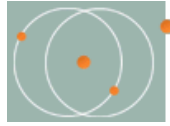


The Internet rights forum



www.foruminternet.org

RECOMMENDATION

WHAT IS THE FUTURE OF ELECTRONIC VOTING IN FRANCE?

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SUMMARY OF RECOMMENDATIONS

I. Principles for the rollout of electronic voting

The Internet rights forum believes that a number of principles should surround the rollout of electronic voting.

- **Electronic voting should be introduced, but in a gradual and reasoned manner.**
- The **public authorities must continue to be in charge of the design and operation of the polls that they are responsible for organising.**
- **Electronic distance voting must be possible where provision has been made for postal voting**, provided that the players in question are in favour of said means of voting.
- **Electronic distance voting must be designed as a supplementary voting procedure and should not exclude more traditional methods** in the name of the principle of voting equality for all citizens.
- For political elections, **the main electronic voting development phases must first be the subject of widescale public debate.**

II. The rollout of electronic voting must be gradual and reasoned

The Internet rights forum recommends that electronic voting should not be introduced in a uniform manner. Decisions should be taken on a poll by poll basis. The Forum recommends the following plan of action:

- For political elections:

Electronic distance voting should not be introduced. On the other hand, the Forum wishes **each voter to be able to vote at a voting kiosk in any polling station.**

- It should be possible to experiment with **electronic distance voting during local referendums.**
- It should be possible for **all French nationals abroad** to use **electronic distance voting for 'Conseil supérieur des Français de l'étranger' [Supreme council of French nationals abroad] elections.**
- **The State must undertake to bear the specific cost of electronic voting system equipment.**

- For 'prud'homale' elections ['prud'hombres' are nonprofessional magistrates who oversee contract disputes in a court system set up according to region and industry. Half of the delegates are nominated by labour unions and elected by workers, and the other half are nominated and voted upon by business owners]:

- **Voting at a voting kiosk in any polling station** must be introduced for **'prud'homale' elections.**
The Forum recommends that **electronic distance voting experiments** should be conducted during the next 'prud'homale' elections for the employers' board, and, indeed, for the management section of the employees' board.

- For ordinal and consular elections:
 - **Electronic distance voting** must be set up for **elections to professional orders, and chambers of commerce, industry, trade and agriculture**, subsequent to approval from the organisations in question.
- For professional elections:
 - In the private sector: **electronic distance voting or voting at a voting kiosk should be authorised**. To do this, it will be necessary to amend labour law provisions. The choice of voting procedure must be subject to prior agreement between management and labour.
 - In the public sector: **electronic distance voting should be authorised for elections inside public sector joint administration committees and joint technical committees**, subsequent to agreement between management and labour.
- For voting inside associations, general shareholders' meetings and for public service user consultations:
 - **The development of distance voting should be encouraged within associations and general shareholders' meetings**, in particular, by promoting exchanges of experience between players.
 - **Consultations and electronic distance voting should be developed for public service users**. This may initially be applied within the sector of school parent representative, or student representative, elections.

III. Electronic voting must be rolled out in accordance with a number of practical procedures

The introduction of electronic voting cannot be envisaged unless certain practical procedures are respected:

- **Electoral roll management must be modernised**. For this, the Forum recommends that **electoral rolls should be managed electronically in the form of a national voter file**.
- The level of **authentication** required must be **in proportion to the importance of the poll**. Thoughts regarding **voter authentication must be taken into account in the "Daily life card" and "electronic identity card" projects**.
- **Any system of electronic voting used for a public poll** must be subject to **technical approval** from the relevant ministry, granted on the basis of **specifications**. The specifications must adhere to the following rules:
 - **Strict separation** of the duties of the electoral roll manager and those of the electronic urn manager.
 - **Access to source code** by approved experts.
 - "A posteriori" **audit** of the voting system.
 - **Voting data** to be stored until expiry of deadlines for judicial appeals instead of reports being stored.

- **Voting system servers to be located** on national territory.

- Special electronic distance voting procedures:

- It must be possible for **electronic distance voting to take place over several days** and the deadline for voting electronically must be prior to the voting date at polling stations.
- **Electronic votes must be final votes.** Although taking place over several days, it must not be possible to modify the electronic vote once it has been cast. It must not, therefore, be possible for this vote to be substituted by a vote placed in the urn on the day of the election nor by a postal vote.
- **Electronic voting must be surrounded by a certain solemnity:** the vote cannot be made final until it has been confirmed twice by the voter who must always be entitled, provided that the vote has not been confirmed, to change his/her mind about the way he/she intends to vote.
- **The introduction of electronic voting must be accompanied by information and training initiatives.** Digital public spaces as well as National Education must encourage these initiatives devoted to information technology and citizenship training.

- **Electronic votes conducted for public polls** must be the subject of special **follow-up and evaluation procedures**. The Forum recommends the **creation, within the Agency for the development of electronic administration, of an electronic voting 'Observatory'**.

The Observatory would have the following duties:

- **To centralise information and lessons learnt from electronic voting experiments** and to conduct **international research**;
- To give **ministries the benefit of its expertise during the approval of voting systems**.
- To **evaluate electronic voting systems**.
- **To report on its activity** by means of publishing an annual report.

INTRODUCTION

Voting is a democracy's main means of expression. It exists in all spheres of society i.e. within associations and companies, between peers within the same profession and, of course, at a political level.

It seems that the development of information technologies will be able to change the face of voting and voting procedures. Although electronic voting has been in existence for many years now, in the form of the voting machine, the development of the internet has opened up a new field of expression by enabling distance voting. In this respect, the organisation of an internet vote, in Arizona, in March 2000, to appoint the democrat candidate for the presidential elections was, for some people, the start of a new form of democratic expression. Lots of countries, such as the United States, Belgium, Germany, the United Kingdom and even Estonia are experimenting with, or even legalising, electronic voting.

In addition to the anticipated management advantages linked to the introduction of electronic voting (instant analysis, lower costs etc.) there are arguments relating to greater simplicity and comfort for voters. Generally speaking, a renewed enthusiasm for citizenship is expected due to the introduction of information and communication technologies and the new forms of direct debate, expression and consultation that they make possible.

For all that, the introduction of electronic voting raises lots of questions. For some, polling security, confidentiality and sincerity are principles which seem to have been brought into question by electronic voting. Others stress the importance of economic factors caused by these new markets, the importance of which should not justify adoption without discussion of solutions adopted by other countries. Generally speaking, the specific nature of national cultures must be kept in mind since this may translate into different relationships with voting and its principles.

Having considered this contradictory understanding of voting, we must ask ourselves if France should follow the general trend which is in favour of electronic voting. Although two recent laws have just introduced the possibility of voting electronically for some elections, it is particularly important to conduct a critical analysis of the costs and benefits of electronic voting. Voting remains, in effect, a symbolic act, a ritual which lays the foundations for belonging to a social and political community. Any change in its procedures must, therefore, be reflected upon maturely, without excessive distrust or enthusiasm.

The Internet rights forum wanted to seize upon this question, thereby continuing with work already begun on electronic democracy within the scope of its August 2002 recommendation on the webcampaign. It set up a working party on 5 February 2003. The recommendation that follows was adopted on 22 September 2003 by the Forum's Steering committee.

Objectives and report plan

The aim of the working party was first of all to compile a report (I) on the advantages and risks of the various electronic voting methods. This consideration was, in particular, based on a critical analysis of the different experiments already conducted in France, as well as on an international comparison.

The working party also wanted to draw up an action plan (II) to be sent to public authorities and players involved in electronic voting. This plan aims at a gradual rollout of electronic voting for different polls.

Finally, the recommendation studies the practical, technical and legal procedures (III), that have to be respected for electronic voting to be introduced in a harmonious and secure manner.

Methodology used

So as to integrate all aspects of electronic voting, the working party was multidisciplinary i.e. made up of lawyers, technicians and sociologists representing government, users or even electronic voting companies.

The working party proceeded, in addition to its collective working sessions, to listen to certain figures selected for their knowledge and experience of the challenges relating to various electronic voting practices (representatives from the world of politics and the unions, users, technicians, foreign experts etc.). These hearings involved almost all the electronic voting experiments conducted in France over the last two years and more, which, in particular, enabled the group to assess the system's advantages and limitations.

At the same time as holding these hearings, the working party wished to obtain the opinion of net surfers and set up a discussion forum. This forum, set up in partnership with the e-public club, was held between March and June 2003, upon which date a summary of contributions was compiled (see appendix).

1. FINDINGS AND PROBLEMS

1.1. Electronic voting methods and the scope of the recommendation

1.1.1. Electronic voting methods

The notion of electronic voting can be understood in the widest sense. It could, for example, include electronic counting of ballot papers. The recommendation does not, however, tackle this aspect of electronic voting and only deals with the case where the voter votes in a dematerialised manner by electronic means. It does not, therefore, deal with analysis by barcode or ballot papers read using a scanner.

Electronic voting can use very different methods.

1. Voting at a voting kiosk inside the voter's polling station.

The voter votes from a terminal, the voting kiosk, inside his/her usual polling station. In principle, therefore, he/she no longer uses a paper voting slip. The system automatically counts the votes inside the polling station.

2. Voting at a voting kiosk in any polling station.

The voter must go to a polling station in order to be able to vote but he/she may go to any polling station within the territory. The voter's identity and his/her entry into the voting cubicle may, if necessary, be monitored by staff at the polling station. The system must, however, make it possible to check that the voter is properly authorised to vote. It must also, if necessary, transfer the information to the voter's usual polling station.

3. Voting at a voting kiosk not inside a polling station.

The voter votes using a machine that is positioned in a specific location but is not monitored by a polling station. And so it is possible to imagine voting at a terminal inside a shopping centre, a station or a post office.

4. Distance voting without the voter having to go to the polls.

Voting can take place anywhere at all. The voter may, therefore, vote from his/her home, his/her place of work or from any other point within the territory. The technologies used may be very different:

- internet voting from a computer
- voting by SMS (Short Message Service) on a mobile telephone
- voting by telephone using the telephone keypad
- voting by means of interactive television

This recommendation refers to electronic voting by means of these four methods.

1.1.2. The scope of the recommendation

This recommendation does not intend to limit itself to political voting and local or national elections or referendums.

Certainly, the political vote is the most sensitive and demands particular attention. For all that, there are other types of polls that may be affected by electronic voting:

- Professional elections within companies (works councils, employees' representatives) or within government
- 'prud'homale' elections

- consular elections
- elections within professional orders
- voting at general shareholders' meetings
- university elections
- professional elections within the civil service within joint administration committees and joint technical committees
- voting within associations

This recommendation has used the term 'public poll' for political and 'prud'homale' elections.

1.2. Advantages and risks linked to the introduction of electronic voting

1.2.1. Anticipated advantages of electronic voting

1.2.1.1. Advantages in terms of vote management

- Improved processing and analysis

In principle, the use of electronic voting means improved processing and analysis. It gives an exact count of votes cast. It means that the results from polling stations and at a central level can be obtained very rapidly. It means, therefore, gains in terms of mobilisation of personnel and voluntary workers.

