



Estonian Ministry of Foreign Affairs



e-Governance Academy

## **Conference**

# **E-VOTING: LESSONS LEARNT AND FUTURE CHALLENGES**

**Tallinn (Estonia), 27-28 October 2006**

## **Conference Report**

**Rapporteur: Fabian Breuer**

*Organised by the Council of Europe, the Estonian Ministry of Foreign  
Affairs and the e-Governance Academy (Tallinn)*

The conference “E-voting: lessons learnt and future challenges” (27-28 October 2006 in Tallinn, Estonia), organised by the Council of Europe, the Estonian Ministry of Foreign Affairs, the Estonian National Electoral Committee and the Estonian e-Governance Academy, brought together international scholars and practitioners from various disciplines to discuss a range of topics relating to e-voting. The purpose of the conference was “to understand the Estonian e-voting experience and to put it into a wider context”. The central themes focused on both legal and practical problems and the challenges of e-voting as well as on the general use of the internet in political campaigns in order to raise the participation of voters.

Holding the conference in Estonia was a choice born of practical as well symbolic reasons since Estonia has adapted a progressive ICT-policy and is very experienced concerning the use of e-voting and other means of e-participation. In the October 2005 local elections, Estonia became the first country in the world to hold countrywide public elections where people could cast their vote over the internet.<sup>1</sup> Based on the overall positive evaluation of the introduction of e-voting in these elections, the Estonian electorate will very probably also have the opportunity to vote over the internet in the parliamentary elections in March 2007.

The conference lasted two days and the first day’s presentations and discussions were split up into four different sessions covering various aspects of electronic voting.<sup>2</sup> While the first part of the conference was open to the wider public, the second day consisted of a focused expert roundtable on the results of the conference. Hence, the report will be structured as follows: in the first part, the most important issues and conclusions of the conference presentations and discussions will be highlighted, while the second part will give an overview of the deliberations and key outcomes of the roundtable. In doing so, the report’s aim is not to give a descriptive summary of the different presentations and contributions, but to highlight the fundamental as well as controversial issues, new developments and problems of e-voting as an additional voting channel that require further consideration or research. The report will end with some general conclusions and specific recommendations based on the debates of the conference.

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<sup>1</sup> See for an analysis of these elections the Council of Europe report on e-voting in the 2005 local elections in Estonia, [http://www.coe.int/t/e/integrated\\_projects/democracy/02\\_Activities/02\\_e-voting/00\\_E-voting\\_news/FinalReportEvotingEstoniaCoE6\\_3\\_06.asp#TopOfPage](http://www.coe.int/t/e/integrated_projects/democracy/02_Activities/02_e-voting/00_E-voting_news/FinalReportEvotingEstoniaCoE6_3_06.asp#TopOfPage).

<sup>2</sup> For an overview of these sessions, the presentations and the participants of the conference see the attached conference programme.

## **I.) PRESENTATIONS**

The main issues of the different presentations can be categorised - roughly guided by the four different sessions of the conference - into the subsequent topics.

One main strand of discussion considered the experiences and the more general lessons learnt from the Estonian e-voting project. In this regard, Alexander H. Trechsel presented the results of the study on the local Estonian elections in 2005, which was conducted on behalf the Council of Europe.<sup>3</sup> He underlined the political neutrality of e-voting and the fact that chiefly computer knowledge and trust in the e-voting procedure are the determining variables concerning the decision to use e-voting. On the other hand, demographic factors (such as age, gender, education, income) seem to be of only minor influence. Based on these findings, an enhancement of the ICT-literacy of voters was recommended. In addition, the Estonian e-voting project was considered to have the potential to serve as a model in order to develop best practice recommendations for other countries interested in using the internet as a voting channel. On this topic, Ivar Tallo gave a presentation on the key issues of the Estonian e-voting experience and he stressed that the organisation of elections should adapt in line with general societal developments. This consideration points to the introduction of e-voting and other means of e-participation in contemporary democratic societies. At the end of the first session, Fernando Mendez discussed the comparative aspects of e-voting projects from a political science perspective. He stressed that e-voting experiences are unique laboratories for academic research and that comparative insights should be used in order to gain explanatory variables for varying e-voting arrangements.

