One small step for e-voting, one giant leap for democracy

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Abstract

E-voting is the next step of the Republic of Moldova evolution. In the article we present advantages of e-voting, all steps of its using, many kinds. Electronic voting refers to election using electronic. E-voting can be managed by phones, Internet, private computer networks or special kiosks. We give reasons of accepting this kind of voting.

It is analyzed the OSCE/ODIHR's (Office for Democratic Institutions and Human Rights) activities which are related to tolerance and non-discrimination are focused on the following areas: legislation; law enforcement training; monitoring, reporting on, and following up on responses to hate-motivated crimes and incidents; as well as educational activities to promote tolerance, respect, and mutual understanding in the article.

It is given conclusions of all ODIHR activities which are carried out in close co-ordination and co-operation with OSCE participating States, OSCE institutions and field operations, as well as with other international organizations.

Keywords: *Electronic voting, tolerance and non-discrimination, ODIHR's (Office for Democratic Institutions and Human Rights), international organizations.*

Electronic voting (also known as e-voting or EVM) refers to voting using electronic means to either aid or take care of the chores of casting and counting votes.

The world is in the era of globalization. Information technology has greatly affected all aspects of life, and to a large scope, this includes politics. The idea behind developing an online voting system was to improve and speed up the process of traditional way of voting. The concept of e-voting should be embraced by the developing countries because of its advantages over the traditional manual voting system.

Voting is a method by which groups of people make decisions. These decisions could be political, social or public. Voting can also be used to choose between difficult plans of actions or to decide who is best eligible to be awarded a prize. Voting can thus be defined as a process that allows a group of individuals to choose

between a numbers of options. Most voting systems are based on the concept of majority rule or plurality. For example, in an election, a candidate with a plurality receives more votes than any other candidate, but does not necessarily receive the majority of the total votes cast. Elections allow the people to choose their representatives and express their preferences for how they will be governed.Naturally, the integrity of the election process is fundamental to the integrity of democracy itself. The election system must be sufficiently robust to withstand a variety of fraudulent behaviors and must be sufficiently transparent and comprehensible that voters and candidates can accept the results of an A voting system must be comprehensible to and usable by the entire voting population, regardless of age, infirmity, or disability. Providing accessibility to such a diverse population is an important engineering problem and one where, if other security is done well, electronic voting could be a great improvement over current paper systems.

We would like to emphasize that the Ministers' Deputies adopted at their 1289th meeting on 14 June a new Recommendation on Standards for E-Voting. The new recommendation CM/Rec (2017)5, which follows the previous Rec(2004)11, was developed to ensure that electronic voting complies with principles of democratic elections and is the only existing international standard on e-voting so far. The new recommendation deals with the most critical part of election technology, namely e-voting, which means the use of electronic means to cast and count the vote. This category includes systems such as Direct Recording Electronic (DRE) voting machines, ballot scanners, digital pens and internet voting systems. It aims to harmonise the implementation of the principles of democratic elections and referendums when using e-voting, thus building the trust and confidence of voters in their respective voting process and e-voting schemes.[1]

The public thirst for rapid and objective results has developing led countries to adopt new technology in the electoral process. Automation is often a complicated process, especially in countries with limited infrastructure. Technology, impacts all aspects of elections, including those that seem immune, but eventually may lead to unintended con-sequences. It is obvious that manual way of conducting election could be difficult to determine transparency in an election process. We carefully identified the following problem associated with the election processes as: the absence of an online registration system where people of voting age can simply logon and register at any time and place convenient to them. There is also problem of conveying election result from a pooling unit to the collation center, where the election officials maybe attacked. Paper balloting may be damaged as a result of rain fall or other external interference.

People sometimes are unwilling to participate on election because of the system of election. Traditional system requires people to stand in line for hours to get the chance to vote, while they also have a lot of routine activities to do.[2] Online voting, on the other hand gives a large opportunity to vote from any point where Internet access is available such as home, school, office or even shopping mall. Using online voting can reduce the time people need to vote. This means that citizens can vote without waste of time and to avoid long queue of voters which were identified

as the biggest problem of every election. Citizens can vote without going to the polls and may be this is the efficient way to encourage people's participation on Election Day. In other countries democracy is celebrated, like the United States and Britain, election time is a period of looking forward to change, a new hope for better leadership.

