"Every Vote Counts. Electronic Voting and Counting"
Electronic Voting at Polling Stations Study Commission in the Netherlands

Conclusions and recommendations

The commission has assumed the following seven principles of the electoral process[1]:

- **Equal suffrage:** Given the Dutch electoral system, each voter is permitted to cast one vote per election, which is counted once only in the counting of votes;
- **Accessibility:** Voters must be given every opportunity to participate directly in the election process. If this is not possible, there must be an opportunity to participate indirectly by the granting of a proxy;
- **Transparency:** The electoral process must be clear in its structure and organisation so that, in principle, everyone can understand it. The electoral process holds no secrets. It must be possible for questions to be answered and the answers must be verifiable;
- **Verifiability:** The electoral process must be objectively verifiable. The control tools may differ, depending on the method of voting decided on;
- **Free suffrage:** In casting his/her vote, every voter must be able to make his/her choice in complete freedom, without being influenced;
- **Secret suffrage:** It must be impossible to make a link between the identity of the individual casting the vote and the content of the vote cast. The process must be organised in such a way that it is impossible to tell in which way he or she has voted;
- **Fairness:** The electoral process must take place in a correct manner and it must be impossible to influence the result other than by the casting of legal votes.

Electronic voting and counting

To establish whether electronic voting and counting is possible and, if so, to find an optimum balance between the principles, the commission has made a comparison of four voting methods:

- Model 1: Voting and counting using a voting computer with a verified paper record;
- Model 2: Voting using a voting printer with electronic counting;
- Model 3: Voting using a ballot paper with electronic counting;

[1] The 'eligibility to vote' principle is not dealt with in this report, but is nevertheless one of the principles of the electoral process.

- Model 4: Voting using current ballot papers with manual counting;

The risk analysis would seem to conclude that both electronic voting on a voting printer with subsequent counting using a scanner, and manual voting with electronic counting have acceptable risks. What's more, these methods satisfy the principles applicable to the electoral process.

The commission believes, just like the Korthals Altes commission did in 2007, that these principles can only be guaranteed if the paper process represents the guiding principle. This means that the vote is not registered digitally, that the voter votes by placing his or her ballot paper in the ballot box, that ballot papers can indeed be electronically counted, but manual counting always remains possible. Furthermore, the scanner prints the result of the count and the printed result is the determining factor as far as the final outcome is concerned (and not the result saved on a digital medium). The commission makes a clear differentiation between the casting of a vote and the counting of the votes. For that reason, voting and counting on a voting computer, even though the voter receives a verified paper copy, is not a suitable method.

Electronic casting of a vote enables voters with a disability (especially the visually impaired) to cast their vote autonomously and increases the likelihood that all voters will be able to cast their vote as they intended. All voters will be given feedback before their vote is actually printed. For this reason, this voting method has the commission's preference.

Electronic counting means that the counting is more reliable, more accurate and effectuated more quickly. This will have a positive influence on the confidence of voters in the outcome and the burden on polling station staff is significantly reduced.

The commission recommends:

- *The use of electronic aids to make the voting and counting processes more reliable and more accessible;*
- *To this end, account will be taken of the preconditions formulated by the commission;*
- *The introduction of a single nationwide voting system, consisting of a voting printer so that the voter can print his or her ballot paper and a scanner to count the votes electronically;*
- *This system can be made suitable for all voters;*
- *It should be clear in legislation that the paper process provides the guiding principle;*
- *Should the voting method proposed by the commission not be implemented, in whatever event it recommends the introduction of electronic counting linked to the introduction of a smaller ballot paper.*

Transparency, verifiability and fairness

The electoral process must remain transparent and verifiable for voters. Voters must be able to understand and preferably verify that the electoral process is fair. Voters can have confidence in the process only if no specific technical know-how is required to understand it. This is possible if the paper process prevails.

The commission acknowledges the fact that electronic voting and counting is susceptible to software errors and manipulation. The commission deems the risks acceptable in view of the fact that the vote is only registered on a ballot paper and that the count is verifiable by ascertaining that the equipment has worked properly.