The session on legal and constitutional issues of e-voting addressed some potential difficulties of this new voting channel. A crucial question and legal problem is how to achieve voter verification when e-voting is applied (which is rather simple in traditional paper voting). As the control of the system can only be overseen by the “normal” citizen with great difficulty, this task has to be delegated to a significant extent to technical and other experts. This, however, is a serious issue and can lead to various dilemmas and result in a lack of trust. In order to overcome this problem, Jordi Barrat Esteve suggested the possibilities of paper trails, independent audits and a social approach. The latter approach has meant that some countries have accepted weaker legal electoral controls in the application of e-voting tools. Such an

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<sup>3</sup> See footnote 1.

approach can be based on political and electoral cultures, which can accept an attenuated citizen control over the electoral process if the new voting channel is able to solve other problems (such as low turnout, disabled people and absentee voting). Ülle Madise elaborated on legitimacy issues and highlighted the concrete handling of political and legal questions in the Estonian e-voting project. She stressed that there is no neutral voting technique, but this is no reason to reject new voting tools. To take one example, postal voting, which seemed to be favourable for some parties in the years 1992-99, does no longer seem to be so today. Providing voting tools should be regarded as a public e-service, and every additional reliable tool serves the principle of universal suffrage. She also pointed out that the Estonian National Court has approved the approach, according to which the possibility to replace the e-vote with another e-vote or paper ballot is a precondition of constitutionality of e-voting, as without the right to change the e-vote, the principle of free voting cannot be guaranteed by remote Internet voting. The Estonian National Court also made reference in its decision to Recommendation Rec(2004)11 of the Council of Europe of 30 September 2004 to member states on legal, operational and technical standards of e-voting, and explained that the right to change the e-vote is in accordance with the Recommendation as well. At the end of the presentation, Ms Madise discussed the potential impact of Internet voting on the principle of democracy and concluded that whilst Internet voting alone is not able to solve the problems of contemporary democracy, some other Internet-based solutions could be quite helpful, e.g. some smart vote programs could facilitate the orientation in the programmes and previous political activities of the parties.

Related to this issue is the overall level of confidence and trust regarding e-voting. As Epp Maaten underlined, it is crucial to keep e-voting transparent, public and understandable. In the Estonian case, polls show that most people were not entirely convinced by the transparency of the system, but that they trusted e-voting because of a general trust in political institutions and the election organisers. To increase the general level of trust and transparency, the presenter recommended accompanying the system development with broad public and expert discussions as well as appropriate documentation, tests and auditing.

Referring to the Recommendation of the Council of Europe on legal, operational and technical standards for e-voting<sup>4</sup>, which is currently the first and only international legal

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<sup>4</sup> Recommendation Rec (2004) 11 on “Legal, operational and technical standards for e-voting” was adopted by the Committee of Ministers of the Council of Europe on 30 September 2004 and can be found on

instrument in this field, Michael Remmert of the Council of Europe stated that the fundamental principles of traditional democratic elections are to be applied to e-voting, as e-voting systems should be as reliable and secure as traditional voting procedures. He added that since the adoption of the Recommendation by the Committee of Ministers two years ago, more than ten Council of Europe Member States have been running pilot projects or have prepared reports to investigate a possible introduction of e-voting. The existing European minimum standards may be used as benchmarks by countries that are introducing or are considering introducing e-voting, helping them, in particular, to create a sound legal basis for e-voting. In addition to piloting, a broad and open dialogue as well as further research and system development seem to be necessary.

Related to the issue of transparency in electronic elections, the more general question of election observation regarding the use of new technologies was brought up. It was made clear that the use of such technologies in democratic elections provides both new challenges as well as opportunities and that electronic voting procedures have major implications for all aspects of the voting procedure. As Jonathan Stonestreet pointed out, OSCE/ODIHR has initiated a project to develop guidelines on observation of new voting technologies and has conducted some election observation and assessment activities in OSCE participating States that have begun to implement electronic voting. Main areas of interest in this regard are certification and testing, the secrecy of the vote, security and accessibility questions, accountability, a manual audit capacity and the overall legal framework.

Finally, the issue of internet campaigning was discussed. As Thad Hall made clear, the internet is in general a strong civic education tool and has the potential to democratise elections, because it promotes political knowledge and complements traditional information and deliberation possibilities. The presenter introduced some examples of American campaign websites and pointed to some controversial effects of internet campaigning.

The first conference day concluded with a panel discussion, moderated by Liia Hänni, between representatives of various Estonian parties. Focusing on e-campaigning and e-voting as a means to increase voter turnout, the majority of the participants underlined the desirability of developing e-voting and the enhanced use of ICT in democratic practices. In this regard, the importance of overcoming the digital divide and the necessity to increase

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[http://www.coe.int/T/E/Integrated\\_Projects/democracy/02\\_Activities/02\\_e-voting/01\\_Recommendation/Rec%282004%2911\\_Eng\\_Evoting\\_and\\_Expl\\_Memo.pdf](http://www.coe.int/T/E/Integrated_Projects/democracy/02_Activities/02_e-voting/01_Recommendation/Rec%282004%2911_Eng_Evoting_and_Expl_Memo.pdf)

voter's confidence as well as to develop sound guidelines for e-campaigning were underlined. However, a minority view – mainly presented by the representative of the People's Union of Estonia (*Eestimaa Rahvaliid*) – was against the further introduction of e-voting. The opponents argued that the political neutrality of e-voting could not be guaranteed and that neither the voter's identity nor the secrecy of the vote could be assured. In addition, the accuracy of the ballot counting and the possibility of guaranteeing the safety of e-voting systems were put in doubt.