The introduction of the electronic voting has eased the way voting is conducted. The term e-voting is used for the variety of different ways of voting where the voter's intention is expressed and collected using the electronic methods. These technology have reduced quite lot of time in conducting the elections and announcing the results. These technologies have also reduced the manpower that used to be spent on the traditional voting system. Electronic voting, also known as e-voting, is simply voting electronically by deploying biometrics to achieve accuracy.

Electronic voting technology can speed the counting of ballots, reduce the cost of paying staff to count votes manually and can provide improved accessibility for disabled voters. However, there has been contention, especially in the United States, that electronic voting, especially DRE voting, could facilitate electoral fraud and may not be fully auditable. In addition, electronic voting has been criticized as unnecessary and expensive to introduce. While countries like India continue to use electronic voting, several countries have cancelled e-voting systems or decided against a large-scale rollout, notably the Netherlands, Germany and the United Kingdom due to issues in reliability of e-voting.

Electronic voting systems for electorates have been in USA since the 1960s when punched card systems debuted. Their first widespread use was in the USA where 7 counties switched to this method for the 1964 presidential election. The never optical scan voting systems allow a computer to count a voter's mark on a ballot. DRE (a direct-recording electronic voting machines) which collect and tabulate votes in a single machine, are used by all voters in all elections in Brazil and India, and also on a large scale in Venezuela and the United States. They have been used on a large scale in the Netherlands but have been decommissioned after public concerns.

Internet voting systems have gained popularity and have been used for government elections and referendums in Estonia and Switzerland as well as municipal elections in Canada and party primary elections in the United States and France.

There are also hybrid systems that include an electronic ballot marking device (usually a touch screen system similar to a DRE) or other assistive technology to print a voter verified paper audit trail, then were used a separate machine for electronic tabulation.

Cambridge Dictionary gives the next definition for the word PROGRESS: movement to an improved or more developed state, or to a forward position.[3] In the very beginning there was nothing, from that time on a lot of things have changed. Somebody calls it evolution, somebody calls it a progress. In ancient times people lived in caves, it was cold and wet, but they adapted. Later they build houses, citadels and even cities. At the beginning it was scary because people are always scared by things they don't know. We are sure there were saying: it's dangerous outside, it will be better if we remain here in caves. Although they were doing

everything to stop progress, civilization has never remained on the same level. As a matter of fact there will always be people who will try to stop any beginnings and who will remain in history, because they helped our civilization to develop. But the places where we have lived have changed, rulers have changed and ways of leading have changed during history. The leading system in most developed countries is democracy. Although the most of aspects in democracy have changed, some remain the same which were many years ago. Such a thing is voting. During many years people used to lose a lot of time to vote, staying in crowds for many hours to throw a piece of paper in a basket. History is repeating, there are two kinds of people nowadays. People who says that everything is perfect and we should remain at the same level, because that's what they are used to, and those who want to make our life easier by bringing progress. We believe that e-voting is the next step in developing democracy. E-voting is a voting using electronic means to either aid or take care of the chores of casting and counting votes.

In 1856, The Australian state of Victoria becomes the first place to use uniform official ballots. This style of paper ballot, lists the names of all candidates and issues in a fixed order, and is counted by hand. [4] Concern about vote fraud and voter privacy was not restricted to England and the United States. One of the most important innovations in voting technology came about in Australia. In 1858, an election was held in the state of Victoria using standardized paper ballots that listed all candidates for office. These ballots were printed at government expense and distributed to the voters at the polling place, one per voter. This system, while obvious in retrospect, was sufficiently innovative that it came to be known as the Australian secret ballot.

We consider today, the Australian ballot seems so natural that we take it for granted as ancient technology, and in much of the world, it is so firmly entrenched that replacing it with mechanical or electronic voting machines is unthinkable. Nonetheless, the benefits of the Australian ballot were not obvious at the time it was introduced. Use of this technology requires, after all, a special print run at government expense, plus the cost of secure ballot storage and transport.

Faculty from the California Institute of Technology and the Massachusetts Institute of Technology create the Voting Technology Project in the wake of the 2000 election to provide "strong academic guidance in this intersection of technology with democracy." They offer several recommendations to improve election administration for the future in their July, 2001 report (What Is and What Could Be). [5] In May, 2002, The FEC releases an updated version of the standards for electronic voting systems. In July 2004, Nevada becomes the first state to mandate that all electronic voting machines used for federal elections be equipped with printers that produce a voter-verified paper audit trail. [6]

The general online voting system has been divided into six phases. These are:

- Registration
- Authentication
- Voting and saving the votes
- Managing the votes
- Counting the votes
- Auditing

We are agree that E- voting systems have many advantages and disadvantages:

Increase Turnout: One of the biggest advantages of using online voting system is that it could increase the voter turnout. The percentage of the UK population that has home internet access has increased rapidly from 35% in 1950 to 70% in 2009.

