

# Access to e-Voting for persons with a reading handicap

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## ABSTRACT

Over the last years more and more elections have been organised in which the voting process is handled electronically.

However, several of these systems are not accessible for persons who have a low vision or are fully blind, i.e. they do not fit into a Design for All philosophy.

In this contribution, I will discuss the current situation in Europe as collected from a questionnaire distributed in the beginning of 2007.

The focus will be on European initiatives but also on the situation in Belgium and in France.

## Keywords

Elections, electronic voting, accessibility, guidelines

## 1. INTRODUCTION

As voting is a democratic right (sometimes a plight) for all citizens, having access to the voting activities must be guaranteed to everyone under all circumstances.

Previously the word “accessibility” was just about physical access to the ballot buildings or booths. Nowadays accessibility is a much broader issue because of electronic voting equipment and internet voting (e-accessibility).

In this contribution two major parts can be distinguished: a) a short overview of the situation several countries and b) an aggregated list of essential requirements for any future eVoting system that would be developed.

### 1.1 Overview of Accessibility Activities in several countries

#### 1.1.1 Situation in the United States of America

##### 1.1.1.1 Help America Vote Act (HAVA)

HAVA 301(A) (3)(a) describes an accessible system as follows:

“Accessibility for individuals with disabilities.--The voting system shall be accessible for individuals with disabilities, including non-visual accessibility for the blind and visually impaired, in a manner that provides the same opportunity for access and participation (including privacy and independence) as for other voters;”

Already in 1984 the US accepted the “Voting Accessibility for the Elderly and Handicapped Act (1984); 42 U.S.C. 1973ee-6”. [1]

#### 1.1.1.2 National Institute of Standards and Technology (NIST)

This governmental organization has been made responsible for studying the technological implementations of modern voting systems [2]. A special “Technical Guidelines Development Committee” was created that is currently the federal advisory board drafting all voting system guidelines.

This committee has several subgroups, including the Human Factors and Privacy subcommittee (HFP). This group handles sections on usability and accessibility [3].

There are a number of research reports and informal white papers on detailed issues available. The current version of the guidelines (VVSG 2005) will be superseded by the 2007 version in the near future. One of the recent additions is on guidelines for Voter Verified Paper Audit Trails, which currently present accessibility problems for visually impaired voters. It is suggested that accessible voting equipment might have to provide an automated reader that converts the paper record contents back into audio output [4].

#### 1.1.1.3 American Association for People with Disabilities (AAPD)

This organization maintains an annotated archive on the accessibility of electronic voting under the name "Making Voting Accessible for Everyone" [5]. Lots of links about voting machines' usability and accessibility are available. One of the links is on a rather unique concept: voting by telephone (Inspire™ Vote-by-Phone) but further study reveals that the voter still has to go to a polling booth where this type of telephone access is available. A VVPAT is also available with this system [6].

#### 1.1.2 Situation in Europe

The situation is quite diverse. Our major sources on voting accessibility are the European Blind Union's study from 2004, a decision from the Council of Europe (2004), a few guidelines by major national organizations for the Blind and results of recent internet voting experiments.

##### 1.1.2.1 Study of the European Blind Union

The EBU report is based on the answers from their members to a rather open question on the national voting procedures. As a consequence, answers are rather diverse and ad hoc. Furthermore almost no reference to electronic voting was made. For this report only the most important conclusions are grouped.

In all European countries handicapped voters can be assisted by a third person [7]. In some countries this person can be chosen by the voter, in others it is the president of the voting bureau who

designates an independent assistant. Sometimes the help of an assistant in the voting booth must be required beforehand; in other countries no formalities are needed.

Some special situations are mentioned.

In **Austria** templates for the traditional ballot forms with holes punched out for the parties are available so that a blind person can vote independently (provided he/she knows the layout of the ballot form by heart).

In **Denmark** and **Finland** voting by letter is permitted for handicapped persons. In that case a guide/assistant of one's own choice can help in filling out the necessary information on the ballot sheet.