## **II.) THE FOCUSED ROUNDTABLE AMONG EXPERTS**

The roundtable opened with a presentation of the rapporteur on the main outcomes and debates of the previous day's presentations and debates. Based on these, the roundtable discussion among the various experts developed along the following lines and issues.

### *Research on e-voting*

A first matter of interest concerned (academic) research on particular e-voting experiences and possible contributions to the further and more general implementation of e-voting. In this regard, all discussants underlined the importance and necessity of further research on e-voting so that political authorities, decision-makers and international organisations can base further discussions on such academic studies, which supply facts and insights on voters' attitudes towards and the functioning of e-voting. Major arenas of research in this regard should include the question of political neutrality of e-voting, the checking of the hypothesis that people return to e-voting having used it already once and to answer the questions if and under which conditions e-voting may increase voter turnout and why people might refrain from using the e-voting channel.

Concerning the techniques for researching e-voting processes, the use of panel studies and focus groups was suggested in order to widen the possibility of insights into voters' attitudes. Linked to this is the necessity of conducting longer term time-line studies, which allow the assessment of time developments and the tracing of changes. In this regard, it was suggested that something similar like the American National Elections Studies<sup>5</sup> could be introduced to understand and follow the patterns and functioning of e-voting procedures.

In addition, future studies should not only focus on the mere election periods or days, but they should explore as well what happens before and after the casting of the ballot (blogging, platforms, campaigns, attitude of parties,..). Test-voting and pre-tests have to be conducted and analysed in order to gain concrete insights into how people exercise e-voting and what the reasons for a lack of trust might be (in this respect, the use of focus groups promises to deliver very valuable insights). The overall aim must be to gain deep and fruitful insights and to analyse the overall political and electoral culture concerning e-voting procedures.

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<sup>5</sup> See <http://www.electionstudies.org>.

Concluding the debate on academic research on e-voting, the representatives of the Estonian Central Electoral Commission and the Council of Europe stated that their organisations continued to be interested in further academic research on e-voting. In this regard, it was stressed that a crucial question is how to practically use the results of academic research and how this can lead to concrete policy conclusions. Furthermore, the e-Governance Academy, the European University Institute, the Estonian Electoral Committee and Tartu University envisaged strengthening their joint research efforts.

### *Observing e-voting, Legal Considerations and Technical Issues*

There was a broad general agreement that a more systematic approach for observing e-voting is needed, which takes into account wider rule of law issues, general election rules and the possible role and opportunities as well as restrictions of observers. Overall, it was concluded that e-voting has to be analysed with instruments other than for traditional paper voting procedures. Nevertheless, efforts have to be undertaken to bring the observation of e-voting in line with traditional election observation standards and to develop particular minimum as well as ethical standards for observation. It is clear, however, that at present, no particular e-voting observation techniques are available.

To tackle this problem, the OSCE/ODIHR has, as has already been mentioned above, embarked on developing guidelines on observation of new voting technologies. Such standards have to be developed in order to provide evidence for the well-functioning of electronic voting, in accordance with electoral legislation and international election standards.

From a legal point of view (as well as an election observation perspective) it is furthermore important to take into account possible scenarios where problems occur in the concrete application of e-voting. The consequences of e-voting results being contested and possible problems with the validity of the election results need to be faced. In this regard, the law can only provide a starting point while more must be done to develop sound observation and auditing practices. If one imagines, however, a legal appeal against election results based on e-voting channels, the judges would be in a rather difficult position as they would have to trust the judgements and opinions of experts. This is why it is important to envisage a full disclosure of the system and the involvement of a variety of experts. Based on this hypothetical example and from a technical point of view, it seems important that all the elements of an e-voting system be accessible to experts who should get the possibility to test

the system and to comment on it. Such an openness of the system to experts was seen as being of high importance to provide a sound legal basis and to increase trust in e-voting as a voting channel.

