Pushing water uphill;
Renewal of the Dutch electoral process [1]

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Abstract. This contribution addresses current developments in the reorganization of the electoral process in the Netherlands, a process that centers on a renewal of digital support tools. It will be clear that these developments have been stormy since 2017 and have not yet produced a satisfactory result.

Keywords: Elections, Electoral Process, Digital support of Elections

1 Introduction

In many democracies around the world, the organization and execution of elections are clearly and increasingly becoming points of dispute in polarizing political relations. Institutions are being questioned. If the result for a specific party or person is disappointing, one is quick to point out deficiencies in the execution of the elections. As a result, it not only becomes increasingly important, but also increasingly difficult to ensure and maintain a neutral organization and execution of elections. One has also to be aware that the digitization of elections has all kinds of risks, ranging from failing IT facilities (IOWA caucus 2020) [2] to the possibility of people systematically influencing elections (USA presidential election 2016)[3 Since the US presidential election at the end of 2016 there has been more emphasis on hacking. All in all, the process of ensuring safe, transparent and credible elections is under pressure.

Apart from attention to interference by external parties, there is discussion about the responsible use of all kinds of digital technology to support the logistically challenging electoral process. For each individual country, the final choice for the use of digital technology in the electoral process is the result of a balance between the specific requirements associated with elections.[4] These are, of course, general quality requirements that can be set on elections, whether or not laid down in laws or in internationally approved standards. Whether district elections or general elections are held, however, also makes a fundamental difference in the way the process is organized. Furthermore, the organization of the electoral process is partly determined by political culture and past experience.

This contribution addresses current developments in the reorganization of the electoral process in the Netherlands, a process that centers on a renewal of digital support tools. It will be clear that these developments have been stormy since 2017[5] but haven't yet materialized in a satisfactory result.

2   Outline of the baseline situation

In the 20th century, a start was made in the Netherlands with automated and digital support of the electoral process, such as the use of voting machines. This really took off at the turn of the century. However, after an extensive reflection on the reliability and transparency of the use of voting machines, these were banned from 2007 onwards. The main argument is the need for physical evidence (a ballot paper), so recounting is possible. After the abolition of voting machines, the Dutch Electoral Council started developing software in 2008 to support the process of determining the results. Within years, a program was developed which in the last decade became almost indispensable in order for the results to be determined within the statutory time limits. Shortly before the parliamentary elections in 2017, a public debate was held about the reliability and security of the application of this software. Under pressure from this debate, the Minister of the Interior decided to prohibit the use and application of components of this software – such as the exchange of digital files from the approximately 10,000 polling stations. It was only with great difficulty that the Electoral Council managed to present the results in time.[6]

About the organization of elections in the Netherlands

Every election in the Netherlands involves a system of proportional representation. Although political parties present their candidates as a single list, the law only allows a vote to be cast on a person. This means that all candidates must be given a place on the ballot paper.

In the Netherlands, only the national government can establish laws. For the implementation of these laws, the national government is heavily dependent on local authorities, which have a high degree of autonomy in this implementation. This also applies to the organization of the elections. Laws and regulations are laid down by the national government, but most of these laws and regulations are implemented by municipalities. In order to guarantee independence in the electoral process, an Electoral Council was set up, which acts as a central electoral committee in the elections to the two national Houses of the Dutch parliament, as well as in European elections. In provincial council or municipal council elections, the Electoral Council has no direct responsibility, although the Electoral Council does provide support in the form of advice and the provision of supporting software.

Almost 10,000 polling stations are set up on election day. All Dutch citizens who are entitled to vote can go on foot or otherwise by the most popular national means of transport, the bicycle, to a polling station from 7.30 am to 9.00 pm and cast their vote. In this respect, the voting process poses very few logistical challenges to voters. It does pose challenges from the moment the voters have cast their votes. Staffing nearly 10,000 polling stations is not an easy job. It is estimated that between 60,000 to 80,000 people are involved as volunteers in the exe-

cution of elections. It involves the staffing of the polling stations and the determination of the results. In practice, it is becoming increasingly difficult for some municipalities to find enough volunteers, even without the COVID-19 virus.