- Limitation of errors relating to polls using paper votes and frauds

Electronic voting means that uncertainties relating to invalid votes (marked, torn, folded votes etc.) which can be found in the current system can be eliminated together with annoying multiple irregularities which are not always of a fraudulent nature.

Electronic voting also means that various frauds that may come to light during a paper ballot can be prevented (envelopes thrown away, urns jammed etc.).

- Blank votes can be counted

This advantage is in addition to the previous one. A blank vote is defined as a vote where the voter does not designate any candidate¹. During a paper vote, blank votes are counted as cancelled votes and cannot be distinguished from invalid ballot papers.

The question of knowing whether blank votes should be officially taken into consideration is, what's more, a matter for debate. For political elections, a recent bill was aimed at enabling² blank votes to be precisely defined and to be distinguished from invalid ballot papers. Nevertheless, some people believe that recognising a blank vote would be liable to falsify election logic due to the possibility of voters casting a vote of no confidence rather than a positive choice.

This democratic debate exceeds the aim of this recommendation. At this stage, it is only necessary to note that a decision to count blank votes would be facilitated by the introduction of electronic voting systems.

1.2.1.2. Advantages in terms of participation

¹ For political elections, this definition is given in article L.57-1 of electoral law. It is specified therein that voting using a voting machine enables "*blank votes to be recorded*".

² Bill for the recognition of blank votes in elections adopted by the National Assembly at first reading on 30 January 2003.

The main argument in favour of electronic voting away from the voter's polling station would lie in the growth in electoral participation. Three positive factors can be expected from the introduction of electronic distance voting:

- It would be possible to vote in places other than the polling station assigned to the voter and so would facilitate the act of voting. By doing so, voting would be more in line with recent lifestyle and work trends which have, in particular, been characterised by 'nomadism' and a growth in occupational mobility.
- It may facilitate voting for populations which may encounter difficulties in having to leave home in order to vote at their polling station i.e. this is the case for those living alone who are elderly or disabled.
- It may encourage young voters to participate since they are regular users of information technologies and will find this new way of voting a more modern participation tool, even if surveys so far have not shown that these voters would be more motivated if they had these tools at their disposal.

Of course, the low participation rate in some polls does not just relate to physical voting conditions and how hard it is to vote. Some voters have turned away from the polls, both political and social and professional, more due to distrust of their representatives or due to a lack of interest in what is at stake in the election than for practical reasons. Abstention may also be explained by social exclusion. In this respect, electronic voting would hardly be likely to have an impact on the participation of this population of voters and may even make voting more difficult for them.

For all that, the results of electronic voting experiments conducted in France within a private framework or alongside political elections seem to indicate a slight tendency towards a rise in participation (cf. part 1.3). The fact, however, that these experiments are dealing with smaller populations and are only based on volunteers voting without anything really being at stake (the poll only having consultative worth), prevents this finding from being strictly validated.

In France, the results of an experiment conducted on a significant sample, that of the vote for the CSFE [Supreme Council of French Nationals Abroad] (cf. 1.3.1.3.), demonstrated that the introduction of electronic voting slowed the drop in the rate of abstentions by stabilising electoral participation; although this could be seen in other wards that were comparable in terms of size and type of electorate.

In a country like the United Kingdom, the results of pilot elections in 2003 showed that it is difficult to draw clear and direct information regarding the relationship between electronic voting and electoral participation (cf. 1.3.1.4.).

For the moment, therefore, it is not possible, in the light of electronic voting experiments, to confirm that electronic voting increases participation or, conversely, that it has no effect on participation.

1.2.1.3. Advantages in terms of renewed enthusiasm for citizenship

- The modernisation of public life

Being able to vote electronically seems like a symbol of the modernisation of public life and corresponds to trends in a society that is more mobile and more demanding in respect of the services to be supplied by the authorities. It would support the expansion of information

technologies and their use by voters. It may seem normal, for voters who increasingly use information technologies in their daily lives, to be given this opportunity for voting in certain polls. Since it is possible to vote by SMS or by phone within the scope of game shows and reality TV programmes, it is tempting to think that the same opportunity should be offered for the organisation of some polls.

- The appearance of new forms of citizen participation

Electronic distance voting via internet would enable other forms of political involvement and interaction to be stimulated by giving voters a new means of exchanging their opinions. Voting may, therefore, be accompanied by the creation of new forms of citizen expression. It is possible to create debates and consultations around electronic voting (discussion forums, surveys or on-line public enquiries, virtual symposiums etc.³).

For some, the internet may enable voters to be consulted more frequently or, indeed, semi-permanently. It is, therefore, possible to imagine that a union would systematically consult its members by electronic means regarding agreements signed or positions taken. For others, distance voting confirms the role of the representative by reinforcing the representative nature of those who have been elected, who may, in this way, make sure, on a regular basis, that they are consistent with their voters.

In their analysis of trends in political practice in the digital age, Stephen Coleman et John Gotze⁴ draw the idea, from lots of European voting and on-line deliberation experiments, that only one model of deliberative democracy combining deliberation and voting practices may be likely to remedy European citizens' growing 'apathy'. In their eyes, therefore, electronic voting constitutes the first step towards the dissemination of consultation practices that do not necessarily have to take the form of an election but which would come to support and assist elected representatives in their daily tasks.

Electronic voting means, therefore, that democratic practices can be renewed by encouraging a form of direct democracy enabling citizens to act in a concrete and rapid fashion in public life.

Some do, however, believe that voters are weary of these new forms of participation and that the latter will lead to a desacralization of the very concept of voting (saturation of information, too frequent consultations etc.). Because of this, the act of wishing to encourage these forms of direct expression could affect the very principle of representative democracy.

1.2.2. Risks linked to the introduction of electronic voting

The risks vary according to the electronic voting method used.

1.2.2.1. Risks common to all electronic voting systems

- System security problems

Different electronic voting systems may be the subject of various forms of attack or fraud attempts, particularly when they are based on data centralisation.

Of course, as indicated above, voting using paper media is not exempt from fraud. The use of computers for electoral operations would, however, under certain circumstances, permit large-scale fraud by just a handful of fraudsters.

³ For example, Greece, which presided over the European Union from January to July 2003, asked net surfers to give their points of view on broad guidelines for European policy by means of multiple choice questionnaires (www.evot.eu2003.gr).

⁴ Stephen Coleman and John Gotze, *Bowling together. Online Public engagement in Policy Deliberation*. London, Handsard Society, 2002.

It is necessary to distinguish between two sets of circumstances:

1) When electronic voting is performed on isolated terminals, i.e. physically in voting kiosks inside polling stations, the risk is limited to denaturation of the voting system by 'a priori' local means. This mainly consists of the modification of all, or part, of the management and processing software:

- electoral lists
- voting documents
- ballot papers
- presentation of the results of the poll

This risk can be reduced, in particular, by checking the system used and by measures ensuring the integrity of the system during electoral operations.

2) The risks would appear to be greater when electronic voting involves the transfer of data by means of a network to a server centralising the results. The use of a network infrastructure opens the system up to other types of attack and fraud, especially if the architecture uses an internet-type open system. It may also enable a small number of individuals to falsify the result of the whole poll, something which would appear to be more difficult when the data is being handled by individual polling stations.

We can, therefore, distinguish between:

- Attacks upon the transmission system: breakdown in physical transmission media (cutting of cables or fibre optics), saturation of media by massive transmission of fictional data packets, malicious eavesdropping of data communications, pirate network connections.
- Attacks on servers: refusal of service consisting of unauthorised access to server functions, server access saturation (*flooding*^{5*}) by transmission of non compliant data packets (information packets are too large), takeover of machines enabling fraudsters to act as system administrators (*Trojan horse** type viruses).
- Attacks on polling stations: unauthorised assumption of identity (*spoofing**) enabling fraudsters to act in place of a voter or to multiply the latter's voting actions, diversion of electoral site access to another address where it becomes possible to capture the parameters entered by the voter, installation of 'malicious' commands or viruses enabling the poll to be controlled (capture or modification of parameters, diversion of transactions).

Nevertheless, it is necessary to specify that the risk of external attack on electronic voting systems varies according to the sensitivity of the poll. Consequently, the level of security inherent in an electronic voting system used for a major political election would have to differ from that used for an election within a professional order.

- Impairment of the sincerity of the vote and voting secrecy

Risks relating to manipulation of the meaning of suffrage would appear to be much greater with electronic voting than with paper voting.

When a ballot paper is placed in an urn, there are no intermediaries between the will of the voter and the expression of his/her vote. There is nothing to physically prevent the voter's ballot paper from being substituted or corrected (urn jamming) but the urn represents a guarantee of transparency since the process is visible to all.

On the other hand, electronic voting interposes an opaque computer system between the voter and his/her ballot paper. This sense of the existence of a "black box" that cannot be seen by

⁵ The technical terms used in this section, and which are more fully defined in the glossary, are followed by an asterisk.

the voter may engender distrust of the electronic voting system in some people who may doubt the fact that their choice of vote has really been taken into consideration without upstream denaturation by the voting system or has not been modified by ill-intentioned candidates.

Likewise, the use of an electronic voting system may enable the identity of the voter to be linked to the way that he/she has voted. There may, then, be fears that an ill-intentioned candidate or agent responsible for monitoring the vote, without talking about a third party hacking into the system, may link the voter's identity with his/her vote.

This risk appears to be excluded for traditional polls. The passage through the cubicle and the placing of the ballot paper in the urn seems to protect the voter against the risk of anyone knowing the way in which they are voting. This protection appears to be reduced when using computer systems.

1.2.2.2. Specific risks for electronic voting away from polling stations

- Pressure on voters

Voting inside a polling station is monitored by assessors and candidate representatives. This means that a watch can be kept to ensure that no pressure is placed on the voter when he/she places his/her ballot paper in the urn. The journey from the cubicle guarantees that the vote is secret. These principles, appearing as article 3 of the Constitution, article 3 of the first additional protocol to the European convention for the protection of human rights and fundamental freedoms and also appearing in the electoral law⁶, remain vital.

In the case, however, of electronic voting away from the polling station, these basic principles would appear to be less solidly guaranteed. It is more difficult to ensure the confidentiality of the vote and that no pressure has been brought to bear on the voter, either by his/her family entourage or within his work community or of any other kind.

The objection can, of course, be raised that voting in a cubicle does not exclude the existence of family or social pressures. It may also be thought that distance voters are able to shake off pressures, including for political elections, and that a voting procedure such as this does not harm the integrity of the poll. And so, audits conducted in the State of Geneva in Switzerland only reported, for the period 1995-2000 (generalised postal voting was introduced in January 1995), one single case of proven fraud out of 129,580 checks performed on 28 polls⁷.

It should also be noted that this risk of pressure is not restricted to electronic voting but extends to postal voting and voting by proxy. In the case of the latter, the voter entrusts another with the task of voting on his/her behalf. Likewise, within the scope of postal voting, pressure exerted at the time that the vote is expressed cannot be excluded; above all, when the pressure is exerted within a family or professional framework⁸.

Postal voting in France now applies to many votes outside of political elections. In addition, many European states use postal voting for political issues (Switzerland, Germany, Sweden, Finland, Norway etc.).

