

# Stumbling Blocks of Electronic Voting Revealed by U.S. and European Experiences

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## INTRODUCTION

The question of electoral participation has today become a major issue for the future of democratic systems. In the USA and Europe, voter turnout continues to fall. Faced with this strong erosion of political participation, the watchword is mobilization.

In this connection, several proposals, chiefly technical in nature, have been put forward to curb this rising voter absenteeism. For example, several projects have been developed with a view to putting in place new voting procedures, including among others, telephone voting, postal voting, computer voting, Internet voting, using pre-perforated cards, mobile phones or digital terminals installed in public places (shopping centres, public buildings, etc.).

## BACKGROUND

In the face of this multiplication of new experiences, it is in the interest of democracy to examine, in a rigorous and objective way, such developments, based on empirical material provided by the political entities that have tested one or more new voting methods. However, the relevant information is often dispersed among various governmental and electoral authorities and available solely in the political entity that initiated the experiment. It is therefore appropriate to summarize the main experiments carried out and the main lessons to be learned from them.

It is not possible, however, to review all the experiments or to cover every new possible voting technique, as this would require far more than a short article. Consequently, we will focus solely on USA and Europe, and on two forms of e-voting that are computer voting and Internet voting. Actually, there is a debate on the validity of this distinction. For some, the appropriate distinction

is between attended e-voting and unattended e-voting. The previous supposes that the voter go to a polling station to cast a vote, while, for the later, the voter can cast his vote from any place where there is an electronic device connected to a network transferring the vote to the electoral authorities.

In this article, we do not follow this line of argument. The core distinction is between computer voting and Internet voting. In the previous, voters go to a polling station to cast a vote on a computer that is not connected to any network. In the latter one, the vote is cast through any electronic device connected to a network transferring the vote to the electoral authorities. Unlike unattended e-voting, the connected electronic device used can be in a polling station. The choice in this article is related to the fact that when there is a connection to a network (in the polling station or not), it has crucial consequences for the security of the system.

Within this framework, we will address only the most interesting experiments in terms of the issues involved in such changes. To that end, we have used public and semi-public documents<sup>1</sup>, as well as scientific studies, for the purpose of our evaluation. On that basis, we will set out the details of the main experiments in this area, before highlighting the lessons learnt and problems revealed by those large-scale tests.

## COMPUTER VOTING

The most significant breakthrough in the use of NICT in the electoral process concerns computer voting. In numerous countries, regions and cities, its use is becoming increasingly widespread.

In The Netherlands, computer voting has become common practice for voters. At the last Dutch general election in May 2002, 95% of the Dutch municipalities

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provided electronic voting machines (Nederlandse Ministerie van Binnelandse Zaken, 2003). Citizens in the Netherlands use touch panels to vote. In Belgium, since 1994, computer voting is used in several municipalities. At the last federal elections in 2003, computer voting had replaced paper-based voting in 34.1% of the country's cities (44% of the population)<sup>2</sup>. Florida is also noteworthy in this regard. A touch-sensitive screen was one of the voting solutions used in that state in the 2004 presidential elections to avoid the voting imbroglio of 2000. Finally, in various countries, including UK, computer voting is one of the new voting methods currently being tested (Office of the Deputy Prime Minister (ODPM), 2002)<sup>3</sup>.

The success of computer voting cannot be explained in terms of convenience, since voters still have to go to a polling station to cast their vote. Therefore they do not save any time, or very little time. Moreover, observers agree that computer voting does not improve strongly the level of voter turnout at elections (MORI, 2003). Moreover, it is even possible that the queues caused occasionally by technical problems have discouraged certain electors.

The main advantages of this new voting technique correspond to objective such as ensuring the accuracy of counting and avoiding errors and spoilt ballots. With regard to the risk of fraud or malpractice when counting votes, computer voting is considered less vulnerable to "rigging" than paper-based voting or voting using pre-perforated cards. This security criterion is particularly important in countries where trust in the authorities is far from absolute (Saltman, 1998). In addition, and that is undoubtedly the main argument, computer voting avoids the problem of votes being invalidated because of voter errors such as double voting and spoilt ballots (Independent Commission on Alternative Voting Methods (ICAVM), 2002).

Nevertheless, those positive arguments are sometimes called into question by the assessments made in countries using computer voting. As regards the security and secrecy of the ballot, various problems have arisen. First of all, the elector identification and voting processes are often linked, which undermines the principle of ballot secrecy. Consequently, in Belgium and the Netherlands, the authorities have decided to separate the two processes. In Belgium, voters identify themselves to the chief returning officer of the polling station and are then given a magnetic card to vote. After they have cast their vote, the card is transferred to an electronic ballot box before being wiped and reused (Federal Ministry for the Interior, Belgium, 2003).

In addition to those initial technical reserves, there is the problem of the material impossibility of checking

votes. In most cases, votes are counted by the computer as soon as the vote has been validated. That helps considerably to speed up the vote counting process and reduce costs in terms of human resources. However, recounts are then impossible. In order to overcome that problem, various solutions have been proposed, notably the "ticketing" solution, where a voting ticket is printed by the computer and collected in a sealed ballot box. Ticketing has been tested for instance in Belgium. It makes it possible to have a recount, either in the case of a problem or on a random basis in respect of a small percentage of votes. In other countries, the source code is given to the electoral authorities to allow the auditability of the voting system.

Finally, voting machines remain subject to technical uncertainties. Any failure can result in long queues, which may dissuade citizens from voting. In that case, the result is, of course, the opposite of that desired by the authorities (Detry, 2001).

From this initial survey, it can be observed that experiments with computer voting have dampened slightly the enthusiasm of the supporters of this new voting technique which is supposed to enhance considerably the security and rapidity of electoral arrangements.

Moreover, in addition to the reserves regarding counting, secrecy and accuracy highlighted during the various computer voting experiments, it also imposes a heavy financial burden on the authorities, because of the need to invest in equipment. Furthermore, the equipment cannot be used for other purposes (ICAVM, 2002). In addition, the changeover to computer voting cannot be seen as a purely technical operation. It is necessary, in any event, to adapt electoral laws accordingly (Bourgau, 2001). However, that stage is very often neglected (Detry, 2001). As a result, in Belgium, legal proceedings have been instituted on several occasions against the legislator. (EVA, 2003).

In addition, the introduction of computer voting has an impact on the electoral results themselves. Research carried out by the *Vrij Universiteit Brussel* (VUB) has shown that the positioning of candidate lists in columns on the screen tends to favour the candidates placed at the top and bottom of the column (Deschouwer, Buelens, & Heyndels, 2000). For example, the 2004 Brussels regional elections, when there were sometimes as many as 88 candidates on each French-speaking list, highlights the pertinence of that aspect.

It appears from a survey of the public and private reports on computer voting in Belgium, the Netherlands and UK, that the success of this method does not necessarily mean that this change in voting methods has been accepted unreservedly.

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