

# NEW TECHNOLOGIES: INESCAPABLE BUT CHALLENGING

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## NEW TECHNOLOGIES AND ELECTIONS

The invention of the *world wide web* in 1989 by Tim Berners-Lee at CERN in Geneva initiated a development that would profoundly change the way governments, business and people operate, interact and think their relations.

At the end of the 1990ties, as individual homes were getting increasingly connected to the internet thanks to broadband lines, governments took up the challenge and, from digitally blind, started to develop digital strategies addressing not only *how-to-cope-with* but also *how-to-benefit-from* questions.

The way technologies were going to affect democracy and the way democracy could benefit from the advantages they offered, was one of the very first issues that was considered. Many efforts and hopes poured on e-voting or the use of electronically-backed solutions to cast the vote in political elections. E-voting became a keyword for the deployment of ICT in the field of democracy. Efforts focused on developing electronically based solutions that allowed voters to vote via internet or on electronic devices at polling stations (including direct-recording-electronic machines or DREs and optical scanners).

E-voting risks were acknowledged but e-voting also brought big promises with it. By easing participation, it was hopefully going to increase turnout. Voters may still need to go to the polling station, but the use of electronics would make the exercise of their duty as citizens easier, quicker and more appealing. In addition, it would make life much easier for polling station workers and election administration in general. The Government was getting ready for the future. Demand, embrace and actual use were however going to be decisive. So would be security concerns.

Those hoping for increased turnout disenchanted soon. E-voting did not increase participation and did not push younger voters to vote. Hopes were (dis)placed on e-voting's capacity to stop a trend of continuing decrease in participation. Since the advent of social

media in 2005 (Facebook, Twitter, YouTube and the like) and their extensive use by millions of individuals throughout the world, the mobilizing effect of new technologies has however regained momentum.

Today however the accent is less on e-voting and more on data-driven voter-targeted election campaigns, political mobilization in big protest movements that make extensive use of social media and the use of data to make local governance more efficient and more democratic.<sup>1</sup>

E-voting security concerns and warnings took the center stage in recent years. Academia has been very active at least in two fronts: denouncing security holes in the design and implementation of e-voting systems used in practice, on one side, and in proposing solutions to specific challenges. States like Ohio, California, Florida in the U.S.A. have commissioned over a dozen independent scientific assessments of their electronic voting systems (e-voting machines and internet voting). Published reports have documented deficiencies related to these systems.<sup>2</sup> Research has proposed methods for verifying results on voting machines such as VVPAT.<sup>3</sup> Prominent e-voting IT specialists signed the 2007 Dagstuhl Accord advocating the use of end-to-end verifiable e-voting systems.<sup>4</sup> Verifiability solutions and e-voting systems built by researchers are regularly discussed at major e-voting conferences. Technical research has been very cautious and has insisted on the challenges that e-voting poses and which are not yet effectively addressed.

More recent revelations about surveillance practices by democratically-elected governments (Snowden revelations), or by less democratic ones (intrusions in security-sensitive systems attributed to Chinese or Russian hackers) certainly do not contribute to build trust in electronically-backed solutions (although no direct relation to e-voting has been alleged so far). For instance, an e-Government monitor survey conducted in Germany, Switzerland, Austria, UK, USA and Sweden in 2013 showed that users were losing

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<sup>1</sup> The Economist, special report "Technology and politics", Print edition 26 March 2016

<sup>2</sup> For a thorough review of these studies under a legal perspective see Hoke, C. "Judicial protection of popular Sovereignty: redressing voting Technology" in Case Western Reserve Law Review, Vol. 62 (2012). The author deplors that, to a very few and limited exceptions, no election law scholar has considered the legal import of these findings from top scientists.

<sup>3</sup> Also called Mercuri's method, VVPAT stands for Voter Verified Paper Audit Trail.

