Preliminary communication

Sociopolitical Aspects of Electronic Voting

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Summary

There are a number of countries throughout the world that implemented some type of electronic voting in the past three decades. In this paper we are examining the experiences from these countries based on the conducted social researches and the political effects that electronic voting brought. From the social point of view it is evident that voters are not so excited to switch from traditional, sociocentric voting to faceless electronic voting. Looking from the political point of view, arguments that another voting channel will increase political participation do not hold so strong against the numbers from elections where electronic voting was one of the options. Nevertheless, with the growing infiltration of information and communication technologies in our society, it is almost certain that all countries, including Bosnia and Herzegovina and countries from the Balkans region, will implement some kind of electronic voting in near future. That's why we are trying to give several directions how to implement electronic voting as painless as possible in this paper.

Key words: electronic voting, elections, remote voting, sociopolitical aspect

Introduction

In the past fifteen years we witnessed exponential growth of internet use. Information and communication technologies (ICT) became an integral part of our lives. Ordinary citizens, companies, non-governmental organizations and governments use internet and computers more and more for their daily operations. We are using internet for e-banking, e-shopping, we can apply for some documents and find endless amount of information there.

Simultaneously with the development of ICT, modern technologies find its role in political life. Political parties and candidates are running their campaigns on internet, doing fundraising, lobbying, collecting signatures for the petitions and recruiting new members. The power of internet to improve communication and access to information suggests its increasingly important relationship with the electoral politics. ICT will likely continue to have a significant impact on the nature of democracy in countries worldwide. One of the development directions is usage of modern technologies in electoral processes.

In last 30 years many countries throughout the world experimented with the different types of electronic voting with more or less success. While electronic voting promises significant improvements compared to traditional voting, there are certain risks associated with it. Most of these risks are related to public confidence in the security of the voting process and social nature of elections.
All risks and benefits should be carefully analyzed prior to any attempt of electronic voting implementation in one jurisdiction. We are going to present some experiences and research results from the countries that tested or fully implemented electronic voting. These results help us derive some recommendations how to painlessly implement electronic voting in countries like Bosnia and Herzegovina which neither tested nor politically discussed electronic voting of any form so far.
In this paper we are focusing on sociopolitical aspects of electronic voting, but there are other aspects that need to be considered as we are going to see later.

Definition of Electronic Voting

From the first use of now widely accepted 'Australian ballot' in mid 19th century, people were thinking how to use machines to improve electoral procedures. America was a leader, introducing mechanical lever machines, punched cards for voting and optical scanners.[1] First use of electronic machines in real elections goes back to 1970s in America. Since then, many electronic voting system prototypes have been deployed all over the world.
Today, when we say electronic voting (e-voting, eVoting), we assume use of some electronic means in some or all voting procedures. We can distinguish two main types of e-voting:

- Direct recording electronic (DRE) voting machines; and
- Internet voting.

DREs are machines (computers) located at the polling stations, where voters can cast their votes using the touchscreen or some type of simplified keyboard. Depending on the legislation, vote counting is carried out almost instantly at the polling station after the polls close, or the electronic ballots are transferred on memory modules to the central location where counting should take place.
Internet voting utilizes the public communication infrastructure for the procedures of voter's authentication and authorization, ballot casting and verification. Internet voting systems can be grouped into three general categories (Oostveen, 2007):

- **Poll site** internet voting refers to the casting of ballots at the public sites where election officials control the voting platform;
- **Kiosk** voting located in the convenient public places like community centers, libraries, post-offices, train stations or schools; and

[1] A Brief Illustrated History of Voting, The University Of Iowa Department Of Computer Science, http://www.cs.uiowa.edu/~jones/voting/pictures/

- **Remote** internet voting refers to the casting of ballots from any computer connected to the internet from anywhere in the world.