In **France** ballot forms can be received by post a few days before the elections. Handicapped users can study the slips (with some help) and choose which ones they want to put in the ballot box on the Election Day. Postal votes are not allowed.

The French Law of February 2005 requires every voting system, including voting machines, to be made accessible for persons with an impairment [8]. The 2007 presidential elections have shown that this is still rather theoretical.

In **Germany** voting through mail ("home voting") has been practiced by blind voters in Germany for decades. Since 2002 blind people in Germany are allowed to use voting templates in the polling booths. Templates are different from state to state and are produced on demand only [9].

In **Spain** most of the important parties distribute their programs in Braille.

In the **UK**, visually impaired people want to be able to go to the polling station and to vote fully independently. Although promoted intensively by the Royal National Institute of the Blind, no law imposing accessible ballot forms is in place.

### 1.1.2.2 Other National Initiatives

The **Swiss** canton of Geneva showed, back in 2003, that voting machines could have voice output and speech recognition input without compromising voting security. This was demonstrated at the International Telecommunications Union (ITU) sponsored WSIS conference [10].

In **Austria** some discussions are going about the question what exactly is meant by the law when imposing "equivalent alternatives" to technical solutions. For hearing impaired and deaf people sign language could be offered. An alternative to easy-to-read can be provided. E.g., Additional "reader support" might be needed as the information is to be translated into an individual context of understanding. The question still remains open if these solutions are acceptable in the framework of existing anti discrimination legislation [11].

Both in **Spain** and in the **UK** national organizations for the disabled (ONCE [12], RNIB [12], DRC [13]) have issued specialized documents on voting accessibility. Some of their conclusions have been incorporated in our second part (cf. Aggregated Guidelines, below).

### 1.1.2.3 Council of Europe 2004

The Committee of Ministers of the Council of Europe issued a guidelines document on electronic voting in 2004 [14]. It contains in its appendix III a small list of accessibility related issues:

#### A. Accessibility

61. Measures shall be taken to ensure that the relevant software and services can be used by all voters and, if necessary, provide access to alternative ways of voting.

62. Users shall be involved in the design of eVoting systems, particularly to identify constraints and test ease of use at each main stage of the development process.

63. Users shall be supplied, whenever required and possible, with additional facilities, such as special interfaces or other equivalent resources, such as personal assistance. User facilities shall comply as much as possible with the guidelines set out in the Web Accessibility Initiative (WAI).

64. Consideration shall be given, when developing new products, to their compatibility with existing ones, including those using technologies designed to help people with disabilities.

65. The presentation of the voting options shall be optimized for the voter.

### 1.1.2.4 European Parliament – Disability Intergroup Meeting on Access to Voting

This parliamentary group met in October 2003 together with representatives of the European Disability forum. From the report [15], we distill following recommendations to electoral authorities:

- only accessible public buildings are to be used as polling stations;
- a statutory review has to be made of the accessibility to polling stations;
- pictorial guides have to be available for persons with learning disabilities;
- individual access needs of the voters are to be considered in the design of the system.

## 2. Preliminary information on Internet Voting Accessibility in Europe

### 2.1 Small overview

Internet voting is becoming more and more popular and its principles and security measures have been studied intensively since many years. Some countries have accepted it, others are strongly opposed, almost exclusively because of security concerns.

Because of this, relatively little activities around internet voting accessibility for reading impaired persons have been going on up to now.

**Estonia** was the first European country to permit internet voting in October 2005 (Elections for local governments). Available technical documents [16] focus only on security issues

but do not give information on accessibility [17] of the internet applications for reading impaired persons nor do they refer to the Council of Europe 2004 guidelines (cf. above). The fact that Estonia was an early adopter was due to the fact that internet access is a constitutional right in Estonia and that already at that time 60% of all citizens had electronic identity cards that can be used for asymmetric cryptographic operations.

Anyhow Estonians had the right to choose for traditional voting, even after having cast an internet vote.