Immediately after the polling stations are closed, the votes cast on paper are counted by hand, an activity which may take long into the next morning. In the case of elections to the national parliament, the votes cast on all candidates must first be tallied at a municipal level, then at electoral district level, and must eventually be combined to form a single national result, and all this within a few days.

Following the execution of the 2017 elections, which were characterized by many incidents [7], all those involved were convinced that this should be 'once, but never again'. A structural solution for a better electoral process was sought in an innovation of the supporting software that can be used to determine the results. It soon became clear that merely an innovation of the software would be of little significance if it would not be part of an overall review and reorganization of the electoral process. For in addition to the software, it would also require a different management of the process, with a different division of responsibilities between the actors concerned.

3   Considerations for modernizing the electoral process

The basis of the electoral process was laid with the introduction of universal suffrage in 1919. At that time, there were only a few political parties and all candidates of these parties could be clearly placed on a single ballot paper. In the course of the 20th century, the number of parties involved in the elections increased, a development which continued strongly in the 21st century. In 2017, there were 28 parties that nominated candidates for the national parliament. This results in an ever larger ballot paper (70 x 50 cm), which becomes increasingly difficult to read. This poses a major challenge when counting all these ballot papers. It takes many hours to determine the result at the level of the polling station, an activity which, pursuant to the law, must take place within the polling station immediately after closure, at least for the time being.[8]

When voting machines were used on an ever-increasing scale at the beginning of the 21st century, the legislator saw cause to extend the closing time of the polling stations to nine o'clock in the evening. Although the voting can only be done on paper since 2007, this closing time has been maintained. This means that the counting can only start after 9.00 pm and in many polling rooms it takes until after midnight. This result must then be brought to the town hall that same evening, where an initial result at municipal level is determined that same night.[9] This could take until early in the morning, especially in large municipalities. The fact that these intensive and precise activities take place in the middle of the night, along with the fact that many of those involved have also been active during the day, increases the chance of inaccuracies

and errors. Municipalities are therefore increasingly critical of this procedure, and the call for the reintroduction of voting machines is growing stronger. In this respect, municipalities have public opinion on their side, and jokes are often made about the supposed archaic process; Statements such as "*it's hopelessly old-fashioned that you still have to vote with a pencil*" or "*If you can bank from home, why can't you vote from home?*" are often heard. However, the legislator is unyielding in its position, supported by good arguments, that the use of voting machines does not meet the requirements that can be set on elections.

The use of supporting software for determining the results only begins at the level of the municipalities, not in the individual polling stations. The total of all polling stations is entered at municipal level and recorded in a software system, which essentially only supports the counting process. Until 2017, the available digital results could then first be transferred to the electoral district and then to the Electoral Council by means of a password-protected USB stick. However, it was exactly the vulnerability of this digital recording and transfer of the results which was the topic of debate in 2017. Could the software be trusted? Were the software or the USB sticks not prone to error or easy to hack? Did the digital transfer not offer external powers, and perhaps also malicious foreign powers, the opportunity to hack and adjust the results? In the end, digital transfer via USB stick was banned at the 2017 elections, which led to an unexpected, almost uncontrollable, extra burden on the process.

The challenges are therefore of a different nature. Because of the social importance of elections, there is a great need for rapid publication of the results, causing permanent time pressure. But there is also a need for a safe and credible process when the results are determined. This means that there must be safeguards against fraud or inaccuracies, as well as for preventing external interference. This need for safety and reliability may rather require that the process must not be rushed.

There are several causes for the resulting pressure on the electoral process. It is therefore also very doubtful whether there is a single solution to achieving a much-desired secure, credible and transparent process. Trust is a fundamental part of democracy. It is the key for the credibility of an election. Everyone must be assured that one man has just one vote and that your vote will be counted. That is also why the institutions involved in the election process must be above doubt and totally independent.[10]

4 Elections in the Dutch polder and consensus democracy

Each country has different bodies that are involved in the electoral process. Particular examples are an Electoral Management Board, the legislator and executive bodies such as municipalities in the Netherlands. It is therefore relevant to note that all these bodies also have specific interests in the renewal of the electoral process. The Dutch

situation very much shows that these interests can sometimes be at odds with each other. For instance, relations between the Electoral Council and the Ministry of the Interior had gradually come under pressure since the abolition of voting machines. The Ministry was of the opinion that the Electoral Council was too hesitant and not sufficiently ambitious to take the lead in the renewal of the electoral process, in particular the development of a new, safer version of the supporting software. After all, it was also the Electoral Council that acted as the contracting authority for 'the first generation' of this software.