- The difficulty of ensuring the identification and authentication of the voter

⁶ Article L. 59 of electoral law: *'The poll shall be secret'*.

⁷ *'Controls relating to the integrity and probity of the exercising of generalised postal voting rights in the State of Geneva'*. Patrick Ascheri, Dir. Of the Voting and Elections Service, Department of Justice, Policing, Transport. 1st November 2000.

⁸ The 'European Commission for democracy through law' made public a 'Code of good practice in electoral matters' (Opinion no. 190/2002 of 19 October 2002). It is specified therein that postal voting, involving a certain number of 'difficulties' linked, in particular, to the 'increased risk of family voting' and to 'fraud', 'should only be allowed where the postal service is safe and reliable'.

Voting away from a polling station makes it more difficult to check the voter's identity. This function is, in fact, normally performed direct by polling station members when voters are ticked off the register of voters. Voting away from the polling station means that this physical check cannot be performed. It may, therefore, appear to the eyes of certain citizens, to be less secure.

- Voting rituals damaged

Passing before the urn, a privileged moment in community and social life and in life as a citizen, represents, both in the political and professional domain, a ritual that is deeply engrained in the republican tradition. Going to the polling station also marks a voluntary action on the part of the individual, demonstrating his/her involvement in the life of the society and the City and a solemn and public affirmation of his/her entitlement as a citizen. The existence of a polling station is not neutral. It brings together the electoral body at polling time.

Nevertheless, a questioning, in part, of the tradition of the cubicle, cannot be rejected 'a priori' in the name of the intangible nature of physical election procedures. For some elections, passing before the urn does not represent a strong symbolic moment and, in addition, for a whole section of the population who have deserted the urns, it is precisely this ritual that is being questioned. Furthermore, the idea cannot be dismissed that some opponents of distance voting also have it in their minds that voting at a polling station enables a form of collective pressure to be exerted, for example, by guaranteeing that certain voters are rallied.

- The risk of inequality between voters

Within the current context of the low take up of information and communication technologies by voters, electronic distance voting may appear to be the harbinger of inequality. In reality, not all voters have access to the technologies used and are not sufficiently skilled in the use of these tools. A large part of the population could, henceforth, be excluded 'de facto' from the poll. And so, distance voting by internet or by SMS may favour younger populations and the most privileged social classes who are the main users of information technologies.

It should, however, be noted that this fracture is bound to be reduced as information technology becomes more widespread throughout society and as individuals develop greater skills in using these tools.

What's more, this objection is only valid if the vote is performed solely by means of electronic distance voting. It cannot be applied to situations where electronic voting is only one method amongst many other more traditional voting methods.

1.2.3. The cost of electronic voting

Savings linked to the introduction of electronic voting are often presented as being an argument in favour of electronic voting. Savings in terms of staff and equipment that may be brought about by the almost instantaneous electronic processing and analysis of a poll or economies in terms of ballot papers are often promoted. The cost/benefit ratio of the introduction of electronic voting would, however, appear to be less clear-cut.

With regard to costs, it would appear to be difficult to precisely estimate the exact cost of an electronic poll. Added to the cost of investing in the hardware and software required for the introduction of an electronic voting system are the maintenance and depreciation costs of this equipment. Hidden costs that are difficult to measure quantitatively should also be added. These are the human costs of training polling station members and any staff taking part in voting organisation or procedures, as well as systems managers or even network operation costs.

Of course, these costs are variable depending on the voting procedure used. If all the votes are cast by means of distance voting, one part of the cost may be transferred to the user⁹. For example, if the vote is cast by internet, the voter has to use his/her own computer and connection. If the vote is cast using a voting machine, the investment in equipment is higher¹⁰. Likewise, these costs may be depreciated over several elections.

With regard to potential savings (cost of ballot papers in polling stations, human resource costs linked to operating polling stations, in particular, for vote counting), it should be realised that these only affect a small proportion of poll-related expenses, the main expenses being constituted by costs linked to voter information (putting propaganda into envelopes and sending it out) and to the very existence of polling stations.

By way of example, for presidential elections, the cost of sending out candidate's official propaganda amounts to 35% of total expenditure and operating costs amount to 13%, 8% of which goes on electoral meeting costs. Savings relating to a reduction in the number of ballot papers in polling stations and accelerated processing and analysis are, therefore, only a tiny part of these electoral meeting costs.

Two factors may, nevertheless, increase savings relating to the introduction of electronic voting.

Firstly, it is possible to imagine that electronic distance voting may entirely replace traditional urn voting which would drastically reduce costs relating to traditional polling stations.

But, above all, it is possible to envisage official propaganda being sent electronically to the various voters. In this event, the cost of the election could be dramatically reduced.

For all that, it would not appear that these two developments can be envisaged in the near future for public polls (political or 'prud'homale' elections). Replacement of the traditional voting system appears to be difficult to envisage due to limitations in terms of equipping and training voters.

In addition, sending propaganda by electronic means runs into difficulties in terms of equipment and frequent changes of e-mail address.

In short, it would appear that the introduction of electronic voting does not allow substantial savings to be made with regard to the operation of the poll for most elections. It will, on the other hand, represent an additional initial cost.

1.3. Initial assessments of electronic voting experiments

The Internet rights forum's working party held a certain number of hearings. In particular, these hearings enabled the advantages and the limitations of the different electronic voting experiments conducted in France over the last two years and more, to be assessed.

These experiments varied in size i.e. they related to political and professional polls and even local consultations. In the case of political polls, these were conducted alongside the real polls and without prejudice to traditional voting operations which are the only ones recognised by law.

⁹ According to the election service provider, the cost of electronic voting for French nationals abroad was EUR 61,000 i.e. one Euro per registered voter.

¹⁰ The basic cost of a voting machine, without connection, is approximately EUR 2,000.

1.3.1. Experiments with electronic voting for political polls

1.3.1.1. Experiments conducted in Vandoeuvre-lès-Nancy (Meurthe-et-Moselle)

- Type of electronic voting used: both experiments were based on the principle of the voting kiosk inside the voter's polling station. Two types of techniques were, however, used:

1. Network voting within the polling station (this took place during the presidential election (21 April and 5 May 2002).
2. Voting using a smart card bearing voters' fingerprints (legislative elections in June 2002).

It should be remembered that the town of Vandoeuvre-lès-Nancy had, initially, expressed a desire to experiment with distance voting without the voter having to go to the polls (internet voting). The CNIL [French national commission for information technology and civil liberties]¹¹ was not in favour of distance voting, for four main reasons:

- Sending an access code and password by ordinary mail to a dwelling where several voters may reside does not guarantee that one voter is not voting several times by using access codes and passwords belonging to other people in the house;
- The opportunity of voting from home is likely to adversely affect voting secrecy and sincerity since the vote is not invested with the personalisation which it is due and since it does not guarantee that the vote is free of all influence and pressure.
- Servers handling personal data (electoral roll, register of voters etc.) were in New York and so were beyond any effective control from the national authorities.
- The technical mechanism was unable to guarantee the anonymity of the vote throughout the operation.

And so, the town of Vandoeuvre-lès-Nancy set up electronic voting experiments where voters were obliged to go to the polls (voting kiosks).

- Gains and advantages recorded with the introduction of electronic voting.

- Participation was quite sizeable for both voting techniques used¹².
- Subsequent to the experiment conducted during the presidential poll, a satisfaction survey was carried out by the 'mairie' [local council] on 80% of voters who had voted electronically. The findings showed that 66% of this sample was in favour of electronic voting but also that 50% feared that the computer system could be hacked into and that this type of vote would exclude certain categories of people.
- The town of Vandoeuvre-lès-Nancy subsequently used the internet to propose that the town's primary and secondary school children should take part, on-line (by means of voting) in a consultation regarding the slogan for the 2003 anti-smoking campaign. Under these circumstances, the internet enables new forms of public expression and a new way of consulting the town's inhabitants to emerge.

- Lessons learnt from the experiment, and limitations.

- With regard to voting by smart card: difficulties linked to identification by means of fingerprint (difficulties in appropriate positioning of the index finger, any cuts or wounds preventing absolute recognition etc.) and too much time taken up in preparing the card

¹¹ Decision no. 02-222 of 2 April 2002.

¹² With regard to the experiment conducted during the presidential election: the device involved one polling station in the first round (with three terminals) and three in the second round (six terminals). In the first round: out of 1,280 voters registered at that station, 820 turned out to vote and 468 of these experimented with internet voting. In the second round: out of 2,181 voters registered at the three stations, 1,720 voted traditionally and 917 of these also voted by internet.

With regard to the experiment conducted during legislative elections: the device involved one polling station (871 registered voters). Out of 597 who voted, 244 people experimented in the first round and out of 563 who voted, 225 experimented in the second round.

(fingerprints etc.), since the advantage of electronic voting fundamentally lies in the speed of the procedure.

- With regard to network voting: fears that the computer system could be hacked into and that this type of vote would exclude certain categories of people (cf. aforementioned satisfaction survey).

1.3.1.2. The experiment conducted in Voisins-le-Bretonneux (Yvelines)

- Type of electronic voting used: voting at a voting kiosk inside the voter's polling station by means of the internet during municipal and cantonal elections in March 2001

- Gains and advantages recorded with the implementation of electronic voting.

- Participation was sizeable¹³ and voting did not lead to any breakdown of equality in terms of access to the internet tool. On the contrary, all age groups voted in an almost uniform manner.

- Lessons learnt from the experiment, and limitations.

- Voting operations advanced too slowly and were quickly saturated (too few voting points being available and a problem with bandwidth sharing on the 'mairie' cable network was noted).

1.3.1.3. Electronic voting experiments subsequent to the law authorising voting by e-mail for French nationals abroad for 'Conseil Supérieur des Français de l'Étranger' (CSFE) elections.

- Type of electronic voting used: distance voting without the voter having to go to the polls made possible by a law aiming to authorise e-mail voting for French nationals abroad for CSFE elections¹⁴ (28 March 2003). The poll took place from the 19 to the 31 May 2003.

It should be noted that voting for the CSFE is the only election by means of universal suffrage where the law authorises voting by e-mail.

Experiments have been carried out in the United States with electronic voting because:

1. The internet network is highly developed there,
2. French nationals who live there have a strong internet culture,
3. The participation rate is particularly low there and is dropping steadily.

- Gains and advantages noted with the introduction of electronic voting.

- Although electoral participation only increased by 2.5 points compared with 1997, this result was considered to be a relative success in terms of participation¹⁵. This rate was also explained by a massive influx of new registrations in consulates following the events of September 2001, the electoral roll rising from 50,000 to 61,000 people in just a few months. It should, however, be noted, by way of comparison, that in Canada, a country where people traditionally vote more and where 'paper' elections for CSFE representatives were also conducted at the same time in neighbouring wards, the participation rate dropped (down from 21.1% in 1997 to 14.7% in 2002).
- Polling station personnel were able to manage the opening of electronic urns and decode the votes, without any special training.

¹³ For the municipal elections, out of the 1,511 voters registered, 946 voted traditionally (i.e. 62%) 276 of whom voted via the internet (i.e. 18%). For the cantonal elections: 914 voters voted traditionally (61%) 236 of whom voted via the internet (16%).