- **Convenience:** Online voting system will provide citizens the comfort of voting from their own place at their own time. This will also help citizens who are abroad and using special mail ballot to send their vote. Also the people who are out of the country for the military services can be advantaged by this project.
- **Appeal to Young Voters:** Online voting would appeal young voters to vote. The voter turnout among young people is particularly low. The Canadian survey shows that 64% of the young voters who did not vote would prefer to vote online.
- **Reduce the Expenses:** The online voting system will help reduce the expenses involved in the setting up the polling sites and saves money in printing and mailing the paper ballot. It will also reduce the expenses on the manpower. More information on the candidates: Online voting system will allow more information to be displayed about the candidates and their policies.
- **Comprehensive Reporting:** Online voting system will instantly provide the informative day-by-day statistics about the elections beyond just who has won. Save paper: Online voting will also help saving tons of paper. So it contributes towards the environment saving.

Issues with Online Voting: There are different issues that need to be considered before developing online e-voting system. The main issue is security. There are other aspects besides security. Some of them are forcibility; vote selling, vote solicitation, registration etc.

Malicious Payload: There are so many programs available that can threat the concept of online voting. The hacker only needs to visits the website of any number of security vendors. Once the malicious payload reaches the host or voting platform, it can cause lot of harm that no one can imagine. This program can change the voter's vote without anyone knowing it regardless of any kind of encryption or voter authentication in place. The main threat with this program is that it can manipulate the votes before the authentication is applied and it erases itself after causing the damage so that there is no evidence of the voting manipulation and fraud.

- **Selling of the Votes:** This issue is the matter of concern and it is nearly impossible to stop until people realize what difference a single vote can make. It is has been happening in the past, people sell their votes for the money. It doesn't matter how secure the system; it cannot do anything if the person sells his online voting details to someone.
- **Fraud:** This issue comprise to registration part and the voting part. The voter can register more than once online as there is none to see and can vote more than once. There is no point of having election if the voter votes more than once using forge identity.

- Further works need to be done in designing and incorporating extra protocols into the existing for elections where voters need to vote for multiple candidates at various levels of the government (for example a voter needs to vote for candidate X for presidency, Y for senate and Z for governor of a state etc.) at a go without having to vote individually for every candidate at separate times. The day is not far when e-voting will be the norm and people can exercise their franchise via the internet from own house rather than going voting zone without any corruption. But voters must have a substantive reason for trusting that their intentions have been correctly interpreted and recorded, and that their votes have been counted correctly. Future intention regarding electronic voting should be improve our capability and increase our knowledge in all the areas of cyber security.[7] The new technology should be improved in such way – that anyone can ensure that the intent of the voters is reflected in the official tally of the vote, that they are credible when margins of victory may be as small as a fraction of a percent. Thus the future electronic voting environment would satisfy the needs of voters and election officials, thus new rules and reliable, trustworthy voting systems would win over voters and would be known as the solution that overcome the constraints and save the democracy. [8]
- We want to present comparison of e-voting between Estonia, Germany and the USA.

Electronic voting in Estonia began in October 2005 local elections when this country became the first to have legally binding general elections using the Internet as a means of casting the vote and was declared a success by the Estonian election officials. From 2005 till 2014 we can see progressive growing the number of participants in elections. But in the 2014 European Parliament elections only 31.3% of all participating voters gave their vote over the Internet. [9]

Germany piloted its first electronic voting machines, supplied by the Dutch company NEDAP, in Cologne in 1998. The trial was seen as successful, and one year later Cologne used electronic voting machines for its entire European Parliament elections. Soon other cities followed suit, and by the 2005 general election nearly 2 million German voters were using these NEDAP machines to cast votes. Reaction to the use of these electronic voting machines was generally very positive among voters, who found the machines to be easy to use, and among election administrators, who were able to reduce the number of polling stations and staff in each polling station. [10]

Electronic voting also known as e-voting is the type of vote were the election data is stored, recorded and primarily processed as digital information. This electronic vote systems have been used since 1960. E- voting in USA was first used in 1964 when 7 counties had change to this method for the presidential election. E voting refers to computerized vote machines which uses for voting electronic ballots instead of paper ballots. Nowadays electronic voting is also used in other countries like: Brazil, Norway, Germany, Venezuela, India, Canada, Belgium, Romania, Australia, UK, Italy, Ireland, European Union and France.