Around 2017, the Electoral Council held the view that, given the stricter requirements to be set on the new software, it would be better for the Ministry to take the initiative and bear responsibility. The software could then also be based on legal requirements yet to be developed. Moreover, only the legislator could make it compulsory for the software to be used in the calculation of the results. Furthermore, the Electoral Council believed that the increased complexity of designing and securing software would be beyond the knowledge available within its relatively small staff. It was said that the Ministry had more knowledge and experience available in areas such as software security or current cyber threats.

These difficult relations led to a deadlock in consultations, to growing irritation and frustration of the municipalities. After all, the logistical problems in the Netherlands mostly lie with the municipalities, which more and more believed that no one wanted to make an effort to relieve their problems. In the end, an independent mediator, a so called 'scout', had to be called in to break the deadlock and to outline a plan of action to work on these solutions. He delivered his opinion in February 2019. The opinion showed that there was consensus between the Ministry of the Interior, the Electoral Council and municipalities on the problem analysis and the tasks at hand. These were the following:

- Making a design and preparing for a tendering procedure for a new digital tool;
- Redesigning governance and reorganizing tasks and powers between the parties;
- Drawing up and implementing the necessary legislative amendments.

At the end of April 2019, these ambitions were laid down in an assignment that was given to an independent managing director, who began his work in mid-June 2019. As said, the central focus of his work was on modernizing the supporting software used to determine the results. The assignment was also to ensure a transition from Electoral Council to 'Electoral Authority'. This would not only make the Electoral Council responsible for the development, maintenance and management of digital tools in the electoral process, but would also create a hierarchy in the chain, the Electoral Council being granted far-reaching powers to monitor the desired quality. This hierarchy meant a breakthrough in the relations between the Ministry, municipalities and the Electoral Council existing in the Netherlands up to then. The strengthen-

ing of the role and powers of the Electoral Council in all elections meant an additional safeguard of the independence of elections. An additional advantage was that this would combine knowledge and experience.

Shortly after the managing director had taken office, it became clear that there was not enough time left to assume with certainty that 'reliable and tested new software would be available at the forthcoming parliamentary elections in March 2021. After all, a complete schedule of requirements had to be developed, followed by a public procurement procedure. Once this problem was identified, it was decided to develop a short-term strategy as well. The strategy consisted of a thorough update of the existing software, which tackles the current vulnerabilities. With a view to the elections to the House of Representatives in March 2021, a mandate was given at the beginning of 2020 to update the current Supporting Software for Elections (*Ondersteunende Software Verkiezingen*, OSV) to ensure that its use at the forthcoming parliamentary elections is still extremely credible and therefore justified. As the improvements are not expected to be sufficient in the long term (because of evolving hacking tools), work has also been done to develop and describe a new security concept and requirements for a completely new digital tool.

5   The role of cyber security

The importance of cyber security needs no explanation and that's why cyber security specialist were consulted. The involvement of the national security services has increased since the start of the programme to modernize the electoral process. For instance, they prepare a threat analysis and reviewed the security concept as well as the requirements to be set on the new software. This security concept is undergoing a number of major changes compared to the current software. So far, the Netherlands has been using software that is distributed to all municipalities. The municipalities install the software on their own computers, which may not have (or have had) an internet connection. This is not supervised or controlled in any manner whatsoever. In the new security concept, the software is managed centrally and a secure connection allows the various (also municipal) users to use the software. The use and network traffic are monitored centrally by a Security Operation Centre. So the concept changes from decentralized to centralized and from 'own responsibility' to 'central control'. It is proposed that the security concept be extended further with the creation of a second independent verification trail. Results of all polling stations are made available in digital form at one central location to allow citizens to check the allocation of seats themselves.