## 2.2 Belgium

### 2.2.1 BCBS-CBPAM

The Belgian Confederation of Organizations for Blind and Low Vision People groups most of the organizations in the field. It produced in 2003 a list with recommendations for access to voting machines [18]. BCBS-CBPAM also collected information about physical access to voting offices, some of it related to the October 2006 elections.

### 2.2.2 GAMAH

The Groupe d'Action pour une Meilleure Accessibilité aux personnes Handicapées organized a web based questionnaire on people's opinions for access to the elections in October 2006 [19]. The results are detailed:

- Briefly on their website: <http://www.gamah.be>;
- In their regular publication: *Le Vilain Petit Canard*, décembre 2006 ;
- In a special report: "Résultats de l'Enquête – Electeurs à mobilité réduite ou présentant des difficultés de compréhension: citoyens à part entière ou entièrement à part" [20].

The major results of the 2006 questionnaire are:

- 96% of the interviewed persons had voted independently;
- About 1,6 % of those came to vote because of the new facilities proposed in the Courard decree;
- About 18% have appreciated the existence of large print instructions (1,50 times standard size) and large size paper voting bulletins;
- A majority of visually impaired voters had problems to prepare themselves for the elections: inaccessible party websites, promotion material in too small character sizes etc.;
- Motor handicapped voters needed help in 29% of the cases when voting on paper and 34% in case of electronic voting.

Out of these questionnaire results, GAMAH distilled a wish list for future elections. This will be detailed in the guidelines part of this contribution

## 3. Aggregated Guidelines

Based on the author's personal expertise and on the information collected from the different countries, we conclude that minimally the following accessibility requirements should be put forward for any new voting systems.

## 3.1 General Remarks

### 3.1.1 Internet Based Information Systems

All types of impaired users should be able to collect as much information as possible about the voting process. A major information channel (sometimes the only one that is accessible for them) is the internet, and more specifically Web pages.

Since the middle of the nineties several attempts have been made to create guidelines for the construction of accessible web pages. Many organizations from all over the world have bundled their efforts within the Web accessibility Initiative (WAI) within the World Wide Web consortium (W3C). This led to the creation in 1999 of the so-called **WCAG v. 1.0** guidelines [21].

The WAI group proposed three levels of accessibility and consequently three logos have been developed to mark accessible web pages. As there is no strict checking mechanism in place, these logos have sometimes been abused.

In the US but also in almost all European countries national organizations have been set up to ensure that website accessibility is checked by specialists (quite often with help from checking software). In Belgium a national organization was set up with major support of the Blindenzorg Licht en Liefde and Oeuvre National des Aveugles organizations (Anysurfer) [22]. In France the organization BrailleNet is in charge of promoting and testing internet accessibility. Recently they also started the European Certification project "Euracert" ([www.euracert.org](http://www.euracert.org))

### 3.1.2 Internet Voting

A very specific situation appears when the internet is used for the voting itself. It is clear that the above mentioned WAI/Anysurfer/Brailent guidelines have to be obeyed by the equipment, but in this case it also must be guaranteed that all related aspects are catered for:

- accessibility of the identity checking procedures; variants must be admitted as e.g., some biometric systems will not work when people do not have fingers, hands, functional eyes, an understandable voice etc.;
- accessibility to the information on electronic identity cards;
- accessibility to any peripherals that are needed in the voting process.

### 3.1.3 Information Material

Several regions in Belgium have issued flyers for the past elections. The Brussels and Walloon regions, e.g., have produced (under guidance of the Passe-Muraille organization [23]) a specialized brochure for handicapped voters of the 2006 elections. This is especially valuable for those persons but in that case governments definitely have to make sure that accessible versions do exist [24].