¹⁴ Law no. 2003-277 of 28 March 2003 to authorise voting by e-mail for French nationals abroad for 'Conseil Supérieur des Français de l'Étranger' elections (appearing in [JO n° 75 du 29 Mars 2003](#)).

¹⁵ Out of the 61,000 voters registered in the two American wards, 8,800 voted (i.e. a participation rate of 14.47%). 60.6% of voters voted by internet (5,354 voters, i.e. 8.77% of those registered), 33.84% of voters voted by post (2,989 voters, i.e. 4.90% of those registered) and 5.6% turned up to vote at the 11 polling stations (491 voters, i.e. 0.8% of those registered).

- The limitations of electronic voting.

- The question of the role that the service provider has to play in storing voting data has been raised. In fact, the contents of the voting database, which has to be stored for the duration of the appeal time, was archived by a private service provider whilst for traditional polls, documents are stored by the relevant administrative department.

1.3.1.4. Some experiments with electronic voting abroad

Brazil, Belgium and even the United Kingdom have implemented various electronic voting procedures for elections of a political nature.

For the time being, it is not possible, in the light of electronic voting experiments, to confirm that electronic voting increases participation or, conversely, that it has no effect on participation.

Brazil is a country that is highly advanced in its use of electronic voting. In the elections held in October 2000, 109 million voters voted using this system. The introduction of electronic voting aimed to eliminate electoral fraud, to reduce counting times and simplify voting procedures for the illiterate (nearly 20% of the population). The system used was that of the electronic urn with a digital keypad.

The Brazil example has shown that the introduction of voting machines drastically reduces the number of invalid votes and that this was much greater than the effect on participation. This seems to be due to the fact that the machines made the multiple votes that each voter has to cast during elections (as in the United States, Brazilian voters vote on the same day for different polls i.e. local, federal state and federal elections) much easier to understand and warned voters of the logical errors that they were likely to make.

Belgium is a pioneering European country in terms of the use of electronic voting systems. Electronic voting experiments were conducted as early as 1985. Electronic voting in Belgium is governed by the law of 11 April 1994, amended by the law of 12 August 2000. The relatively high cost of this mechanism has prevented the system from being introduced in a generalised fashion throughout Belgium (50% of wards are involved, i.e. nearly four million voters).

The method adopted was that of voting at a voting machine. The voter identifies himself by means of a magnetic card on which data are recorded using a screen on which the options that can be selected with an optical pencil are displayed. In the last municipal elections, the system was used by 44% of the voters involved. Despite a bill being filed¹⁶, in April 2000, for the authorisation of internet voting, this voting method still does not seem to be on the agenda. In fact, in May 2001, the Senate Internal Committee adopted a recommendation freezing the development of electronic voting.

Because of this, only **the United Kingdom** offers any real field of study for electronic distance voting. In fact, since 2002, and for a three year period, widescale electronic voting experiments have been introduced.

Experiments have been conducted using all methods of electronic voting. This has included voting kiosks in the voter's polling station as well as those located away from polling stations (such as, for example, in shopping centres or stations), or even distance voting (i.e. by SMS, or by internet from personal computers, or by interactive television)¹⁷.

¹⁶ Bill proposed by senators Destexhe and Van Quickenborne on 20 April 2000 'supplementing the law of 11 April 1994 organising automated voting with a view to allowing automated distance voting'.

¹⁷ In particular, in Liverpool, Sheffield, Saint Albans, Somerset, Ipswich, Norwich etc.

Although the results of the pilot elections in 2003 were technically satisfactory, it is difficult to draw clear and direct information from them regarding the relationship between electronic voting and electoral participation.

In some cities, a slight increase in participation was clearly observed, but it is difficult to attribute this just to electronic voting. Lots of other factors could have played a part i.e. simplified registration procedures, extension of polling time, media promotion (lots of advertisements and promotions were used for these voting systems), local factors that may have affected individual polls, novelty effect for places experimenting with e-voting for the first time (South Somerset and Shrewsbury & Atcham witnessed their participation rates rise dramatically i.e. +9.3% and +11.8% respectively).

With regard to this last point, it is necessary to make a comparison with places that had already experimented with electronic voting in 2002. For example, South Tyneside and Chorley witnessed their participation rates drop (- 8.7% and - 12.2% respectively).

Generally speaking, it should be noted that in places where distance voting alone was offered (internet, telephone, SMS or even interactive television), no increased in participation was recorded. Out of the six locations experimenting with these voting methods, only one recorded a rise in participation (the city of Norwich: + 1.4%).

At the same time, the four locations that only offered voting at a voting kiosk inside the voter's polling station also witnessed their participation rate drop (with the exception of Basingstoke & Deane, with a rise of + 2.6%).

1.3.2. Experiments with electronic voting for local consultations

1.3.2.1. The experiment conducted in Issy-les-Moulineaux (Hauts-de-Seine)

- Type of electronic voting used: distance voting without the voter having to go to the polls (internet voting) for the appointment of neighbourhood council members (November 2002). This experiment was authorised by the CNIL in its decision of 28 November 2002.
- Gains and advantages recorded with the introduction of electronic voting.
 - The experiment was able to show that distance voting without the voter having to go to the polls is possible in practical terms.
- Lessons learnt from the experiment, and limitations.
 - The participation rate was low¹⁸. This was linked both to what was at stake in the poll, the complication of issuing voting codes, and to the appearance of technical problems:
 - The CNIL gave a negative opinion regarding experimentation with an electronic voting mechanism using the internet during 'prud'homale' elections¹⁹ and so the experiment witnessed its scope being restricted to an election of little importance where voting methods were left up to the relevant authority.

¹⁸ Out of the 1,449 people who were registered to take part in the vote, 939 obtained their confidential code and 860 people actually voted.

¹⁹ Decision no. 02-91 of 28 November 2002 relating to the request for an opinion submitted by the Issy-les-Moulineaux 'mairie' regarding experimentation with an electronic mechanism using the internet during 'prud'homale' elections stated that 'the guarantee of voting secrecy constitutes a fundamental principle that only the personal and anonymous nature of the vote, the reliability of electoral operations, effective monitoring of the poll and 'a posteriori' checking by the election judge can provide. (...) The Commission considers, in this respect, that this mechanism's operating procedures, as described in the request for an opinion, do not provide, in their current state, the assurance that this procedure effectively guarantees voting secrecy and, in particular, prevents scrutineers or system administrators from knowing the way in which any given voter has voted, the Issy-les-Moulineaux mairie itself admitting that the 'Cybervote project, in its current form, does not guarantee a high level of confidentiality in respect of the files used'.

- Technical problems appeared (slow downloading of the voting software required and incompatibility of the voting system with MacIntosh computers). Differences between the equipment available in different households and risks of a digital divide should be taken into consideration. Because of this, whether or not voters possessed PCs with broadband connection affected the success of the vote.

1.3.2.2. The experiment conducted in Orsay (Essonne)

- Type of electronic voting used: voting at a voting kiosk inside the voter's polling station (voting using a smart card with a built-in personalised electronic certificate) relating to questions of local and European interest. Voting took place in two stages and was spread out between Wednesday and Saturday. The first stage took place between 26 February and 1 March 2003. Voters had to give their opinion on a question of local interest concerning the enlargement of the metropolitan area. The second stage took place between 19 and 22 March 2003. The question raised involved the oil shortage with which Europe will be faced in several years time and the energy solutions to be implemented.

- Gains and advantages recorded with the introduction of electronic voting.

- The experiment encouraged some modernisation of public life since community agents responsible for the elections, being discharged of their physical tasks, demonstrated their satisfaction and desire to develop these practices.
- The voting system proposed functioned in satisfactory manner

- Lessons learnt from the experiment, and limitations.

- Participation was low²⁰
- Voting using a smart card, chosen, in particular, for reasons of voter authentication, costs more than other types of electronic voting. For financial reasons and despite a great influx volunteers, the number of electronic certificates and smart cards issued had to be limited to 9.4% of the population registered on the electoral roll.
- The frequency of the polls (two votes in less than a month) resulted in much higher abstention levels for the second poll.

1.3.3. Experiments with electronic voting within professional orders and associations.

1.3.3.1. Electronic voting used by the French national bar council

- Types of electronic voting used: voting at a voting kiosk inside the voter's polling station and distance voting without the voter having to go to the polls (internet voting) for the National bar council (25 and 26 November 2002) made possible by a decree instituting distance voting by electronic means for the election of members of the National bar council.²¹

- Gains and advantages recorded with the introduction of electronic voting.

- High participation levels²² reinforcing the legitimacy of the Order,
- Simplicity and smooth operation of the system. There were very few technical problems during voting; the assistance standard set up only received 150 calls. These related to difficulties due to lack of knowledge of the system or the fact that access providers were blocking secure access to the voting site
- Immediate results.

²⁰ The experiment involved 925 voters, i.e. 9.4% of the population registered on the electoral roll. The first vote brought together 682 voters. The second vote brought together 454.

²¹ Decree no. 2002-1306 of 28 October 2002 amending decree no. 91-1197 of 27 November 1991 organising the profession of Legal Counsel.

²² The usual participation rate was doubled i.e. out of the 16,000 barristers registered to vote on the Paris Law Society's electoral rolls, 9,400 took part in this poll. 70% of voters voted by internet.

- Lessons learnt with regard to the use of electronic voting by a professional order.
 - Introduction of electronic voting gave rise to two appeals that were thrown out by the Paris 'Cour d'appel' [appeal court] (orders dated 19 December 2002).
 - 1) The first maintained that the election of the Order's council members could only take place within the scope of a general meeting involving the physical presence of members all in the same place. The 'Cour d'appel' thought that a general meeting could be held electronically if the amended by-laws permitted this type of dematerialised voting and that this election did not require the physical presence of each voter in the same place.
 - 2) The second maintained that there was a risk of double votes appearing or of voting by persons not authorised to vote. The 'Cour d'appel' judged that a risk such as this, in this election, would be prevented by technical monitoring procedures used by service providers.
 - Internet voting was of more interest to young barristers (voting rate of around 80%) than to older ones (voting rate of approximately 50%).
 - Although voting solely by means of the internet is technically possible, the National bar council does not envisage complete substitution, in the immediate future, due to the symbolic value linked to the paper vote.

1.3.3.2. Electronic voting during the Founding congress for the 'Union pour un Mouvement Populaire' [Union for a Popular Movement] (UMP).

- Types of electronic voting used: voting at a voting kiosk inside polling stations, away from polling stations and distance voting without the voter having to go to the polls (internet voting) to appoint a management team and ratify the articles of association of the 'Union pour un Mouvement Populaire' (11 to 17 November 2002).

It should be noted that electronic voting alone was open to 164,000 members, traditional voting not being authorised.

- Gains and advantages recorded with the introduction of electronic voting.
 - High level of participation²³
 - Modernisation of public life and of a political party (the UMP has now built a voting identifier code into each membership card).
 - The home voting system has proved to be user-friendly, enabling groups of 'specialist' friends to get together and other groups to be started.
- Lessons learnt from electronic voting, and limitations.
 - A technical problem arose i.e. temporary crashing of the intranet resulted in a ten minute delay in the processing and analysis of results.
 - Voting from home resulted in voting by 'communities of kindred spirits' without any real voting secrecy.