Even though IT-experts and auditors should certainly have the possibility to check and to control the validity of the system, the question of how far the technical side of the system should be understandable for the wider public could not be fully answered. However, there was a consensus that the interested public should have the possibility to gain insights in the technical functioning of the system as far as possible. One way to offer such a possibility could be that the election authorities organise training courses for citizens being interested in understanding or in observing e-voting procedures (in fact, such courses were offered by the Estonian Electoral Committee but public interest in them was rather limited).

In addition to the involvement of various IT-experts in guaranteeing the sound performance of e-voting systems, the provision of some straightforward technical safeguards was suggested. The algorithms of the software used should be accessible and accuracy tests should be performed before, during and after the elections. Moreover, the accuracy and correctness of the applied software is of crucial significance and it has to be proven that the software is not being changed or altered during trial phases and the actual running of elections. Furthermore, the involved servers must be sealed and protected and several sub-systems as well as computers processing the data should be disconnected from one another.<sup>6</sup> To test the performance of the individual elements and to detect possible weaknesses of the system, computer hackers should be invited to test and to attack the system with a view to improving it. Moreover, all processes of the e-voting system should be logged in order to monitor what happened and what voters did, without, however, violating the basic principle of the secrecy of the vote.

What seems to be needed in more general terms is the provision of an international check-list focusing on legal, technical and social issues. Such a check-list could simplify the task of proving the correctness of an election even though it will be difficult to gain concrete physical evidence – a fact which may potentially result in legal contestation and friction. Regarding the question of physical evidence, however, some participants put forward that some virtual proof for the individual voter who cast a ballot should be provided (as suggested in the presentation

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<sup>6</sup> See for the Estonian case an overview of the Estonian e-voting system and its technical aspects offered by the National Electoral Committee at <http://www.vvk.ee/elekt/ docs/Yldkirjeldus-eng.pdf>.

by Jordi Barrat, examples of this are applied in e-voting projects in some countries using paper trails, alphanumeric receipts and random samples). On the contrary, the idea of striving for some form of physical evidence was contested by other participants as it could generally be judged to be “fake” and could be considered spurious and not available in a physically convincing format.

As mentioned earlier, it is important to control and to observe different stages of the election process. It is necessary to be able to guarantee the well-functioning of the system before the start of the election period, during the voting period and afterwards. This means that there must be a focus on certification processes before the processing of the data actually begins as well as on proper mechanisms for post-auditing of the elections.

#### Other issues

Concerning the problem of “family voting” and similar possible influences on the individual voter’s decision – which represent a major criticism of the use of internet voting – it was brought up that postal voting suffers theoretically from the same problem and that there exist means to guarantee the voter’s expression of free will (e.g. by introducing the possibility to recast the vote when it was cast via internet).

In addition, the exportability of the Estonian e-voting model (to other countries or European Parliament elections) and the wider application of e-voting in society (e.g. for voting procedures in trade unions or political parties) were discussed. In this regard, there was a broad agreement that the experiences and the technical as well as infrastructural developments concerning e-voting in the Estonian case should be further taken into account when testing and developing a general e-voting strategy in order to guarantee legal soundness, the political feasibility and the technical well-functioning of future e-voting applications.

### **III.) CONCLUSIONS AND RECOMMENDATIONS**

It can be concluded that the use of e-voting poses many opportunities as well as challenges to modern democracies. In brief, the main opportunities are a possible increase in voter turnout, the strengthening of democratic participation and the adaptation of democratic elections to broader societal developments. The main challenges are to answer diverse questions related to problems of trust and acceptance, legal and constitutional issues as well technical and observation standards. Based on the deliberations of the conference, the report concludes with some general recommendations to offer possibilities for answering these questions and to facilitate the introduction of e-voting.

Firstly, and from a more general perspective, the existing international minimum standards for e-voting should be taken into account and further standards for observation should be developed. Moreover, it should be considered to develop “best practice” guidelines as well as detailed technical standards and recommendations concerning the development of certification procedures, at the national and possibly European levels. In this regard, solutions should be found in accordance with the Council of Europe recommendation on e-voting<sup>7</sup>, which is a fundamentally important legal instrument.

For countries considering the introduction of e-voting, thorough legal analysis and preparations are recommended. Legal issues concerning the constitutionality of e-voting as well as issues related to electoral law have to be carefully analysed, as e-voting has to stand on sound legal grounds. In addition, legal mechanisms of auditing have to be developed and it has to be determined how possible appeals against e-voting results could be handled on a solid legal basis.