The proposed verification audit trail is off the upmost importance. The transparency in every step (from polling station via municipalities to the national level) secures the

trust of the public in the results (you can do your own check), but it also makes manipulation even more difficult. You have to infiltrate two systems instead of one! And because of this second trail there is no single point of failure. But – as often – it also has a downside. You could create confusion. Suppose the second trail leads to other results than the mean trail than one could argue that something is wrong and the results are manipulated. That is why also the verification trail must have a high level of cyber security. Moreover, in the Netherlands there is also a third (or better to say a first) audit trail: paper. The voting bills are secured and manual checks are always possible and will be taken.

6   From Electoral Council to Electoral Authority

In addition to the new IT, the role and responsibility of a new Electoral Authority is described. We want it to be an even more independent organization. For example: in the Netherlands the Electoral Council is financed by the Ministry and the Minister has to approve the results. The Authority will take over and strengthen the position and responsibilities of the Electoral Council. It is recorded how the Electoral Authority can determine that the election results are and will be credible. It will give an independent assessment of the credibility. Furthermore, there will come one commander. In the existing situation all executive parties (municipalities, districts and the election council) have an equal position. In the coming years there will be a hierarchy were the Authority can force executive parties in action. This demands that the roles of the various parties involved in the electoral process are described in detail. This has been done and these agreements form the basis for the legislation to be drawn up.

A new instrument e for the new Electoral Authority will be a report describing the course of the elections at the level of polling stations and municipalities. These facts and opinions are drawn up by an 'election coordinator' to be designated for each municipality, who can be compared with 'election officers' or 'returning officers' in some other countries. This report allows the Electoral Authority to decide to revise a result or require a recount. In turn, the Ministry will no longer draw up any regulations on the execution of elections. This role will also be assumed by the Electoral Authority. So this authority will be fully responsible for organizing and ensuring a reliable and credible course of these elections. The Authority will be given legal powers and means to do so. The secretariat of the Electoral Council will be expanded so that it can fulfil its new, larger role.

7   Failed at the last hurdle

After the rough start from the 2017 elections onwards, the implementation of the programme was speeded up in 2019. At the end of 2019, there was light at the end of the tunnel. Agreements had been made with the current supplier on a thorough update of the existing software. In addition, preparations for a tendering procedure for the development of completely new digital support were at an advanced stage. The plans for the other division of responsibilities in the electoral chain were also detailed. As in all other countries around the world, the Corona pandemic completely changed the situation in the early spring of 2020. Despite the drastically changed economic conditions and the severe strain this has put on public finances, the Ministry has made budget available for new electoral software and new governance. However, these funds are not sufficient for the full implementation of the proposed plans. As a result, it was necessary to decide to extend the useful life of the existing software, which, as already said, would be thoroughly adjusted. This would also entail additional costs, meaning that the financial viability of all long-term ambitions became uncertain. Given the partial cancellation of the promised funds and the impossibility to achieve all objectives of the programme within the scope of the original agreements, the managing director decided to resign as from June 2020. As a result, at the time of writing, the future of the programme is uncertain, or the programme is in any case delayed. However, it can be ascertained that all parties concerned have expressed and confirmed the will to successfully complete the programme. The usefulness and necessity of changes remain unabated.

8   Lessons for the future

The complexity of organizing and executing credible, secure and transparent elections has increased dramatically in a short time. Both from society and from various IT companies, there is pressure to rapidly digitize elections, whereas other experts, who are often also well-informed about the possibilities and limitations of IT, emphasize the risks. Furthermore with a 24/7 economy and all social media, the pressure to have fast, credible results increases and the citizens want it to be as easy as possible for them to vote.

All these tensions and risks are experienced differently in each country, which also means that they are addressed differently. In the Netherlands, the division of powers and responsibilities in elections between municipalities, the national government and the Electoral Council creates an additional complication. The necessary and inevitable renewal of the supporting software in the Netherlands has also been seized as an opportunity to improve cooperation in the chain, to strengthen the role and responsibility of the Electoral Council and to make the system of elections more resistant to un-

wanted interference. With so many different goals it is not strange that there were also many risks of failure. In this light, we have actually come a long way in the Netherlands. In the end, it was the Corona pandemic, which was unforeseeable until the beginning of 2020, which prevented the desired success.