The author of this paper has strong attitude against any investment in the research and development of DREs in countries without legacy systems of that type. With the exponential growth of internet use, spending money and time on voting machines would be the waste of valuable resources. Online remote voting should be considered an essential convenience in modern society (Madise and Martens, 2006 in Goodman et al., 2010). That's why in this paper we are focusing on the internet voting, namely remote internet voting.

Aspects of Electronic Voting

Voting is the fundamental cornerstone of modern democracy which cannot be conceived without elections. It is the main mechanism to disclose the opinion of a group (of voters) about an issue that is under consideration. Since elections are so delicate and important in modern democratic countries, voting procedures have to be carefully examined in all belonging aspects. Same holds for the electronic voting. There is an ample of aspects that need to be considered:

- technical,
- legal,
- political, and
- social.

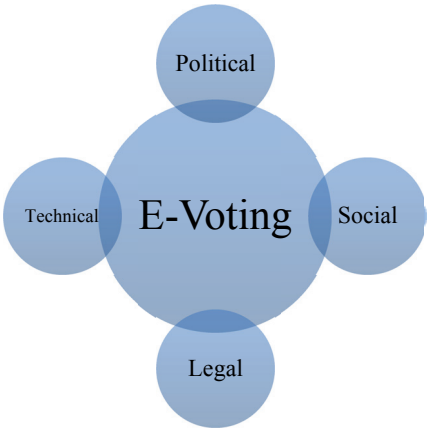


Figure 1. Aspects of Electronic Voting

Very often researches depart from technological characteristic of new technology, neglecting all other aspects. This is true not only for e-voting, but many other implementations of the modern technologies in everyday life.

More recently, it has been recognized that an important characteristic of modern technology is the existence of complex and large technical systems - spatially

extended and functionally integrated socio-technical networks (Mayntz and Hughes, 1988 in Oostveen, 2007) in which research of the 'social' and 'technical' side cannot be separated. As Lamb et al. (2000) point out: "ICTs do not exist in social or technical isolation".
Large technical systems have following properties (Oostveen, 2007):

- They affect many people and institutions;
- They are complex: political, legal, administrative, organizational and technical issues are relevant in the design, development, implementation, maintenance, and use of these systems;
- They are infrastructures, and face difficult issues of standardization;
- They generally embody political ideas and ideologies.

In the rest of the paper we will try to give advantages that e-voting is bringing, but also risks associated with it.

Advantages of Electronic Voting

In the past 25 years organized participation in society gradually has declined in many countries of Europe. (Van Dijk, 2010). Electronic voting is seen as a mean to increase participation, notably political participation. Key argument for the advocates of e-voting is increased convenience brought by the new technology. E-voting has the potential to make the voting process **easier and more accessible** for electors. There is a potential to eliminate long line-ups at the polling stations and better address accessibility issues for people with disabilities, those suffering from illness, those serving in the military or living abroad, those away on personal travel, and other groups of citizens such as single parents who may find it difficult to visit a traditional polling station.
With regard to **young people** aged 18 to 30, internet voting may be the way to engage them in the elections. This group of voters seems to be the hardest to reach by traditional political methods. E-voting may use their natural interest and familiarity with modern technologies.
Internet voting allows **greater secrecy** for electors with disabilities (including visually or hearing impaired). By voting electronically and therefore unassisted, these voters are afforded a greater degree of anonymity when casting a ballot.
By the nature of its work and life style, modern man & woman have less space constraints. Krzywiecki and Kutyłowski (2010) think that the traditional voting attached to the place of living is surpassed model of 19th century. E-voting is offering **voting without geographical and time constraints**.
Another promise of electronic voting is **the universal verifiability** which is impossible with the traditional voting. In traditional voting we have to trust our proxies (poll watchers) which observe voting procedures directly at the polling stations. In e-voting any interested party using internet can check if only eligible voters voted, if each voter casted only one ballot and if all casted ballots are included during tallying.

