# ELECTRONIC VOTING: TO HAVE, OR NOT TO HAVE?

***Matej Travnícek, PhD***
Department of Political Science, Faculty of Social Sciences, Charles University in Prague, Czech Republic

**Abstract**

This article focuses on various factors related to electronic voting. The analysis therefore concerns formal requirements for electoral process, counting speed, number of invalid votes, counting errors, trust and electoral frauds, accessibility of the elections and turnout. In the finale the impact of e-voting is summarized and recommendation is delivered. The findings indicate that electronic voting can solve some problems in electoral design, but as well can deepen the existing ones and even create a new ones. It is therefore important to discuss it in context of respective electoral design, because there is no universal answer to the question contained in the name of the article.

**Keywords:** E-voting, elections, electronic voting, implementation framework

## Introduction

There were never in human history possible to transfer information in such amounts, at such distances and in such time. The digital revolution conquered our world and started changing it. New possibilities of spreading information opened many doors and even more questions in many scientific fields.

Paraphrasing Shakespeare's Hamlet, to have, or not to have, that is the question of this article. The aim is to provide a comprehensive analysis whether to implement or whether not to implement electronic voting in elections.[17] The perspective will be primarily from the point of view of political science. However some overlaps mainly into informatics and law will be present. As a result there will be a methodological framework, a tool suitable for use in any country to evaluate the possible implementation of electronic voting and to measure its supposed impacts. The focus will be therefore laid on both advantages as well as on disadvantages.

First of all I will briefly introduce the definition of the terms, thereafter I will lay down the various aspects, which are need to take in mind, when considering the implementation of the e-voting. After that I will summarize it into methodological framework and close the papers by the conclusions and recommendation.

## Definition

First of all, in order to discuss electronic voting, or e-voting, we need to define what it is? We could simply say that electronic voting is every voting which uses any electronic devices or techniques at any stage of electoral process. However, this definition would be too wide, because it will cover practically all types of voting, since counting the overall results from the fractional results is somehow computerized. Such a definition would not be therefore useful. So we have to look for some better.

[17] In this text I am using the terms "electronic voting" and "e-voting" as mutually interchangeable.

| **Table 1 – Basic division of electronic voting** | |
|---|---|
| **Type** | **Technique** |
| Voting in supervised environment (Voting at polling station) | DRE[18] |
| | Optic scanner[19] |
| Voting in unsupervised environment (Remote electronic voting) | Internet |
| | Digital television |
| | SMS |
| | Telephone |

Council of Europe defines e-voting as "an election or referendum that involves the use of electronic means in at least the casting of the vote" (Council of Europe 2009, 16). I find this definition the most suitable for our needs in this article. However, it is quite predictable, that we will need more effort to distinguish different types of e-voting. There are plenty of definitions (see Council of Europe 2005, Kersting and Baldersheim (eds.) 2004, Alvarez a Hall 2004, Reterová 2008, Enguehard a Graton 2008), however for the purpose of this article we will content ourselves with basic division concerning the question, wheter the environment is or is not supervised. This means, whether or whether not the electoral officials have, or should have, full control on the electoral process. This division is contained in table no. 1.[20] It is quite a simplification, but for the purpose of this analysis is such a simplification sufficient without loosing any information relevant to the analysis.

## Analysis

### Formal demands of electoral process

The electoral law puts in a various countries various demands towards the process of the elections. For instance the voter registration, is it automatic or on request? What are the requirements for running in the elections? Etc. This legal framework has many aspects, but at this place we will focus on three of the fundamental legal aspect of free and democratic elections, which are challenged by the e-voting.

First of all, there is a question of maintaining the ballot secret. On one hand, there is a problem connected with family voting, which means that the vote is cast under pressure of close relatives. Thus it is not being the expression of free will of the voter (Enguehard and Graton 2008, 8) and on the other hand there is a problem with the security of the electronic envelope, in which is the vote cast electronically. Thus the guarantee of the secret ballot is highly questionable.

Secondly there is a problem in digital divide (Norris 2001), which means that not all the voters are skilled enough to participate in the e-voting process. This means that replacing the paper ballots by some kind of e-voting would, or should, make the elections inaccessible for some voters, the ones, who are not able or willing to participate via the electronic way. Thus the suffrage should be viewed as not universal and therefore unconstitutional in many countries. With this is closely connected the argument of saving money through using e-voting. This argument is fragile, since it is necessary to implement e-voting as a technique complementary to the paper ballots. So in a short term the e-voting will require additional

[18] Direct-recording electronic voting system. In this paper I will understand under this term kiosk voting as well as voting terminals and intranet poll site voting.

[19] Votes are cast via a ballot in the polling station, the computerization is in fact, that the votes are scanned and counted by a computer.