Apart from the specific Dutch circumstances, there are the following, more general lessons for the future:
- developing a schedule of requirements for new election software is complex. It requires the use of specific expertise and therefore requires a lot of time and money;
- in this connection, the organization of a public tendering procedure for the actual development of that software is also complex;
- due to the increasing importance of securing the entire electoral process, an active role of national security services is becoming increasingly important, not to say inevitable; due to the involvement of various parties in the electoral chain, the overview and control of the entire chain, with all the requirements arising from legislation and regulations, the guarantee of a proper application of hardware and software and the protection against unwanted interference are becoming increasingly complex;
- an audit trail like our verification process is recommended. Trust and transparency are key for a democracy;

Based on our experience, we anticipate that maintaining and promoting a safe and credible organization and execution of elections, along with a well-considered and responsible use of digital tools, threatens to go beyond the knowledge and expertise of individual countries. We are aware that each country has its own system of elections, so the software has to be partly tailor-made for each country. But security concepts are the same. In a digital world cyber security is excellent or the software is not secured. And cyber security is more than bits and bytes. Organization, audit, transparency, back-up systems are part of a security concept. In view of the requirements to be imposed on parties interested in the development of the required software, increasingly fewer companies within Europe are able to do so. All in all, there is growing dependence on an increasingly limited number of commercial companies that will be able and willing to meet all requirements; That is why we want to call for more international cooperation, especially at a European level.[11] In pursuit of this, we envisage a European Centre of Expertise for elections, which could be tasked with the following activities:
- exchanging, pooling and enriching experience with elections;
- offering a platform to staff members of security services from different countries in order to exchange information about elections and threats to elections and to share knowledge about the security thereof;

- exchanging, pooling and enriching knowledge of and experience with digital support of elections;
- exchanging, pooling and sharing knowledge of the development and procurement of hardware and software for election purposes;
- and in time it can perhaps do the tendering and organise a purchasing power for the highest level of cyber security, an audit process and credible counting software.

Let's not do it on our one, let's work together. Cybercrime has no borders and the enemies of democracy in France are the same as in the Netherlands. Of course we know that there are existing platforms (i.e. the European Conference of Electoral Management Bodies organized by the Venice Commission), but these platforms are in our opinion without obligations. What we are suggesting is a permanent and more compelling organization.

It is conceivable to extend the tasks of such a centre of expertise to include, for example:
- developing basic components for election hardware and software that can be used in more than one country;
- supporting tendering procedures
- developing schedules of requirements for hardware and software to be used for elections.

It is time!

References

1. The views and opinions expressed in this article are those of the authors and do not necessarily reflects the opinion of the Electoral Council or the Ministry.
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4. See: P. Castenmiller and M. Bom. Digitizing the vote. In: Yearbook of the Association of Registrars, 2018; See also: A. Driza Maurer, Digital technologies in Elections, Questions, lessons learned, perspectives. Council of Europe, 2020.
5. This article can in some respects be seen as a follow-up to two articles that one of the authors published earlier on the use of digital technology in Dutch elections. These are: P. Castenmiller K. Uijl., The use of supporting software in elections, the peculiar case of the Netherlands 2017. In: R. Krimmer et al (eds.), Proceedings E-Vote-ID 2017, pages 315-325; P. Castenmiller and P. Young, Paper and digital: in search of 'the best of both worlds' in establishing the outcome of elections. In: Robert Krimmer et al (eds.), Proceedings E-Vote-ID 2018, pages 170 − 178
6. See: Kiesraad, Evaluatie-advies Tweede Kamerverkiezing 15 maart 2017, 2017

7. This course of affairs is described in: P. Castenmiller and K. Uijl, The use of 'supporting software' in elections, The peculiar case of the Netherlands 2017, see note 5.

8. For some years now, the legislator has been giving municipalities the opportunity, by way of experiment, to transfer the ballot papers from the polling station to a central location, where the votes are counted the next day.

9. As said, there are municipalities that participate in the experiment of central counting of votes on the day after the elections.

10. This is also laid down in the Recommendation of the Council of Europe on standards for E-voting (Recommendation CM/rec(2017)5).

11. We do not take a position on whether this should be done at the level of the European Community or another organization like the OSCE or Council of Europe.