E-voting **does not have a 'point of no return'** after which voter cannot change his/her mind. That point in traditional voting is the moment when voter puts the ballot into the ballot box. Current implementations of e-voting offer a possibility to cast a ballot number of times, and only the last one will be the one that counts.

From the political point of view, e-voting has the advantage of **faster tallying** and **reduced number of invalid ballots**. Reduced time gap between elections and the announcement of final results decreases uncertainty of electorate and thus restore the trust in political system. Same applies for lower number of invalid ballots.[2]

Over the long term all types of internet voting have the potential to be **less expensive** to operate and execute than traditional paper ballots which require setting up and staffing polls. However, the start-up costs can be very high.

Electronic Voting Risks

Critics of internet voting express concern about security and about the lack of equal access to the internet for all citizens.

If we concentrate on social perception of electronic voting, one thing that needs to be considered is **technophobia** - fear or dislike of advanced technology or complex devices, especially computers. Although this fear could look like a little bit irrational, it is evident and has to be considered.

Another reason against e-voting is the **importance of elections for local community**. For the large number of citizens a moment when they cast their ballot is the symbol of their political activity. Having in mind the fast modern life style, traditional voting is one of the rare moments when people can meet and talk with their neighbors.

The **loss of the civic ritual** is also mentioned in many articles about internet voting. E-voting would make elections less of a community event, which might create a greater gap between citizens and the government, thereby decreasing political participation. Some believe that voting is more than the simple act of disclosing one's political preference; it is a vital public ritual that increases the social cohesion and unites citizens together.

Important risk is a potential for '**digital divide**'. This divide can occur in several different ways. There is a digital divide between those with and without computers, with and without (fast) internet access. Technical opportunities are not the same for wealthy and poor people, those living in urban and rural areas. Basically, internet voting has the potential to create divides with respect to many socio-economic variables: income, education, gender, geography, race and ethnicity.

[2] But e-voting system **must have** an option for voters to cast invalid or blank ballot, since it is a common way for voters to protest against offered choices.

Internet voting presents greater opportunity for **frauds, bribery and coercion**. Voting from home enables family voting. Also, it is possible that coercer will vote on someone's behalf, since voting is happening at the remote private place. That's one of the greatest risks of remote voting compared to the traditional voting in controlled environment of the polling station.
There is an additional opportunity for fraud or accidental failure in e-voting systems if voter's computer is attacked by viruses. A potential weakness of internet voting is its vulnerability to a variety of **hacker created problems** (web site spoofing, denial of service attacks, etc.). Individual hackers, criminals, and foreign intelligence services are among those who might try to manipulate the vote or destroy the technology used to run the election. (Rogerson, 2003).
Last but not the least, traditional voting procedures are rather simple and effective and many will argue that there is **no need for electronic voting** at all.

Implementation of Electronic Voting in European Countries

Some countries employ electronic voting for years and other countries begun with the testing and pilot projects. Yet in some cases electronic voting has been abandoned even before it was tested, no matter how much money or time was spent. Reasons are varying but in general it's because public concerns were raised about security, reliability and privacy.
Netherlands, one of the European countries with the longest history of electronic voting, said no to e-voting in 2008. The Ministry of the Interior decided that way after reviewing extensive research which indicated that none of the available machines offered adequate privacy and security safeguards.
In Germany, Federal Constitutional Court decided in 2009 that electronic voting used for the last 10 years, was unconstitutional and therefore not to be used for the upcoming elections. The court ruled that the use of the electronic machines contradicts the public nature of elections.
Irish Minister for the Environment announced in 2009 that the electronic voting system was to be suspended, due to the cost and the public's dissatisfaction with the current system after spending more than €54 million on the machines.[3]
However, there are successful stories with the electronic voting. Estonia is the only country which offers its voters possibility to vote by internet in absolutely binding national elections. Estonia has been using internet voting since 2005 in five election cycles so far.
In Norway it has been announced that electronic voting over the internet will be tried out in certain areas for local elections in September 2011, with the ultimate