1.3.4. Experiments with electronic voting for professional polls

1.3.4.1. Electronic voting for elections for the works committee and for trades union representatives within the e-Laser company

- Type of electronic voting used: distance voting without the voter going to the polls for election to the works committee and for employee representatives within the e-Laser company (July 2001).

²³ Out of 164,000 members, 48,000 voted according to the following breakdown:

- 1) 23,000 voted from their home or workplace.
- 2) 18,000 voted from a departmental internet polling station.
- 3) 7,000 voted on the day of the Congress in Bourget.

- Gains and advantages noted with the introduction of electronic voting.
 - Immediate processing and analysis
 - Positive image of a company equipped with modern communication tools.
- Lessons learnt from the experiment, and limitations.
 - No rise in participation rates
 - The end of the electoral ambience that can only be achieved with a traditional paper vote.
 - Given these lessons, it was thought preferable to reinstate a polling station for the next polls conducted via the internet during professional elections.

1.3.4.2. Electronic voting organised within Foreign affairs department information and communication systems attaché corps

- Type of electronic voting used: distance voting without the voter having to go to the polls and voting at a kiosk inside polling stations for the election of Foreign affairs department information and communication systems attaché corps (ASIC) employee representatives, made possible by a ministerial order issued on 11 February 2003 permitting the use of electronic voting.

Distance voting was spread out over a week (17 to 24 March 2003). An electronic terminal was also installed inside the paper vote polling station where the vote took place on 24 March 2003.

Prior existence of postal voting for this type of election should be noted.

- Gains and advantages recorded with introduction of electronic voting.
 - High level of participation²⁴
 - No technical hitches on the on-line voting side, immediate processing and analysis.
 - Voters who voted by internet all demonstrated their satisfaction in respect of use of this voting system.
- Lessons learnt from electronic voting, and limitations.
 - Paradoxically, the majority of voters based abroad voted by paper postal vote. In fact, some attachés seem to have been worried about the reliability of the system and preferred to cast a postal vote for fear of not being able to vote.
 - The location of the server was discussed. The service provider positioned the server in the United States. Some voters thought that the server should have been in France and wanted the server's location to be clearly specified prior to the introduction of electronic voting.
 - Electronic checking of the register of voters was not possible due to uncertainty as to polling station opening and closing hours. Checking had to be done over the phone to prevent any double voting.
 - Some voters said that they had reservations about the fact that it was the service provider direct who printed and sent out the codes and passwords. The service provider did, however, assert that more secure procedures would have had an impact on election costs.
 - It was not possible for some voters to gain access to the vote due to the fact that their navigator was too old and did not support the voting system's security levels.

²⁴ Participation rose by 20% in comparison with the previous poll i.e. 67 attachés were entitled to vote, 50 cast a vote. The total number of paper voters was 29 (23 postal votes and 6 votes at the urn). 21 voters voted electronically.

2. PRINCIPLES AND PLAN OF ACTION FOR THE ROLLOUT OF ELECTRONIC VOTING

2.1. Electronic voting rollout principles

2.1.1. Plan for gradual electronic voting rollout

The Internet rights forum believes that electronic voting rollout must be encouraged so as to take into consideration the growing presence of information and communication technologies in most citizens' activities as well as the undeniable contribution made by electronic vote counting and management.

This rollout must, however, take the cultural, social or even geographical specificities of a country like France into account. **The Forum believes, therefore, that it would be illusory, given the current state of techniques and the perceptions of the electoral body, to recommend the rollout of electronic distance voting for all polls, in particular, for elections of a political nature.**

Electronic voting must not, therefore, be implemented in a uniform manner but introduced gradually, with decisions being taken on a poll by poll basis.

All votes are not, in fact, the same in terms of what is at stake, the sensitive nature of the issues being voted on, their symbolic weight or the abstention rate. A poll taken inside an association is not comparable to a presidential election. The practical procedures and security levels involved will have to be very different.

We must, therefore, be careful not to impose identical requirements for all polls. Each type of vote requires a particular approach so as to determine whether or not it is possible to use some form of electronic voting and so as to determine the specifications that are desirable in terms of organisation and voting security.

For public polls, it is up to public authorities to define these rules. In other situations, these rules have to be defined by the private players directly involved in the election, since they may have different understandings of the risks.

The Forum recommends that this **rollout should be conducted gradually on the basis of lessons learnt from different experiments.**

The use of electronic voting in some polls must, therefore, be evaluated so as to determine the lessons that can be learnt for other types of polls.

2.1.2. Public authorities to retain their role for public polls

The Internet rights forums wishes public authorities to continue to be in charge of the design and operation of the polls that it is responsible for organising.

The unavoidable changes in concrete means of expressing votes that have accompanied changes in French society, must not lead us to forget that the organisation and management of public polls (political, 'prud'homale' and consular elections) expressly relate to the challenges of public power i.e. an expression of national sovereignty and how justice and the economy are organised.

Consequently, a public service relating to the organisation and guiding principles for the operation of public polls, is a public service that appertains to the royal prerogative and is just as fundamental as law and order or justice and cannot, on principle, be the subject of withdrawal, nor of delegation to private players.

Relations between public authorities and private service providers must, therefore, under all circumstances, ensure that strategic choices, including those with a major technical impact, are a matter either for unilateral acts of public power, or for the distribution of basic service provisions by means of public tenders in accordance with competition regulations. The State must also check that the technical solutions proposed do not have the effect of disregarding the electoral rules and practices laid down by the legislator and by Republican tradition.

As reiterated by the French Council of State in a public opinion issued on 7 February 1995²⁵, **an electronic voting system used for a public vote must subject to technical approval on the part of the relevant ministry, issued on the basis of specifications.**

The principle of the technical approval is of primary importance, since it guarantees that no provider of computer services can be accepted to manage the electoral roll and voting operations unless its voting system adheres, at each stage, to the principles considered to be fundamental by the State in terms of guaranteeing the sincerity of the vote. The declaration to the CNIL (cf. 3.1.1.) is in keeping with this objective by enabling it to check the conformity of the voting system in relation to personal data protection principles.

The Forum believes that it is vital that the specifications should contain clauses intended to ensure the effective guarantee of adherence to the poll's fundamental principles and rules. The Forum, in particular, believes that the specifications should contain a certain number of requirements, details of which are given in part 3.1.3.

2.1.3. Allowing electronic distance voting when postal voting is already in existence

There is no reason why provision should not be made for the possibility of electronic distance voting from home or from the workplace where provision has been made for the routine alternative of postal voting. In fact, electronic distance voting, in principle, does not appear to be any less secure than postal voting. Postal voting is liable to many of the criticisms made by opponents of electronic distance voting,

Postal voting also relies on sending the voter material that enables him/her to vote by post. Since the voter is not at a dedicated voting site and is not subject to any particular supervision, there is nothing to stop pressures from being placed upon him/her.

In the same way, voter authentication does not appear to be any more guaranteed by postal voting.

Of course, some postal elections provide for a form of monitoring by requiring the voter's signature to appear on the envelope. In addition, however, to the fact that this is not a general requirement, it is often no more than a formality since the signature cannot be compared to the voter's actual signature by the polling station.

In short, where postal voting is already in existence, objections that electronic voting would constitute symbolic damage in respect of the voting process, could not be made.

Electronic distance voting would appear to be a new means of postal voting with added advantages in terms of processing and analysis.

Of course, electronic voting involves specific risks, as we have mentioned above. These risks do, however, appear to be technically controllable provided that system security is adequate²⁶. Postal voting also involves its own set of risks, in particular, with regard to fraud.

²⁵ Opinion no. 357 182. 'Section de l'Intérieur' [department of the interior] 7 February 1995, *EDCE* Public report 1995. no.47. p. 112

The Internet rights forum believes, therefore, that it should be possible to vote by means of electronic distance voting where provision has been made for postal voting, should the main players involved in the election so wish.

2.1.4. Envisaging electronic distance voting as an additional method of voting

Electronic voting inside a polling station does not raise problems with regard to the principle of voting equality. In fact, all voters can access the voting kiosk.

The introduction of electronic distance voting raises more problems due to disparities in terms of voters' equipment and the degree to which they have taken new technologies on board.

Electronic distance voting cannot replace traditional voting at the urn unless all voters possess the equipment required in order to take part in the vote.

In addition to these equipment-related problems, it is also necessary for voters to be fully competent in the operation of these tools in order to take part in the poll.

For the large majority of polls, these two restrictions prevent us from envisaging straightforward replacement of physical voting methods, either by means of votes cast inside a polling station, or by postal voting, with electronic voting. As things stand, such a replacement can only be envisaged for restricted polls where all voters possess the equipment and sufficient technological know-how to vote by means of electronic distance voting (net surfer associations, companies where all employees are connected to a network etc.).

The Internet rights forum believes, therefore, that the principle of voting equality means that electronic distance voting should only be thought of as one means of voting, as an additional method that does not exclude more traditional methods.

2.1.5. Organising electronic voting around the main players in the election

Since the rollout of electronic voting involves all voters, it is up to them to fix the objectives relating to its development and to equip themselves with the means of guaranteeing reliable conditions.

It is, therefore, necessary to leave the choice of voting procedure, depending on the type of vote, up to the players involved, by bringing them together upstream of the decision-making process. Some polls of a non-sensitive nature may, therefore, be the subject of distance voting provided that this is the wish of the players involved.

For elections of a political nature, in so far as there is an impact on the democratic process, **the Forum believes that the main phases of the development of electronic voting must be subject to previous widespread public debate.**

2.2. The action plan for the rollout of electronic voting

The Internet rights forum believes that electronic voting must be introduced in a gradual and reasoned manner, on a poll by poll basis.

From this perspective, the Internet rights forum recommends the following action plan:

²⁶ In this respect, the European Commission for democracy through law (cf. aforementioned) believes that electronic voting may be used if the system is 'secure – it can withstand deliberate attacks – and reliable – it works whatever the shortcomings in terms of software or hardware. (...) In addition, the voter must be able to obtain confirmation of his/her vote (...) and the transparency of the system must be guaranteed, in the sense that correct operation can be verified'.

2.2.1. For political elections

2.2.1.1. Electronic distance voting should not be introduced but electronic voting at a voting kiosk in any polling station should be authorised

From lots of different perspectives, political elections would appear to be a specific case.

Unlike other States (Germany, United Kingdom, Switzerland), postal voting for political elections has not been authorised since the law of 31 December 1975. The ritual of voting at the urn appears to be very firmly fixed in citizens' minds, voting secrecy being a basic principle of this ritual. Because of this, it does not seem that not going to the polls is likely to be easily accepted whilst this option is still a possibility.

For all that, the existence and development of postal voting abroad may justify a debate on our voting traditions. **The Forum believes, in fact, that in-depth consideration of a paper postal vote in political elections cannot be excluded and that it may be necessary to conduct a widespread debate on this topic.**

For all that, at this stage, **the Internet rights forum does not recommend electronic distance voting for political elections.**

On the other hand, the Forum recommends the introduction of electronic voting at a voting kiosk in any polling station.