[20] To be complex, we can as well define remote non-electronic voting, which will be the category for postal voting and similar techniques, or we can say, that paper ballot cast in the polling station is an example of non-remote and non-electronic voting, or the non-electronic voting in the supervised environment respectively.

money from public budgets. Some kind of saving is imaginable only in long term and hand to hand with reducing number of polling stations or leaving the paper ballot at all.
And finally, the principle of free elections requires that the votes are counted authentically, which means that there is an option for verification through recalculation for the purpose of judicial review. Some electronic techniques did not allow this recalculation, because the vote does not exist in a physical form.[21]

These are three main legal obstacles for e-voting implementation and as well the three main legal threats, which should be considered by legislators, who are thinking about to implement e-voting in their countries. This thread is not illusory, but real, the e-voting in all of its forms were abolished in several countries, for instance in 2004 in Ireland (Smith 2009, 7), the Netherlands in 2007 (Loeber 2008), Paraguay in 2008 and Germany in 2009 (Barratt i Esteve, Goldsmith and Turner 2012). It is important to understand that every cancellation of e-voting goes hand to hand with a wasting quite significant amount of taxpayer money.

**Counting speed**

It is important to have real electoral results as soon as possible. Any delay of delivering the final count should foster instability and even some sorts of public unrest. Long counting time should also hurt the credibility of the elections. It is undisputable, that e-voting in all of its forms greatly increase the counting speed of the elections. The result should be recorded de facto instantly.

Brilliant example of successfully reducing the time needed for counting the votes is Brazil, where implementation of DRE shortened it from approximately one month to 30 hours "only" (Reterová 2007, 219). However this can be applied only on electronically casted votes, so the speed increase depends on amount of votes casted this way, because for paper ballots there will be still necessity to count them manually.

**Number of invalid votes**

E-voting, in case that it is properly programmed, can as well eliminate any invalid votes, simply by not allowing voter to cast such a vote, or by permitting voter to cast invalid vote only after explicit confirmation.

It is important to look for the roots of the high numbers of invalid votes. (1) They can be cast as a sign of protest or (2) by an accident. In such case, the blame should go to low level of literacy, or basically to low level of election procedure awareness, or to the fact that electoral procedure is way too complicated. (3) And last but not least, the electoral law regarding the validity of the vote under the examination. The reasons for each country may differ, and detailed identification of the reasons for each country is not purpose of this paper.
However, if we take a short look on the data[22] about percentage of invalid votes casted in the last parliamentary elections, we will see that there are totally 77 territories with percentage of invalid votes above 2 % out from the 160 territories monitored in the dataset. Regarding direct presidential elections instead of the parliamentary, we will get the number 61 out of 103. The high score is in parliamentary elections 19 % for Morocco in 2007, 15.6 % for Mauritania in 2006, 14.4 % for Algeria in 2007, 14.38 % for Indonesia in 2009, 11.45 % for Honduras in 2009, 11.25 % for Mozambique in 2009 and 10.58 % for Angola in 2008. The rest are under 10 %. In presidential elections is the score: 13.52 % for Comoros in 2010, 13.09 % for Angola in 1992, 11.9 % for Philippines in 2004 and 10.8 % for Yemen in 2006. Again, the rest are under 10 %.

[21] This problem does not concern the optical scanners and some types of DRE, but it is inherent to all sorts of remote electronic voting.
[22] Accessible at the website of Institute for Democracy and Electoral Assistance, www.idea.int.

Among these countries are as well some of the developed countries, as it can be observed in table no. 2. For the countries with high share of invalid votes should be implementation of e-voting one of the solution of this problem. However closer examination of the reasons, why there are so many invalid votes, should be on the first place.

| **Table 2 – % of invalid votes in developed countries**[23] | | |
|---|---|---|
| **Country** | **Parliamentary elections** | **Presidential elections** |
| Chile | 8.92 (2009) | 3.39 (2010) |
| Luxembourg | 6.45 (2009) | - |
| San Marino | 6.43 (2012) | - |
| Belgium | 5.8 (2010) | - |
| Australia | 5.6 (2010) | - |
| Lithuania | 5.48 (2012) | 1.27 (2009) |
| Poland | 4.52 (2011) | 1.16 (2010) |
| Andorra | 4.24 (2011) | - |
| Portugal | 4.08 (2011) | 5.07 (2011) |
| Palau | 4 (2008) | - |
| Italy | 3.59 (2013) | - |
| Liechtenstein | 2.9 (2009) | - |
| Costa Rica | 2.6 (2010) | 2 (2010) |
| Saint Lucia | 2.52 (2011) | - |
| France | 2.14 (2012) | 4.68 (2012) |
| Cyprus | 2.08 (2011) | 3.31 (2013) |
| Nauru | 2.03 (2010) | - |
| *Source: www.idea.int, ranked and selected by the author* | | |

**Counting errors**

Research made by Ansolabehere and Reeves shows that there is approximately 1 % error in counting votes manually (Ansolabehere and Reeves 2004). This research was made however on the results of First-past-the-post electoral system in New Hampshire from 1946 to 2002, so it is likely to assume that under conditions of more complicated, or perhaps sophisticated, electoral systems[24] the results would exhibit larger share of errors.

E-voting can for sure lower the percentage of miscounted votes. But again it depends on amount of electronically casted votes. It can be said in general that impact of e-voting implementation is greater in more complex electoral designs.