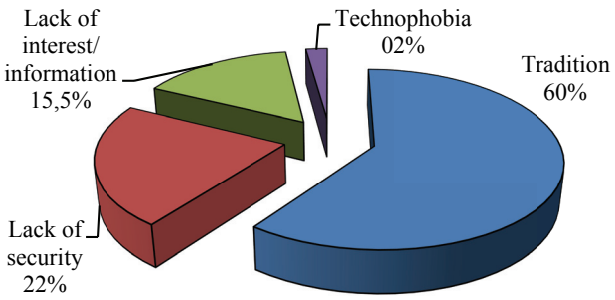
[3] Irishtimes.com, http://www.irishtimes.com/newspaper/breaking/2010/1006/breaking26.html

goal of implementing full general availability for internet voting for the 2017 parliamentary elections.[4]
Since 1998, the Swiss government has actively pursued the implementation of electronic voting in its elections. Successful systems have worked in the test cantons of Geneva and Zurich (Gerlach and Gasser, 2009).

Existing Researches

Across the world a number of interesting sociopolitical researches have been carried out on the topic of electronic voting. Most of them followed binding elections or test projects that used e-voting. We are going to present selected findings from these researches.
Reniu (2009) carried out different surveys in Spain, Mexico and Argentina, trying to outline which are the main perceptions of citizens when using different e-voting solutions. This research covered public and private e-voting events being these events binding or not, using only e-vote or together with the traditional vote, and with remote voting or DRE.
Surveyed people felt **quite satisfied** with the use of e-voting, rating their satisfaction with a median value of 4,2 out of 5. Another important finding is the **lack of trust in e-voting**, especially binding remote internet voting. Some of the examined projects had an option for the voters to choose between e-voting and traditional voting. When asked why you chose to vote traditionally, common answer was: "We always cast our votes using paper ballots and transparent urns and, more important, we meet each other at the polling station, sharing the democratic liturgy."

Chart 1. Reasons for opting traditional voting (Reniu, 2009)



[4] Prosjektdirektiv for e-valg 2011, Kommunal- og Regionaldepartementet. February, 11 2009. http://www.regjeringen.no/upload/KRD/Vedlegg/KOMM/Evalg/Prosjektdirektiv_evalg2011_v101.pdf

Same research confirms general support for the remote voting (almost 80% of respondents) but with the condition to have an option to vote traditionally or not.
Oostveen (2007) conducted researches in France, England, Italy and Finland. E-voting systems that were analyzed included a variety of e-voting technologies: a smart-card internet voting system which was used at home, work, and in school; a web-based voting system; and voting computers at the polling booth.
Among other findings, one that is attention-grabbing is **lack of trust in privacy** of remote internet voting system (TrueVote®).

Table 1. Opinions about usability of the remote voting system (Oostveen, 2007)

	Yes	Neutral	No
Trust in security (against fraud and hackers)	60%	17%	23%
Trust in secrecy (privacy)	5%	11%	84%
Trust in accountability (verify the vote)	62%	16%	22%
TrueVote is easy to use	92%	4%	4%
TrueVote is fast	77%	13%	10%
TrueVote is easy to install	65%	15%	20%
TrueVote is robust (not vulnerable for pincode/pincard loss)	52%	21%	27%