The commission recommends:

- *Printing the voter's preference on the ballot paper in a language he or she can understand (no barcodes);*
- *The information should stress that each voter check his or her preference has been correctly indicated on the ballot paper;*
- *Making use of random checks of the count to ascertain that the scanning equipment has functioned correctly;*
- *A more detailed analysis of the practical effects of these checks and involving statistical experts for this purpose.*
- *To publish all official reports together with the counting strips from all polling stations so that, in theory, anyone can verify the results.*

Secret suffrage and free suffrage

The commission acknowledges that it is impossible to establish an electric electoral process that is 100% protected against the interception of compromising emanations. However, it is possible to limit the risks by taking measures aimed at reducing these. This is subject to significant additional costs. In spite of this, there remains a possibility for individuals intent on finding out voters' secret voting patterns to do so through the interception of compromising emanations. The commission emphasises that it is also possible under the current voting process to find out the secret voting patterns of voters by secretly placing (minute) cameras in polling booths. The commission therefore believes that these risks are comparable and acceptable. The commission also believes that there is an extremely small risk of there being individuals who are intent on influencing the voting intentions of voters by means of intercepting compromising emanations.

The commission recommends:

- *Ensuring that the voting printer does not save the vote, but just prints the ballot paper. As a result, the sequence in which votes are cast cannot be linked to the sequence in which voters were given access to the vote;*

- *Measures are taken to reduce the level of compromising emanations from the voting printer so that these cannot be intercepted without requiring exceptional effort within a range of 8 metres of the voting printer;*
- *Criminalising efforts to impair the fairness of the electoral process, including the interception of compromising emanations or the positioning of cameras;*
- *Having the scanning of the ballot paper carried out by polling station staff after the vote has closed and not by voters themselves. In this case, scanning equipment does not need any safeguards to protect it from compromising emanations;*
- *As part of the public debate, emphasising that voting secrecy can be violated in other ways.*

Accessibility

Availability

The use of electronic equipment brings with it the risk that there will be no properly functioning equipment on the day of the election. This state of affairs, which would result in the election having to be postponed, is more likely to occur than is the case voting with a pencil and paper.

Equal suffrage

The risk of a voter casting a spoilt or an unintentional vote is smaller with electronic voting than without the use of electronic equipment, because the voter receives visual or audible feedback before making his or her final choice.

Electronic voting provides voters with a disability (in particular those who are visually impaired) with a greater likelihood of voting autonomously though the use of audio devices and tactile keys. It should be added that, following talks with organisations representing disabled groups, the commission recognises that the physical accessibility of polling stations currently (also) falls short of the standards. The commission also assumes that measures to improve accessibility will not result in a higher turnout because these voters can now cast their votes by proxy.

The commission recommends:

- *Including alternative measures in the legislation should it prove not possible to use electronic means in the event of an emergency;*
- *Providing voting machines with an audible signal or tactile keys so that a voter with a disability can still vote;*
- *Investing in the improvement of the physical accessibility of polling stations.*

Weighting of principles

No single principle in the electoral process is absolute. However, the use of electronic media influences the balance which exists in the paper process between these principles.

The commission recommends:

- *Viewing the principles of free suffrage and secret suffrage explicitly as an extension of each other;*
- *Bearing in mind the independent participation of voters with a disability, allowing the principle of accessibility to weigh more heavily than the risk of compromising emanations being intercepted.*

Requirements

The commission has drawn up a package of functional, technical and security requirements which a voting printer and scanner must satisfy. The package of requirements can be used as a basis for drawing up legislation and for the acquisition of equipment on the market.

The commission recommends:

- *Tying in as much as possible with tried and trusted industry standards, norms and guidelines with respect specifications, production and management of equipment; making public the designs of the voting printer and scanner and publishing the source code of the software used; developing the voting printer so that that compromising emanations are restricted in such a way that they cannot be intercepted within a range of 8 metres without significant effort;*
- *Developing equipment using of a security profile based on the common criteria;*
- *Having the security profile drawn up by independent experts;*
- *Safeguarding the voting printer and scanner in such a way that they can no longer be used in the event of unauthorised use by third parties (as is usual for PIN terminals);*
- *Setting requirements with respect to the procedure (development, maintenance, testing, storage and distribution) in order to guarantee a transparent and verifiable process;*
- *Carrying out regular audits to check whether the requirements are being satisfied;*
- *During the trial phase, the commission recommends testing various forms of authorisation for casting the vote on the voting printer to see which solution gives the best results.*

Certification

The best method of ensuring that the equipment supplied meets the requirements and is secure is to make use of an independent agency which

certifies the system. The use of certification has consequences for the critical time frame which is peculiar to elections. Of course, certification takes place prior to the election, but if, for example, adjustments are required, the product needs to be re-certified which holds the subsequent risk that the certification process can't be finished in time or indeed that no certification can be given.