**Trust and electoral frauds**

In any case, when e-voting is considered, it is necessary for its successful functioning, some level of public trust. Without this, at least elementary, confidence, e-voting can strongly damage the legitimacy of the elections.

Thus it is better to implement e-voting in countries, where there is strong public confidence towards government and generally towards electronic tools in the lives of citizens. One of the weak points, or perhaps the weakest one, of e-voting is problem with electoral frauds. When there is no ability to recount the votes and as well no option for voters to check, whether he or she really casted the vote for a party or candidate he or she intended to vote,[25]

[23] With score 1, so the best, in Freedom House index.

[24] The First-past-the-post electoral system is simple regarding to examine the election results.

[25] This critique is not valid in case of optical scanners.

it is easier to conduct electoral frauds. So the manipulation of the results by the government or the officials is easy under e-voting.

Similar problem is with the voting in unsupervised environment. (1) There is risk with so called "family voting" (Krimmer and Volkamer 2005, 226) and other kinds of voting under some sort of pressure, so non-free voting is more likely, when votes are cast in unsupervised environment. (2) Also voting in unsupervised environment simplifies the situation for the ones, who are buying the votes, bribing the voters respectively.
Any sorts of e-voting, and the ones used in unsupervised environment, should be therefore implemented rather in territories with low level of risk of electoral frauds.

**Accessibility of the elections**

Another aspect of the election is its accessibility. It means as well the accessibility of the polling stations for the electors. This is mostly the problem for the voters abroad and for the voter swith some kind of disability (especially for the sightless and with similar disability, in general the voters with special needs).[26]
E-Voting, which can contain voice assistance, is therefore a good option to solve the problems in countries with plenty of voters living abroad and as a technique to make voting easier for people with disability.

**Turnout**

Last but not the least factor I would like to focus is turnout. First of all, is good to point out, that there is in political science on one hand approach, which considers the turnout to be a "brilliant indicator of quality of democracy" (Lijphart 1994, 4). On the other hand, is being pointed out that it is important to examine the reasons of non-participation in the elections and that one of the reasons can be satisfaction with current state (Novák 1998, 133). Important is as well the context of the elections. For voter, the non-participation can simply be the best strategic option, for instance in cases, where he or she has no opinion which party to vote, or in case, when he or she is satisfied with every likely scenario of the outcome. It cannot be said therefore, that high or low turnout, without examining the reasons, is a good indicator of quality of corresponding democracy (Lipset 1981).

In the light of results from Estonia, which was one of the pioneers of e-voting, it is quite unimportant at which position we stand in a dispute, which is sketched above. Because the data from the research made by Trechsel and Vassil shows, that possible contribution to the turnout via use of e-voting[27] is from 0.3 % in local elections in 2005 to 3.5 % in parliamentary elections in 2011 (Trechsel and Vassil 2011).

My role here is not to judge whether these numbers are high or law. Such a judgment is subjective. So I will be content to say, that the e-voting, in its remote form leads to an increase in turnout, however it would be naïve to expect an increase in tens of percent.

**Conclusion and recommendations**

All the described factors are summarized in SWOT analysis in table 3. It is quite obvious on first look, that e-voting has several strengths and as well several weaknesses, there are also some opportunities and, however, plenty of threats.

As it was shown above, the electronic voting has the ability to solve some problems connected to electoral process and as well the ability to make some problems even bigger.

Therefore I strongly recommend to think about it only as one of many electoral

[26] Just this reason, to enable voting to sightless and similarly disabled, was the reason to implement system of iVote in New South Wales, Australia, where it is possible to cast votes via internet and telephone since the elections in 2011.
[27] In case of Estonia voting through the internet.

techniques[28] and to begin the discussion whether to implement or not to implement e-voting with description of current state of the facts. When the problems and weaknesses of respective electoral designs are known, the discussion if the solution can be to implement some sort of e-voting can start.

**Table 3 – SWOT analysis of e-voting**

| **STRENGTHS** | **WEAKNESSES** |
|---|---|
| Decrease of:<br>• number of invalid votes<br>• errors in counting<br>Increase of:<br>• accessibility of the voting (especially for voter with special needs)<br>• counting speed | Disputable law and constitutional conformity<br>Cost of implementation and maintaining<br>Electoral frauds are easier to conduct |
| **OPPORTUNITIES** | **THREATS** |
| Increase in turnout*<br>Saving the expenditure for voting organization (in long-term) | System failure caused by the hacker attack or by electoral official:<br>• manipulation with the outcome<br>• decommissioning system from operation<br>Threats to the legitimacy of the election<br>Failure to use the system because of low public confidence |

** not applicable for the systems used in the supervised environment (DRE and optical scanners)*
*Source: Author*

The answer to the question to have it or not have it, is not scientific, but purely political one. The lawmakers have to consider the cost and possible benefits and thereafter they have to decide.

It can be said in general, that e-voting can be a viable option for territories with high level of confidence into government and officials, with high data network penetration throughout the population[29] and with problems with slow speed of counting and low accessibility of the elections and for the ones, which are facing a very low turnouts.

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[28] Alongside with e. g. postal voting or advance voting.
[29] Internet, telephone, SMS, digital television.

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