While voters believe in the security of e-voting system, 'Big Brother' effect is over-emphasized and almost no voters believe that their ballot casted over the internet will remain secret. There is a fear that the vote is not anonymous since the operations would be registered on the computer. Many of the participants believe that governments have a lot of information about citizens and are afraid that e-voting will only add to that information.
Elections Canada survey data (Goodman et al., 2010) offers insights regarding the probability that people will vote by internet. In 2000, for example, 47% of the respondents report being likely to vote online, in 2008, **interest rose** to 54% of the electorate. Aside from those voters over the age of 54, a majority of respondents in all age groups indicate that they would be **likely to make use of the online voting** if the service was available.
Based on the research results from three Canadian pilot projects with the internet voting for local elections, we can conclude that implementation of internet voting as an additional option **does not automatically increase the turnout**. Interesting data comes from Canadian city of Peterborough - 70% of online voters were **45 and older**, and the highest rate of use was among electors aged 55 to 64. Only 14% of those aged 18 to 34 voted online (Goodman et al., 2010). The higher usage rate among 'baby boomers' is interesting because most survey data indicates that young people are more inclined to report using, or saying they would make use of, internet voting than other cohorts of electors.
Experiments with internet voting in Switzerland can be considered successful. Switzerland is one of the most developed countries with high rates of internet penetration. Also, Switzerland has a long tradition of postal voting, and remote

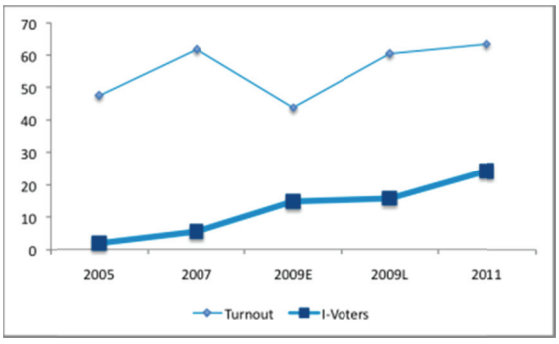
internet voting is seen as an extension to this popular method. Data discloses that there is no digital divide with the respect to education or gender, but one is visible in terms of **age and internet competence**.

One of the key reasons for success of internet voting in Switzerland is trust in state's voting system, correct outcome of elections and **the trust in country's political system** in general (Gerlach and Gasser, 2009). Although e-voting system in Switzerland is technically far from being 'state of the art', nobody even raised a question about secrecy nor tried to fool the system.

Estonia is the only country in the world to have legislated internet access as a social right (Trechsel, 2007 in Goodman et al., 2010) and is one of the most electronically enabled countries in Europe. These elements, and the fact that internet voting in Estonia can be considered an electoral success, made it an important case for the research.

This year the turnout in Estonia further increased in comparison to the years before and especially to the record turnout in 2009. In total 140.846 Estonians casted their vote over the internet.

Chart 2. Turnout and number of internet voters in Estonia[5]



The number of young voters is constantly at 10% of the internet voters. In contrast, voters above 55 account for 18% of the internet votes on average supporting underlining the trend of the '**silver surfer community**' (similar to Canadian case mentioned earlier). This may lead to the conclusion that the hypothesis about age usage may be doubtful.

Conclusion

Lessons we can learn from countries that use e-voting helps countries like Bosnia and Herzegovina to draw its own road map for the implementation of e-voting systems. The blank paper we have in front of us may be our advantage in sketching trouble-free path to the e-voting. We can avoid repeating failures that

[5] Source: e-voting.cc

others had. Here are some best practices and recommendations for the implementation of e-voting systems:

- Politics heavily rely on interpersonal relations and cannot be entirely transferred to cyber world, since people still want some community gatherings;
- Citizens will have trust in e-voting system only if they have trust in the political system. Both needs to be built simultaneously;
- E-voting has to be complementary tool, not sole way for voting;
- If properly implemented, e-voting system can attract all age groups of voters;
- Start with small-scale tests and gradually increase the number of included voters. Avoid too many non-binding test projects;
- All involved actors (voters, political parties and candidates, media, NGOs etc.) need to be involved in the development process;
- Education of voters is crucial. Do not assume that voters will know how to use electronic systems.

There is almost no doubt that internet voting will progressively be implemented in most democratic countries. And, for the countries like Bosnia where no notion about e-voting exists, it is better to skip the step with electronic voting machines and go directly to the internet voting. Development of such systems can be hard and expensive, so buying some proven system sounds like a reasonable choice, with the necessary adjustments to specific legislation.

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