The commission recommends:

- *Initial certification being carried out by an independent body*;
- *Legislation providing for a situation where no certified equipment is available at the moment elections take place;*
- *Having a new risk analysis carried out every two years by independent experts to ensure that the equipment is able to withstand the latest threats and, if necessary, changing its security profile accordingly and having the equipment re-certified;*
- *Publishing reports on testing an certification.*

Procurement and Implementation Strategy

It is essential that experience is gained with respect to such far-reaching changes in the voting process, in the first place on a small scale by way of experiments during elections. This type of experience can not only be gained in trial situations. Elections following local government reorganisation provide a good opportunity for this. Large scale experimentation during general elections is only desirable if the technology has proved to be successful on the basis of a number of previous experiments.

The introduction of electronic voting means a change in the division of responsibilities in the electoral process. In the commission's opinion, responsibility for the organisation - which currently lies in the hands of local municipalities – cannot remain unchanged if electronic voting and counting is introduced. Municipalities have too few specialists in this area and as such are more dependent on a supplier, as experience from the past has shown.

The commission recommends:

- *Using experimental legislation on its introduction;*
- *Ensuring that electronic voting is introduced on a gradual basis by first gaining experience with at least two small-scale experiments and one larger-scale experiment before any definitive legislation is drawn up;*
- *Establishing one central administrative body which is responsible for procurement and administration of the voting equipment;*
- *Ensuring that the Ministry of the Interior (BZK) develops and maintains its own expertise with respect to electronic voting to prevent becoming dependent on a supplier;*

- *Tendering out the voting printer, the scanner and the software and their maintenance collectively to ensure the best possible coordination between the components;*
- *Taking a closer look at whether electronic voting should also be introduced in Dutch territories in the Caribbean.*

International context

Electronic voting in polling stations and electronic counting is not common in Europe. It is certainly possible to learn about the experiences in other countries, but the approach and the underlying principles differ widely per country. There are no systems in other countries that can be adopted lock, stock and barrel. What is surprising is that the problem of compromising emanations is not publically debated anywhere where electronic voting takes place. However, accessibility – especially in the United States – provides an important reason for introducing electronic media. Over the last five years there has been a noticeable trend towards differentiating between the voting and counting procedure with the use of scanning technology.

The costs of electronic voting

Electronic voting and counting is more expensive than manual voting and counting. Judging from discussions on the topic with the commission, the assumption amongst municipalities is that the use of electronic media makes the electoral process cheaper. This assumption is based on the costs incurred when voting computers were abolished. These costs are not comparable. The equipment used was not secure and it was possible to write off these over a period of up to 15 years. Developments in the field of ICT are taking place so rapidly that a period of depreciation of around 8 years is not realistic anymore.

At the minister's request, the commission has made an estimate of the costs of introduction. The conclusion of the commission is that it is impossible to calculate the additional costs of electronic voting with any accuracy. There are too many uncertain factors, both with respect to the acquisition price and the administrative process. For that reason they use an upward or downward margin of around 25%. The one-off purchase price is estimated by the commission to be between 150 to 250 million euros. The commission estimates the additional structural costs (minus the costs of investment) at between 6 and 10 million euros, above the current 42 million euros.

The commission recommends:

- *Assuming a technical lifespan for the equipment of around 8 years;*
- *Entering into dialogue with municipalities about the financing of the costs involved with the introduction of electronic voting and counting. Given the division of responsibilities proposed by the commission, the financing model for this is also required to be a topic of discussion.*

Time

The commission attaches great value to the need of having election results made quickly available, but is of the view that reliability and scrupulousness must always weigh more heavily than speed. The voting method proposed by the commission will lead to provisional results being made more quickly available than under the current process, but not as quickly as prior to 2008.

Consensus

The commission has spoken with various stakeholders in the electoral process. These included both advocates and opponents of electronic voting. The arguments put forward in these discussions provided an important basis for drawing up the risk analysis, the evaluation of the principles, the requirements, the implementation strategy and the management model. It was felt that voting with a voting printer and electronic counting as proposed by the commission, it was possible to fall back on an adequate level of consensus. Nevertheless, the commission deems it desirable to set up any ongoing process in such a way that its critics and other stakeholders can continue to follow its introduction at close hand.

The commission recommends:

- *Working in a transparent manner during the introduction process and regularly reporting back to the second chamber of parliament. Likewise, during the various steps which make up the implementation process, the commission recommends being as open as possible in its communication.*