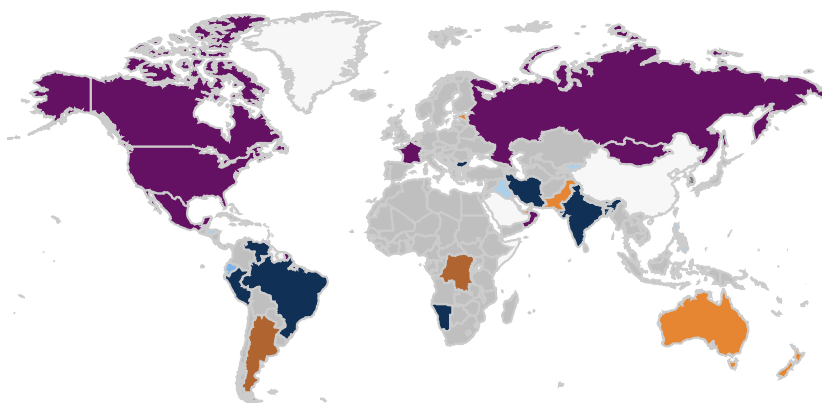
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40 Goldsmith Ben, Ruthrauff Holly. Implementing and Overseeing Electronic Voting and Counting Technologies. 2013: https://bit.ly/3w319dV

ANNEX

If e-voting is currently being used, what type(s) of technology used?

ICTs in Elections Database – E-voting

Direct recording electronic (DRE) voting machines with and without voter-verified paper audit trail (VVPAT)
Internet voting systems
Optical Mark Recognition (OMR) or Optical Character Recognition (OCR)
Electronic ballot printers (EBPs)
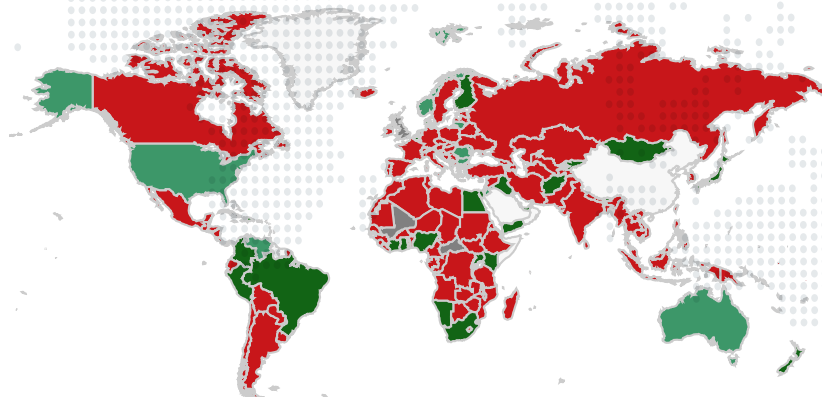**Not applicable**
No data
Multiple answers

Map 1: International IDEA

Is technology used for identifying voters at polling stations (electronic poll books)?

ICTs in Elections Database – Voter registration and identification

Yes, offline/only access to polling station registration data
Yes, online/connected to central voter register
No
No data

Map 2: International IDEA

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