This solution would appear to be more easily controllable in terms of system security, provided that the vote is cast on a private network. This would meet the expectations of more mobile voters who may be away from home on the day of the poll but may still be able to access a polling station.

The French ministry for the interior recently launched a debate on the use of electronic urns. Electoral law does, in effect, provide for the possibility of using voting machines inside polling stations²⁷. In the past, experiments with voting machines have not met with a great deal of success²⁸.

The emergence of electronic voting requires investment in a new generation of computers to enable voting from any polling station.

This change may require electoral law to specify that the voter may vote in a polling station other than his/her usual polling station. This would also require electronic management of the electoral roll in the form of a national voter file (see 2.3.2.).

It will require investment on the part of the State to contribute towards equipping the 'mairies' and towards the cost of the means of transferring data from polling stations to central servers.

Subsidies for electoral equipment (urns) are currently paid to 'communes' on a fixed rate basis. **The Internet rights forum recommends that the State should undertake to bear the specific cost of electronic voting system equipment** either direct, or by means of reimbursements or additional subsidies given to those communes wishing to acquire the equipment.

²⁷ Article L.57-1 of the electoral regulations issuing from the law of 10 May 1969.

²⁸ In the Seventies, voting machines approved by the Ministry for the interior were used. Due to the fact that malfunctions occurred (repeated breakdowns, very high maintenance costs), they were gradually abandoned until they finally disappeared completely in 1986. This type of voting was only used in the Ile-de-France region and in Corsica.

2.2.1.2. Authorising electronic distance voting for local referendums

The constitutional amendment of 28 March 2003 expanded the role of local referendums. Although local referendums used to be simply consultative, article 72-1 of the Constitution henceforth laid down that all local governments may organise referendums of a decision-making nature. Organic law defines local referendum principles whilst polling procedures are referred for decree by the 'Conseil d'Etat' [Council of state].

The Internet rights forum wishes experiments with distance voting to be applied to local referendums.

2.2.1.3. Extending the possibility of electronic distance voting for the appointment of French nationals abroad sitting on the 'Conseil Supérieur des Français de l'Etranger'

The experiment conducted in the United States for the 'Conseil Supérieur des Français de l'Etranger', made possible by a law of March 2003 (cf. 1.3.9.), must, therefore, be generalised so as to facilitate voting for all French nationals living abroad.

The Forum recommends that electronic distance voting should be used by all French nationals abroad.

2.2.2. For 'prud'homale' elections

Although ruling relating to the simplification of the law adopted in July 2003²⁹ provides for electronic voting to be introduced for 'prud'homale' elections, the procedures specified by the latter are still to be determined.

'Prud'homale' elections do, however, appear to be polls of a sensitive nature in the eyes of the two sides of industry, since they enable the representative nature of the various trades union federations to be measured. Some sectors of management and labour have, therefore, clearly marked their opposition to any kind of electronic distance voting. The idea of electronic voting by means of voting kiosks seems, on the other hand, more easily acceptable.

Consequently, **the Forum believes that 'a minima' provision for voting at a voting kiosk in any polling station for 'prud'homale' elections may be envisaged.**

A change like this will be even more likely if elections take place inside 'mairies' and are able to use political election voting kiosks. In addition to this mutualisation of infrastructures there must be a debate on the electronic management of the electoral roll so that voting from any polling station can be offered.

It is undoubtedly possible to go further than this initial voting method and to provide for distance voting experiments for certain categories of voters.

There are two main reasons that support this change:

- the rate of participation in 'prud'homale' elections is low³⁰ ;

²⁹ Article 19 of law no. 2003-591 of 2 July 2003 authorising the Government to simplify the law provides for 'the introduction of electronic voting for elections to chambers of commerce, industry, trade and agriculture, to agricultural rent tribunals and for 'prud'homale' elections'.

³⁰ Out of the 17.5 million voters registered in 2002, only 5.6 million people voted, i.e. a participation rate of 32.6%.

- postal voting procedures have already been greatly relaxed and during the last elections all requirements for prior authorisation by the 'maire' of voters whose business prevented them from going to the polling station was removed.

The Forum recommends that electronic distance voting experiments be conducted during the next 'prud'homale' elections for the employers' board since the representative organisations are, on the whole, in favour of this change and the volume of the electoral body is relatively limited, and even **for the managerial section of the employees' board** for which the rate of computer access and computer literacy is, overall, high.

2.2.3. For ordinal and consular elections

Provision has been made for postal voting for most elections to professional orders, chambers of commerce, industry, trade and agriculture.

In addition, the aforementioned law of July 2003 provides for the introduction of electronic voting for chambers of commerce, industry, trade and agriculture.

Consequently, **the Forum believes that electronic distance voting should be the authorised voting method for these elections.**

With regard to elections to professional orders or to regulated professions, distance voting must be introduced if the organisations in question are in favour.

As has been said earlier, a distance election has already been conducted for the national bar council. One is also planned for the next consular elections and this type of voting is envisaged for elections to agricultural rent tribunals and for 'prud'homale' elections

The introduction of electronic distance voting requires amendments to texts applicable to these bodies so as to enable electronic distance voting in addition to postal voting. These texts are listed in the appendix.

2.2.4. For professional elections

The choice of electronic voting procedures should be left to dialogue between management and labour.

Professional elections have a particular symbolism for trades union organisations. They do, in fact, appear to be a special moment in corporate and governmental life, ensuring that the community gathers together and this is recognised by time being given off work.

What's more, workplace elections take place within a particular context since the employer, private or public, is the stakeholder and may be more easily suspected of seeking to falsify the poll or to find out how people are voting.

This is why many union contacts do not envisage the possibility of distance voting for employees' representative elections.

For all that, it would appear to be necessary, within this framework, to allow there to be dialogue between management and labour within companies and government offices so as to permit electronic voting to be introduced, where appropriate, by means of voting kiosks inside polling stations or by distance voting.

2.2.4.1. Professional elections within the private sector

Within the private sector, **the Forum recommends that the provisions of the labour law currently only permitting paper voting should be amended**³¹. Electronic voting should, therefore, be permitted by making the choice of voting procedures (distance voting, voting at a voting kiosk) subject to a prior agreement on the part of labour and management.

2.2.4.2. Professional elections within the public sector

In the public sector, **the Forum recommends that there should be consultation between the two sides so as to permit electronic distance voting for elections within joint administrative committees and joint technical committees**. The changes will require amendments to the applicable texts. A certain number of texts providing for postal voting for professional elections within the public sector appear in the appendix.

2.2.5. For elections within associations, general shareholders' meetings and public service user consultations

2.2.5.1. Learning lessons and encouraging the practice of electronic voting within associations and general shareholders' meetings

These elections are legally entitled to use electronic distance voting which often appears to be the solution most suited to their needs.

Associations' flexible legislative framework may enable them to operate by making use of information technologies. Electronic voting only requires amendments to the articles of association and possibly the rules of procedure. Jurisprudence has, therefore, agreed that an association may hold a general meeting via the internet³².

Corporate law has also permitted distance voting via the internet during companies' general meetings since the decree of 3 May 2002, issued on the basis of the law of 15 May 2001 relating to new economic regulations.

In all cases, **it would appear to be necessary to permit the main players to exchange their experiences**. Such experiments would be particularly interesting in major associative networks.

2.2.5.2. Permitting consultation and electronic distance voting for public service users

Some public service user elections made provision for postal voting (see in appendix).

The Internet rights forum recommends that consultation and electronic distance voting procedures be introduced for public service users provided that the main players involved are in favour.

This proposal could, for example, concern two sectors:

- elections of school parent representatives to school councils;
- elections of student representatives within universities.

³¹ Articles L. 423-13 and L. 433-9 of the Labour law lays down that '*The election shall be conducted by means of a secret ballot by envelope*'.

³² Paris 'Tribunal de commerce' [Commercial court], 10 October 2001.

3. PRACTICAL, TECHNICAL AND LEGAL PROCEDURES FOR THE ROLLOUT OF ELECTRONIC VOTING

The introduction of electronic voting for public polls means reviewing the organisation of the electoral process and, if necessary, adapting electoral laws.

Provision will be made for practical voting procedures within the scope of the specifications mentioned in 2.1.2.

3.1. The declaration to the 'Commission nationale de l'informatique et des libertés'

An electronic voting system that involves the use of automated processing of personal data, (in the sense of article 5 of the law of 6 January 1978³³). Henceforth, this must be the subject of a declaration to the 'Commission Nationale de l'Informatique et des Libertés' by the entity responsible for data processing, prior to the system being introduced.

3.2. Electronic management of the electoral roll

Electronic voting requires unequivocal authentication of the electoral capacity of persons taking part in the poll. Although they appear to be separate issues, debate on electronic voting also involves debate on electronic management of the electoral roll. This roll ensures that a person's electoral capacity cannot be expressed more than once during voting operations.

The electoral roll fulfils several roles:

- It lists all persons with the right to vote. This is the figure that may determine, if necessary, a legally defined quorum.
- It distributes these people according to a geographically determined territory, which is the polling station. Grouped into these communes, then into various electoral wards, it determines the right to choose between representatives within a defined territorial boundary.
- It constitutes the medium for the register of voters during voting operations. To this end, the electoral roll, approved on a certain date, is final. Any amendment supposes a legal decision taken in accordance with procedures defined restrictively by electoral law (Cf. art. L. 30 and subsequent articles)

The second point poses a problem when voting at a voting kiosk from any polling station is envisaged, such as for traditional political elections and 'prud'homale' elections. In fact, the polling station must be able to check that the voter has not already exercised his/her right to vote.

The Forum recommends, therefore, that electoral roll management be modernised.

Centralised electoral roll management already exists for 'prud'homale' elections. For political elections, INSEE [French national institute of statistics and economic surveys] is already responsible (art. L. 37 of electoral law³⁴) for managing a national voter file in order to prevent double registrations. Links with the communes are, however, entirely by means of traditional hard copy.

The Forum believes that modernised electoral roll management would involve rolls being managed electronically in the form of a voter file that would enable a consolidated register of voters to be produced for each election.

³³ In the sense of this article, for example, all operations performed in order to compile a computer voter file, the automatic processing of results for personal data relating to candidates or even the constitution of the register of voters, would be involved.

³⁴ Article L. 37 of electoral law: 'The 'Institut national de la statistique et des études économiques' is responsible for keeping a general voter file with a view to monitoring listing on electoral rolls'.

The Forum recommends that procedures for using this national file should be as follows:

- Verification of voting right

It should be possible to access the file from any polling station in the territory so as to check to see whether the voter has already voted at another polling station. This check may be performed by members of the polling station, as it is at the current time, or else direct by means of an authentication solution held by the voter.

The file may enable voters to check, prior to the election, whether they are listed on the electoral roll. This access must, however, be limited to the voter in question who should only be able to check his/her listing by means of a dedicated site. Full circulation of the electoral roll on the internet would, in fact, disregard the principles of personal data protection.

- Recording the voter's vote

The system must enable the voter, once verification has taken place, to make his/her choice from the ballot papers for his/her polling station's candidates at the voting kiosk.

This vote must then be transmitted to the electronic urn at his/her polling station.