As about the Republic of Moldova we would like to give our point of view. The Republic of Moldova is a parliamentary republic. Executive powers are exercised by

the government headed by a prime minister and legislative power is vested in the parliament. The president serves as the head of the state and holds certain limited authority, including on foreign policy and national defence.

As described the Right to Vote is one of the fundamental human rights as provided by the Universal Declaration of Human Rights, relevant international and European human rights treaties, including the International Covenant on Civil and Political Rights, the International Covenant on Economic, Social and Cultural Rights, and the European Convention for Human Rights. The introduction of Internet Voting shall provide for additional opportunities for men and women, in particular for those with mobility disabilities; for citizens residing abroad who are willing to vote, but don't have the possibility because the overseas polling stations are far away from them; for internal migrants, including students; as well as for the Moldovan citizens who are residing in the Transdniestrian region.

Recently, the E-Governance Center of the Republic of Moldova, the national coordination authority of open data and online public services, have initiated the process of public consultations on a new Action Plan on Open Government for the years 2016-2018.[11] Thus, as the implementation of open governance principles shall not be limited to the Governmental bodies, it is recommended that relevant actions for the preparation, piloting and introduction of Internet Voting in Moldova should be introduced in the respective Action Plan. This will contribute to the synergy of actions of the Central Electoral Commission and Governmental authorities in the implementation of the piloting of Internet Voting by the regular 2018 national Parliamentary Elections.

According to the official data presented by the report of Gramatic Social Media in February 2018, 70% of the households in Moldova do have access to the Internet, 72% of users access the Internet at least once a day.[12] The penetration rate for the Internet service – (land ADSL, fiber) is 14,7% (over 525.000 households). At the same time, according to the report of the National Regulatory Agency for Electronic Communication and Information Technology the mobile telephone penetration rate is 121,8% (over 4,3 mln. users), while mobile data penetration rate is over 8,5% (with over 298,400 users).

We present data according to www.Internetlivestats.com there are 1,946.000 Internet users in Moldova, which represent over 50% of the population of the Republic of Moldova.[14]

And according to the information provided by the E-Government Center, during the inception mission interviews, there are currently over 90.000 users of electronic signatures per year in Moldova, including over 55.000 users of Mobile signatures (SIM) [15], over 35.000 users of E-key (in particular legal persons and civil servants), over 200 users of E-ID cards.

The Republic of Moldova has a high penetration rate of internet and very good mobile coverage. Internet is accessible almost everywhere in the country. Mobile phones and computers can be found in the majority of households, being very popular among individuals.

Parliamentary political parties expressed a general support for the introduction of the Internet Voting in the Republic of Moldova. The main motivation

that was mentioned in this regard was the creation of alternative voting solutions for the Moldovans living abroad, the young electorate (the participation rate of the youth in the previous Parliamentary Elections was less than 5%) and for those who usually do not vote in elections due to other agendas during the Sunday Election-Day. However, the majority of the political parties where rather reserved to predict the introduction of the Internet Voting in the Republic of Moldova in the next 2-4 years. At the same time, all representatives of the political parties have expressed support for the piloting of the Internet Voting during the next ordinary Parliamentary Elections. Some also indicated that a preliminary piloting phase could be considered as well for the Elections of the President scheduled for 30 October 2016. A special attention shall be dedicated to the testing and piloting phases. Visibility and popularization of the Internet Voting was also mentioned as being important.

The Republic of Moldova has all the basic preconditions for introducing Internet Voting in the near future:

1. Well- developed Internet infrastructure;
2. High degree of mobile network coverage;
3. Good degree of public ICT literacy;
4. Reliable voters list (SRV);
5. All polling stations are equipped with Internet – connected computers, and they are constantly online and communicating with SAISE.

Despite the fact that the absolute number of bearers of digital certificates for personal identification are still low, popularity of Mobile-ID is rising rapidly, and it is expected to continue to grow as more e-services will be offered by the government.

Thus, the authors of this Study present two main propositions:

- To create an official Internet Voting Information System (IVIS);
- To implement the IVIS Pilot version before the general Parliamentary Elections in 2018.