A further crucial consideration is the technical reliability and general functioning of e-voting. In order to ensure a well-functioning system, the involvement of various experts and IT-specialists is necessary. Besides, pre-test and test-runs of the system would be needed. More generally, a three step approach to strengthen the legitimacy and reliability of e-voting seems to make sense. One may first pilot the additional voting channel on a limited scale or low level of representation before later considering the application in elections or referendums,

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<sup>7</sup> Cf. footnote 4.

e.g., at the municipal level. If the gained experiences show convincing and satisfying results, one might finally consider an introduction in national legislative elections.

Furthermore, the overall computing knowledge among electorates as well as the overall dissemination of ICT-related practices should be enhanced if a country thinks about introducing e-voting. ICT awareness among the electorate is crucial and public policies strengthening it are very recommendable for e-voting-willing states. In addition, the development and the provision of an accurate technical infrastructure are recommended.

Moreover, nationally or individually made experiences with regard to the use of e-voting should be disseminated, discussed and shared with other polities who think about introducing the possibility of internet voting. In general, a broad and open dialogue on the opportunities and problems of e-voting is needed. International organisations, particularly the Council of Europe, should execute a guiding role in the coordination of such efforts.

Strongly related to this point is the recommendation that e-voting should be closely accompanied by academic research. Academic monitoring and analysing of elections, including the use of e-voting, is a crucial instrument not only for academia, but can provide valuable insights and recommendations for policy makers and can have a direct practical impact on the implementation of concrete e-voting models.

**APPENDIX**  
**THE CONFERENCE PROGRAMME**



Estonian Ministry of Foreign Affairs



e-Governance Academy

**CONFERENCE**  
**E-Voting: Lessons learnt and future challenges**  
October 27 – 28, 2006

**AGENDA**

**Friday 27th of October**

9. 30	Registration
10.00	Welcome speeches
<b>10.15 – 12.00</b>	<b>I session: Estonian e-Voting project – analysis and international comparison</b>
<i>Moderator Heiki Sibul, Head of Estonian National Electoral Committee</i>	<p>Study of e-voting in the 2005 local elections in Estonia (presentation of the report for the Council of Europe) – Alexander H. Trechsel, <i>e-Democracy Centre</i></p> <p>Experiences from the first country-wide Internet voting - Ivar Tallo, <i>e-Governance Academy</i></p> <p>Comparative aspects – combining Estonia, Geneva and Zurich - Fernando Mendez, <i>e-Democracy Centre</i> and Uwe Serdült, <i>University of Zurich</i></p>
12.00 – 12.15	Coffee break
<b>12.15 – 13.30</b>	<b>II Session: Constitutional and legitimacy issues of e-voting</b>
<i>Moderator Urmas Reinsalu, Chairman of the Constitutional Committee of the Riigikogu</i>	<p>A Constitutional Framework for Internet Voting Projects - <i>Jordi Barrat Esteve</i>, Electronic Voting Observatory, University of León</p> <p>Council of Europe recommendations on the standards of the e-voting - Michael Remmert, Head of Good Governance in the Information Society Unit of CoE</p> <p>Political and legal aspects of Estonian e-voting project - Ülle Madise, Tallinn University of Technology</p>
13.30 – 14.30	Lunch
<b>14.30 – 15.30</b>	<b>III Session: Transparency in electronic elections</b>
<i>Moderator Peeter Marvet, journalist, ICT expert</i>	<p>Election observation and new technologies - Jonathan Stonestreet, <i>ODIHR/OSCE Warsaw</i></p> <p>Building public trust in e-voting– Epp Maaten, Secretariat of the Estonian National Electoral Committee</p>
<b>15.30 – 17.00</b>	<b>IV Session: Going beyond e-voting (Internet campaigning and other features)</b>
<i>Moderator Liia Hänni, e-Governance Academy</i>	<p>Use of ICT in political campaigns – Thad Hall, University of Utah</p> <p>Panel discussion by representatives of political parties – How to use e-campaigning and e-voting for better voter turnout</p>
17.00	Closing remarks

## Saturday, 28th of October

10.00 – 13.00	Focused roundtable on the results of the conference among experts and rapporteur *
	<p>Among other, the following will be deliberated:</p> <ul style="list-style-type: none"><li>The aim and methodology of observing e-voting;</li><li>How to guarantee fairness of e-voting;</li><li>Should e-voting be considered a public service of information society;</li><li>Design of user-friendly interface for e-voting platform;</li><li>- Research questions for coming parliamentary elections in Estonia 2007.</li></ul> <p>*Rapporteur: Fabian Breuer, EUI</p>

\* The conference is organized by e-Governance Academy Foundation in cooperation with Estonian Electoral Committee, Ministry of Foreign Affairs of Estonia, and the Council of Europe

\*\* During the conference, a demonstration of the Estonian e-voting procedure will be available