It should be noted that this stage is technically more complex for elections involving a large number of candidates (local, regional, cantonal, legislative elections etc.) than for elections taking place within a single constituency (presidential, referendums).

- Updating of the register of voters and the electoral roll

The register of voters must be updated so as to indicate whether or not the voter has already exercised his/her voting right.

Updating of electoral rolls according to the electoral timetable rather than on a yearly basis, would prevent voters from being listed in two wards and would enable voters' increasing mobility to be taken into consideration.

3.3. Voting security

The attacks to which an electronic voting system could be subjected have been described in part 1.2.2.1. Nevertheless, the Forum believes that the security levels of an electronic voting system used for a major political election should differ from those implemented for an election within a professional order or an association.

Use of a VPN or Virtual Private Network³⁵ is likely to considerably reduce the risks of system intrusion. It is this type of network that will be used for political elections from voting kiosks.

It does, however, increase voting costs and cannot be used for distance voting with a large number of registered voters. It would, therefore, be difficult to envisage using this system for distance voting for major public polls. In this case, experiments will enable the difficulties relating to distance voting on a grand scale to be tested in a sufficiently clear-cut manner.

Cryptology solutions used by computer applications must be tough enough to prevent any intrusion that would put the voting process or the integrity of the data at risk.

³⁵ A VPN or Virtual Private Network consists of setting up a private sub network, within an unprotected infrastructure such as the internet, by means of secure connections.

Should the voting system jam, it must be possible to vote electronically at a neighbouring polling station. During the experimental phase, provision must be made for a paper voting system at central offices.

3.4. Voter authentication solutions

Voter authentication is not a problem when the vote is cast inside a polling station. In fact, it is then up to the members of the polling station to check the identity of the voter and to make sure that he/she has not already voted by checking the register of voters.

The question is, however, raised for electronic distance voting.

There are different voter authentication solutions on the market:

- identifiers and passwords
- electronic certificates
- smart cards

The authentication solution must be in proportion not only to the size and sensitivity of the poll, but also to its cost.

1) For elections where the stakes are limited, the Forum recommends that the voter should be able to identify him/herself quickly and easily by means of an identifier and a password.

In this case, the voter may be given a unique personal identification number (PIN code) which must only be valid for one single poll. In fact, so that the voter's selection is never associated with his/her ballot paper, the PIN codes must be generated in a random fashion and must have a life limited to just one ballot. It is possible to imagine an election within an association, or even a professional order, being operated in this way. Depending on the sensitivity of the poll, it is possible to envisage that the password could be sent by recorded delivery mail so as to limit the risk of fraud. This precaution would, however, increase the cost of the election.

2) For more sensitive and more regular elections, the Forum recommends that provision be made for a double identifier.

In this case, the voter must first be given a general identifier and then a second identifier will be sent to him/her at election time.

3) Authentication solutions offering a higher level of security do exist, such as electronic certificates³⁶ or smart cards.

The CNIL has estimated that voter authentication based on an electronic certificate would be the most satisfactory state-of-the-art solution³⁷. We can also think about authentication by means of a secure personal card of the 'smart card' type. Incidentally, the latter may be combined with biometric systems (fingerprints, for example, i.e. experiments mentioned in 1.3.1.).

The Internet rights forum recommends that the voter authentication dimension should be taken into consideration in the 'daily life card' and 'electronic identity card' projects.

³⁶ Electronic certificates, which are available with several different security levels, are distributed in the form of a piece of software that can be installed on a computer hard drive or carried on a smart card. The certificates rely on the principle of asymmetric cryptography which combines a private key issued to the person in question and remaining under their control with a public key which enables their identity to be established.

³⁷ Decision no. 03-036 of 1 July 2003 bringing about the adoption of a recommendation relating to electronic voting system security.

For example, with regard to the daily life card, the authentication and access control card aspect proposed therein may permit voting for local elections³⁸. The public body responsible for validating the implementation of a system such as this could be the 'Direction centrale de la sécurité des systèmes d'information' [Central information systems security division]³⁹.

3.5. Voting confidentiality and sincerity requirements

The system must also be designed so as to prevent the vote cast by the different voters from being retraced or amended.

The CNIL has, in addition, recently adopted technical recommendations on the subject of electronic voting system security⁴⁰ where it specifies that '*voting secrecy must be guaranteed by the implementation of procedures that make it impossible to establish a link between the name of the voter and the expression of his/her vote*'.

The Forum has established that, with state-of-the-art technologies, the identity of the voter and his/her choice of vote may appear simultaneously for a very short period of time on the voting machine. The Forum has also found that, with enough computer power, it is possible to decode ballot papers that could be damaged in the medium term.

Within the scope of strict adherence to the principles listed in the specifications (cf. 2.1.2.), this risk can be limited by making provision, in particular, for the roles of the different technical players providing the electronic voting system to be separated, and by reaffirming the system administrator's obligation of confidentiality.

Within the scope of public polls, **the Internet rights forum recommends that voting operations should be entrusted to two different technical players, properly identified as such, and whose computer systems are separate, dedicated and isolated**, known hereinafter as voting system administrators:

- The manager of the electoral roll that gives the authorisation to vote;
- The manager of the electronic urn that collects the votes.

The Forum recommends that the voting system architecture should be secure enough to prevent voting system administrators from being compromised (reconstruction of the voter's choice of vote, usurpation of identity, urn jamming etc.). Of course, these administrators must be able, if necessary, to carry out technical maintenance (repairs in the event of breakdown etc., but the **Forum wishes to reiterate the fact that they should never be able to implement procedures enabling them to modify either the number of votes in the electronic urn, or their contents.**

The Forum also wishes to specify that guaranteeing the integrity of the information transmitted also supposes that a system or machine breakdown could not result in votes already cast being erased or amended.

³⁸ On 9 July 2003, the ministry responsible for State reform, the 'Caisse des Dépôts' [public savings office] and a certain number of local authorities launched pilot 'Daily Life Card' applications. This card gives access to the services supplied by different administrations or public services. Three types of services can be offered i.e. a card intended for schoolchildren and students enabling them to pay (by virtue of a family account associated with the card) for services (school dinners, photocopies etc.) and to access facilities (media resource centres, swimming pools etc.), a transport card (intended for all) and an authentication and access control card, for the entire population, that can be used for physical services (institutional catering, sporting and cultural facilities) and dematerialised administrative acts (signing forms on the internet, access to tax accounts, company accounts etc.).

³⁹ 'La Direction centrale de la sécurité des systèmes d'information' (DCSSI) [Central information systems security division] is answerable to the Secretary general for national defence. Its mission is, in particular, to contribute to defining government policy regarding 'sécurité des systèmes d'information' (SSI) [information systems security], to act as a national SSI regulatory authority (by issuing approvals or certificates for Government information systems and for cryptology procedures used by the government and public services) and even to develop scientific and technical expertise within the domain of SSI, to the benefit of the government and the public services.

⁴⁰ Aforementioned decisions.

In order to prevent such risks, an obligation of confidentiality is guaranteed by article L.116 of the electoral law which provides, in particular with regard to voting machines, for penalties for individuals interfering with voting secrecy⁴¹. Likewise, article 29 of the 'Loi Informatique et Libertés' [data protection law] provides a framework for this by guaranteeing the security of the information transmitted⁴².

Nevertheless, **since the scope of article L. 116 is quite wide, the Forum wishes to specify that it should be applied not only to those responsible for the poll but also to engineers in charge of the smooth operation of the technical device.**

For all that, and even if the risks of the voting system being compromised are still possible, such risks must not prevent electronic voting from being developed. It is, in fact, necessary to find a balance between the cost of the election and the voting security desired. This balance must be dependent on the poll and must not increase the complexity of the latter nor raise its costs.

This is why **the Forum believes that the aforementioned voting system recommendations should apply, as a priority, for the largest polls, i.e. public and professional polls.**

3.6. Electronic voting rollout

3.6.1. Electronic voting operations

Diagram of electronic voting sequence

The **communications networks** enable a link to be established between the four 'players':

- The virtual polling station (voting kiosk, personal computer etc.)
- The manager of the electoral roll
- The manager of the electronic urn where the votes are stored during the poll
- Those responsible for the poll (chairman, assessors) who check to see that it is running smoothly and monitor its closure and processing and analysis of votes.

⁴¹ 'Those who, by means of any fraudulent representations whatsoever (...), have interfered with, or attempted to interfere with, the sincerity of the poll, have breached or attempted to breach voting secrecy, prevented or attempted to prevent polling operations, or who, by the same fraudulent representations, have changed or attempted to change the results, shall be punished by the penalties contained in said article. The same penalties shall be applied to any individual who may have damaged or attempted to damage the operation of a voting machine with a view to preventing polling operations from continuing or falsifying results'.

⁴² 'Because of this, any person sorting or processing personal data shall undertake, in respect of the persons in question, to take all necessary precautions to keep the information safe and, in particular, to prevent the information from being deformed, damaged or communicated to unauthorised third parties'.

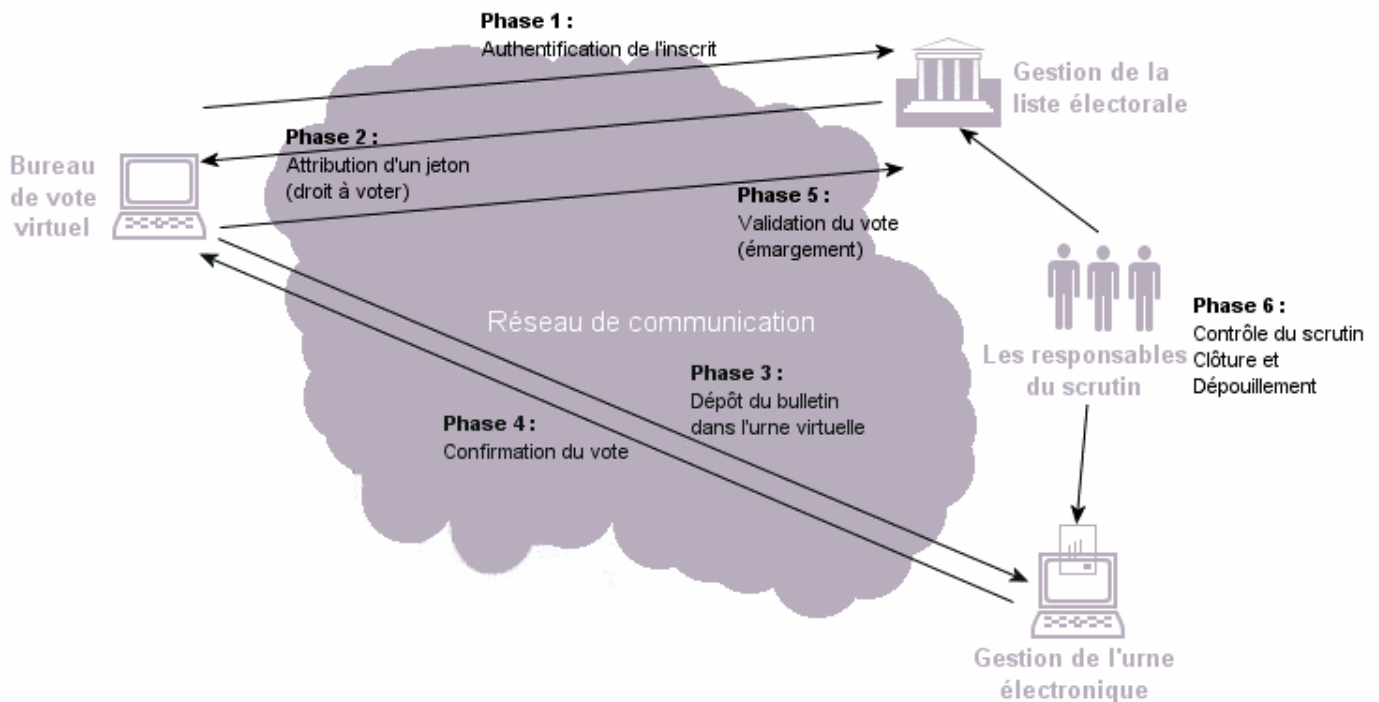


Diagram text:

Phase 1: Authentication of the registered voter

Phase 2: Assignment of a token (right to vote)

Phase 3: Placing of the vote in a virtual urn

Phase 4: Confirmation of the vote

Phase 5: Validation of the vote (check to ensure the voter has not already voted)

Phase 6: Poll audit. Closure and processing and analysis.