The Electoral Code of the Republic of Moldova does not include specific provisions regulating Internet Voting concepts, policies, rules, procedures, and relevant functioning and the management requirements for the Internet Voting Informational System. In order to create a proper legal framework for the implementation of the Internet Voting, the Electoral Code is to be modified by introducing Internet Voting concepts, vote verification and cancellation rules, voting secrecy assurance principles, voter identification aspects, information systems establishing the framework for its functional, security and audit requirements and other elements common to the Internet Voting. A new title on Internet Voting shall be introduced in the Electoral Code. The Central Electoral Commission could also consider, if deems necessary, to establish a separate Internet Voting Electoral Council (IVEC). Prior to the adoption of the amendments to the Electoral Code introducing specific Internet Voting legislation the opinions of the Venice Commission and OSCE/ODIHR shall be consulted.

We have carefully examined electronic voting system as well as the pilot experiences of many countries. All these suggests that both the extremely optimistic and pessimistic positions about the effects of voting systems are overstated. We

have also discussed the security requirements of electronic voting and highlighted the contradiction in some of these requirements. We presented information about limitations and suggested further works that should be done to address them. However, practical testing and pilot projects are the only ways of knowing what will work and what will not. Trials of particular methods will give the best insight into understanding what requirements must been met for modern voting to work well as well as the actual pros and cons of electoral systems. The modern electronic voting will not act as a panacea for the social causes responsible for electoral disengagement, nor will it remedy negative attitudes toward political entities. It will, however, increase voting opportunities for electors and make casting a vote more accessible. On the other side, electronic voting will not erode democracy or result in vote buying and election fraud any more than does the existing system.

The world is in the era of globalization. Information technology has greatly affected all aspects of life, and to a large scope, this includes politics. We hereby stress the fact that, the importance and necessity of electronic online voting system cannot be overemphasized. There is no doubt that the new voting protocol became not only simpler with higher security level, it also offers a better integration of the general public irrespective of their locations. All this brings us one step closer to feasible electronic voting system for elections in the range of operational political elections. Necessary and adequate research materials should be made available by the government in the institutions of higher learning so as to ease and assist wider and broader researches in the field of Computer Science and Information Technology. The process of voter registration/re-validation should be made online. This is with a view of eliminating registration fraud and other electoral malpractices. It is also worth mentioning that, mobility difficulties will be eliminated.

References

[1] Bonetti, P., Ravaioli,S., Piergallini,S. 34(2000), *The Italian academic community's electronic voting system, Computer Networks*, pp. 851-860.

[2] Caltech/MIT (2001), *Voting Technology Project Voting: What Is and What Could Be*, July 2001.

[3] Dean A. Heller (2004), *Certification of Voter Verified Paper Audit Trail Printer Completed*, www.sos.state.nv.us, July 16, 2004.

[4] EV - Electronic Voting (2013), *An Electronic Voting Scheme using the Secure Payment card System Voke Augoye Technical Report RHUL–MA*–2013– 10 01 May 2013.

[5] http://en.anrceti.md/Internet_mobil_BL#fig5 (available from 21.10.2018)

[6] http://www.egov.md/ro/communication/news/vino-cu-propuneri-la-planul-de-actiuni-pentru-o-guvernare-deschisa (available from 12.10.2018)

[7] http://www.Internetlivestats.com/Internet-users/moldova/(available from 22.10.2018)

[8] https://dictionary.cambridge.org/ 9 (available from10.10. 2018)

[9] https://www.coe.int/en/web/cm/news/-/asset_publisher/hwwluK1RCEJo/content/council-of-europe-adopts-new-recommendation-on-standards-for-e-voting/16695?inheritRedirect=false (available from3.10. 2018)

[10] https://www.ndi.org/e-voting-guide/examples/constitutionality-of-electronic-voting-germany (available from 22.10. 2018)
[11] https://www.publika.md/peste-900-de-mii-de-moldoveni-au-conturi-pe-facebook-cati-dintre-ei-mai-folosesc-odnoklassniki_2995222.html(available from 09.09.2018)
[12] Lewis M. Branscomb (2007) *Elections and the Future of E-Voting* (editorial).
[13] Mary Bellis (1889), *The History of Voting Machines, inventors.about.com*, Nov. 13, 2000.
[14] Moldcell (one of the 3 mobile operators) reported over 21.000 users of M-signatures.
[15] Statistics about Internet Voting in Estonia. Estonian National Electoral Committee. November 20, 2014.