## 3.2 Specific Guidelines

From the information collected above we distilled the following specific guidelines for the groups and administrations that are responsible for organizing elections:

- 1 All authorities (and preferably also the political parties) involved in information distribution via the internet

should respect the WAI guidelines for accessible web page design. WAI/Anysurfer/Brailenet testing should be made obligatory for official websites related to the voting process. Attention must be paid to persons that need easy-to-read information. [25]

2 Official websites must also have an adapted simulation of the electronic voting procedure so that a reading impaired person can try out the procedures before going to the voting place itself. [26]

3 Users shall be involved in the design of eVoting systems, particularly to identify constraints and to test ease of use at each main stage of the development process. [27]

4 Consideration shall be given, when developing new products, to their compatibility with existing ones, including those using technologies designed to help people with disabilities. [28]

5 The electronic voting machines must have adapted outputs such as large characters and a synthetic voice (e.g. with headset) [29]. In order to gain experience, the development of experimental accessible voting machines and their testing should be stimulated.

6 When producing printed information material (flyers, brochures) related to the elections, authorities should make sure that different accessible formats are available for reading impaired persons and other disadvantaged groups in the community. [30]

7 Key access standards must not have the appearance of "optional extras", rather they must be core obligations and this should be reflected in any government order for voting equipment. [31]

8 Physical access: Impaired voters should have the choice to go to accessible voting places. On a longer time scale administrations should strive to make all voting places accessible. They also must be guaranteed the right to be accompanied in the voting booth by a person of their choice. Sufficient accessible parking places must be planned close to the voting places. Chairs must be available for persons that have to wait before casting their vote. The height of voting screens should be adapted for persons in a wheelchair or, better, should be adaptable [32]

9 Ensure provision of disability awareness training for polling station staff. [33]

10 Ensure to receive feedback from disabled people after the elections and to learn lessons for the next one!

#### 4. Conclusions

Although access to the voting process for persons with impairment has been organized and studied quite a lot over the past, three major issues are nowadays still very much open:

a. In the past, the fact that a handicapped voter could be accompanied by a third (non-handicapped) person was seen as sufficient. Nowadays more and more handicapped people want to cast their vote completely independently. On the other hand, computerized voting might prove to be too complex for large groups of (reading) impaired users and traditional voting systems will have to be maintained in parallel.

b. Very little experience with voting machines and even less with internet voting is available. One will have to rely here on existing and future computer usability standards developed by groups such as the World Wide Web consortium, and the standardization bodies ISO (global) and ETSI (European).

c. Voting machines are to be bought through public tender. The European Commission has given recently a Mandate (#376) to the European standardization bodies (ETSI, CEN & CENELEC) in order to come up with an accessibility requirements list that should be added to all public tender documents. By doing so, accessibility in the future will also become a tendering criterion in its own right.

#### 5. REFERENCES

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- [2] <http://vote.nist.gov>. This site also archives white papers and other materials from the working groups.
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Anysurfer guidelines can be found in Dutch at: <http://www.anysurfer.be/nl/richtlijnen>  
and in French at: <http://www.anysurfer.be/fr/directives/ce-que-vous-devez-savoir>
- [23] Two French and one Dutch version are available from: <http://www.passe-muraille.be/>
- [24] Accessible versions do include: large print, braille, audio, Daisy (Talking book), tactile materials, internet sites obeying to the Anysurfer guidelines, sign language videos and easy-to-read versions for persons with a cognitive impairment.
- [25] Based on Council of Europe guideline nr 63 and on the GAMAH study
- [26] Based on the Gamah study
- [27] Based on Council of Europe guideline nr 62 and on the recommendations of the European Parliament's Disability Intergroup (Sarah Gull)
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- [29] Based on conclusions of the GAMAH study; instead of headsets, GSM based communication (e. g. bluetooth) may be conceived in the future but will probably be much to complicated for modal users.
- [30] Inspired by the Belgian Anti-Discrimination act of 2003 and on DRC guideline 4.2
- [31] Based on DRC guideline 3.6
- [32] Based on conclusions of the GAMAH study; incorrect screen height might lead to parallax errors (people touching the wrong buttons)
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