NB: All the phases use the communication network to form a link between the players. The proposed diagram, which applies, above all, to elections of a political nature, can be adapted for any type of poll or consultation.

Description of phases:

Phase 0: System initialisation. Before the poll opens, those in charge of said poll must be able to check the integrity of the electoral roll, that the virtual urn is empty and that the vote counters are set to zero.

Phase 1 : The voter must prove his/her identity to the manager of the electoral roll. As seen above (cf. 2.3.4.), the procedure used may range from the use of an identifier combined with a PIN code to use of a smart card.

Phase 2: If the voter is authenticated (entered on electoral roll) and has not yet voted, he is credited with a token (random number), giving him/her the right to vote. The voter then

makes, from his/her virtual polling station, the selection, or selections, appertaining to the poll.

Phase 3: The virtual ballot paper is encrypted and, accompanied by a token supplied by the electoral roll manager, is transmitted to the virtual urn. The encrypted ballot paper is retained in this state, in the virtual urn, until the counting phase.

Phase 4: Upon receipt of the ballot paper, the electronic urn confirms that the vote has been received.

Phase 5: Upon receipt of voting confirmation, the virtual polling station transmits a request to the manager of the register of voters. This register of voters is associated with the voting identity and may, possibly, be stored on a smart card. The manager of the register may then validate the voter's vote and complete the voting sheet (preventing the voter from voting more than once). It must be possible to print out the register of voters who have voted electronically and possibly use it to record the votes of other voters voting by post or at the urn. In addition the CNIL wants⁴³ the record to 'include a time stamp'.

Phase 6: When the poll closes, the managers open the virtual urn and analyse the votes. The ballot papers are decoded, so as to extract the content of the vote and are then counted. The Forum recommends that the activation of the decoding key should be conditioned by the simultaneous and complementary action of two managers i.e. the chairman of the vote and one of his assessors.

During the polling process, the polling managers must be able:

- to register the number of ballot papers placed in the urn,
- to register the number of voters expressing a vote (establishing the participation rate).

3.6.2. Determining special procedures for electronic distance voting

The Internet rights forum recommends that electronic distance voting should take place over several days.

The voter may, therefore, benefit from a longer period in which to exercise his/her voting right. This extension also means less risk of the information systems becoming congested. This extension can also apply to postal voting. It has been introduced for electronic voting for the 'Conseil Supérieur des Français de l'Étranger', in the United States⁴⁴.

This voting period must, however, conform to certain constraints:

- The voting deadline must be adapted to the nature of the election and the sociology of the voters. It must not be so short that there is a risk of depriving some voters of the opportunity to vote, in particular if the identifier only reaches the voter a few days prior to the vote.
- The date on which the poll is to open must be given to the voter when his/her identifier is sent out. If the voter attempts to send his/her vote prior to this date, the system must tell him/her that the poll does not open until a later date.
- The final date after which the vote cannot be recorded must be made clear to the voter when his/her identifier is sent out.

The Internet rights forum believes that it would be preferable for the electronic voting deadline to be prior to the deadline for voting at a polling station. This precaution will facilitate checking to ensure that voters have not already voted.

⁴³ *Ibid.*

⁴⁴ Electronic voting for the CSFE was spread out over 12 days.

The Forum recommends that electronic voting should be final. Although taking place over several days, it should not be possible to amend the vote once it has been cast. Voters will not, therefore, be able to substitute electronic votes with votes cast at the urn on the day of the election or with postal votes.

Of course, the opportunity to take back one's vote exists for some postal ballots where the voter, arriving at the polling station on the day of the poll, can withdraw the ballot paper that he/she has previously posted. This offers the benefit of ensuring that the voter's voting right is not usurped by another person but would make it impossible for the voter's identity and the nature of his/her vote to be separated during electronic voting.

This difficulty can be avoided if the system uses an electronic signature operating on the principle of asymmetric encryption. The electronic signature placed on the electoral register would mean that the act of voting could not be repudiated and so would be a form of proof of voting. This solution does, however, involve higher costs.

3.7. Encouraging voters to take the electronic voting system on board and have confidence in its operation.

3.7.1. The ergonomics of the electronic voting system must be studied so as to make voting as simple as possible for users

The candidacies must be as legible as possible for the voter. Furthermore, in the event of electronic distance voting, the electronic voting system must be adapted to the different systems used by users, such as, for example, internet navigators.

3.7.2. Surrounding electronic voting with a certain solemnity and providing for voting confirmation

Prior to the vote becoming final, the system must ask the voter for a double confirmation both to surround the vote with a certain number of voting gestures demonstrating the solemnity of the voter's electronic voting act and so that he/she can ensure that a keying error has not occurred. The voter must, therefore, have the option, provided that he/she has not confirmed the vote, of changing the way in which he/she intends to vote.

3.7.3. Supporting election players whilst electronic voting is implemented

It is necessary to support not only voters but also all the election players and, in particular, the election candidates and administrators, whilst electronic voting is being introduced, whatever the procedures used i.e. voting at a voting machine or distance voting.

The Internet rights forum therefore wishes the introduction of electronic voting to be accompanied by information and training initiatives. These initiatives, aimed at encouraging people to take on board information technologies and at citizenship training, may be conducted within digital public spaces or within the scope of the 'Citizenship education on the internet' project set up by the Department of Education on the initiative of the Internet rights forum.

3.8. Encouraging checks on voting operations

3.8.1. Enabling the integrity of the voting system to be monitored

The Forum believes that a voting system's integrity is only guaranteed to the extent that it checks for the absence of compromises both upstream and downstream from the polling operation. This monitoring must be performed, for elections of a political nature, by experts approved by the Ministry for the interior. A system is,

therefore, deemed to be just if the source code can be accessed, if the system cannot be modified⁴⁵ and if an 'a posteriori' audit is implemented.

3.8.2. Providing for storage of voting data

The Forum wishes voting data to be stored until judicial appeal deadlines have expired so that they can be submitted before the election judge and the criminal judge in the event of dispute or fraud. On the other hand, the data should not be stored longer than is required for this monitoring.

3.8.3. Providing for the judge to have access to the data

Data storage procedures must make it possible for said data to be used by election judges and criminal judges. The Forum recommends that data should be generated by the service provider and stored in a safe place where there is no chance of any amendments being made. In this respect, **the Forum wishes this place to be, for elections of a political nature, the place where election reports are traditionally kept.**

It must be possible for the judges simply to read this data to check for consistency and to form an opinion regarding the methods used by the applicants, even if these are technical methods. To do so, they must be able, if necessary, seek the advice of technical experts of their choice.

The Forum recommends that servers should be located on national territory so as to enable operations to be effectively monitored by polling station members and deputies as well as to enable intervention, if necessary, by the competent national authorities.

3.9. Evaluating the electronic vote

Public polls conducted using electronic voting must be the subject of special follow-ups and evaluations. This type of follow-up and evaluation already exists in lots of countries. This is, for example, the case in the United Kingdom by means of The Electoral Commission, an independent body created by the British parliament in November 2000.

The Internet rights forum recommends, for this reason, the creation of an electronic voting 'observatory'. This Observatory should be attached to the 'Agence pour le développement de l'administration électronique' [Agency for the development of electronic administration], taking into consideration the interdepartmental nature of its duties⁴⁶.

This Observatory would have the following duties:

- to centralise information and lessons learnt from electronic voting experiments and to conduct international research;
- to lend its expertise to ministries responsible for organising polls when voting systems for public polls are being approved. It could also be consulted by relevant ministries regarding voting systems proposed to them by private service providers;
- to evaluate electronic voting systems used during major public polls at the request of the ministries involved. This evaluation must, in particular, include a sociological aspect by

⁴⁵ To this end, the CNIL uses the term 'sealing' with regard to electronic voting systems, i.e. a 'procedure enabling any modification of this system to be detected' (decision no. 03-036 of 1 July 2003).

⁴⁶ According to the terms of decree no. 2003-141 of 21 February 2003 bringing about the creation of interdepartmental services for State reform, the task of the 'Agence pour le développement de l'administration électronique' is, in particular, to encourage the 'development of public policy evaluation' (art.2, paragraph 4).

studying voters' perceptions of electronic voting and by encouraging research work conducted into electronic voting.

- To provide information on its activities by means of the publication of an annual report.

This 'Observatory' should bring together the diverse skills available within the government. It should also enable, for the sake of transparency and the juxtaposition of skills, community-based and private sector players to be brought together. A multidisciplinary observatory alone will be able to gain voters' confidence.

The Observatory could, also be comprised of:

- elected representatives;
- Government representatives i.e. from the CNIL, and from government departments specialising in organising elections and information systems security i.e. DCSSI, and the ministries involved (ministry for the interior, department of employment for professional elections, department of justice for regulated professions organising ordinal elections etc.);
- representatives of companies organising electronic voting;
- persons qualified within the domain of electoral law (judges, universities), information technology and sociology (universities, researchers).

CONCLUSION

As with other activities, the vote is currently being won by new technologies and dematerialisation.

This aim of this report was to clarify the debates and the stakes involved in electronic voting and to show that this system of voting could be introduced into the French electoral process following a gradual and reasoned approach.

The introduction of information and communication technologies (ICT) into voting operations does, in fact, considerably simplify the polling procedure, in particular, by making it faster and more functional. It echoes the increasing use of the internet in our society.

Electronic voting alone will not, however, change citizens' political attitudes. It, alone, will not be able to combat the growing disinterest of the latter with regard to the polls.

On the other hand, it would appear that ICT offers individuals new forms of expression and participation (discussion forums, debates, chat rooms, on-line public surveys etc.) which may motivate them to have more of a presence in local debates and to be more active in public or private decision-making. These new practices are part of the principle of player accountability that is at the heart of the Internet rights forum's approach.

The 'democratic' contribution of information and communication technologies lies as much in the latter as in electronic voting.

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