<sup>4</sup> <http://www.dagstuhllaccord.org/index.php>

confidence in e-government services following Snowden's revelations.<sup>5</sup> Also internet voting in Switzerland seemed to suffer from the NSA spying affair.<sup>6</sup>

Closer to elections and more recently, projectors have turned on the abusive use of big data (in combination with social media), to influence voters' opinions. Recent revelations of fraud in electoral campaigns were probably triggered by political turbulences of the ongoing presidential campaign in America.<sup>7</sup> In parallel, big data and social media are also being used to do good: improvement of local governance through public participation and political mobilization to influence decision-making even beyond national boundaries are two examples. Once again, technology seems to prove to us that it is *neither good, nor bad; nor is it neutral*.<sup>8</sup>

Two questions still. Is technology in elections as we know it today a novel issue, linked to electronics and the internet? What does history, including recent one, teach us about the challenging character of new technology in elections?

## **VOTING TECHNOLOGY PROGRESSES WITH DEMOCRACY AND SOCIETY**

Few scholars have researched the historical evolution of voting methods with the aim of better understanding e-voting.<sup>9</sup> The recent history of voting methods basically starts at the end of the 18th century, when democracy based on citizen participation as we know it today started to be introduced following American and French Revolutions.

Research shows that there have been several waves of technological change in voting, both in America and Europe, from early 19th century mechanical ballot boxes, to mechanical voting machines, to the rise of electronic computers in the 1960s, up to the introduction of DREs and Internet voting in the 1990s and 2000. Interestingly, the main reason for introducing technology was to fight fraud, quite extended especially in the 19<sup>th</sup> and in the first

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<sup>5</sup> <http://www.heise.de/newsticker/meldung/NSA-Affaere-Nutzer-verlieren-Vertrauen-ins-E-Government-2056450.html>

<sup>6</sup> <http://www.tdg.ch/suisse/evoting-souffre-affaires-despionnage/story/11165459>

<sup>7</sup> "How to hack an election", featured in Bloomberg Businessweek, April 4, 2016  
<http://www.bloomberg.com/features/2016-how-to-hack-an-election/>

<sup>8</sup> Melvin Kranzberg cited by The Economist, see footnote 1

<sup>9</sup> In Europe, Robert Krimmer's 2012 doctoral thesis *The Evolution of E-voting: Why Voting Technology is Used and How it Affects Democracy* deals with this issue from a broader international perspective. Philipp Richter's 2012 doctoral thesis and book *Wahlen im Internet rechtsgemäss gestalten* dedicates a chapter to the history of voting in Germany. In the U.S.A. the two notable examples include Roy G. Saltman's 2006, 2008 *The history and politics of voting and technology - In Quest of Integrity and Public Confidence* and Douglas W. Jones and Barbara Simon's 2012 *Broken Ballots - Will Your Vote Count?* Other historical elements are provided in the chapters respectively dedicated to Germany, Brazil, India, France, Mexico and Australia, in Driza Maurer, A. and Barrat, J. (eds) (2015) *E-Voting Case Law. A Comparative Analysis*, Routledge (Ashgate)

half of 20<sup>th</sup> century. Corrupted jurisdictions in the U.S.A. for instance resisted the introduction of voting machines.<sup>10</sup> The motivation for e-voting introduction was different though: it was to increase citizen participation. This time, technology is feared to open the door to fraudulent interventions.<sup>11</sup> Which explains the emergence of a rather recent phenomenon, the *auditing* of elections (keywords: election audits; verifiability methods).

E-voting technology appears to have kept pace with social needs (combat fraud, improve electoral processes, enable voters to participate) and technical knowledge and possibilities. To conclude on the question of the ineluctable use of contemporary technology in elections, we would say that, in a context of democratic citizen participation, to borrow from research, the *question is not if e-voting will be used in the future, but rather when it is going to be used.*<sup>12</sup>

## MULTIPLE CHALLENGES

Challenge is never in short supply in an e-voting context. It's even the very first commodity an e-voting project delivers, well before any of the promised advantages shows up. New technologies challenge the way the Parliament, the Government, the judge and the voter think about and deal with elections.

A look at the history of parliamentary interventions on e-voting in Switzerland,<sup>13</sup> an early but cautious adopter of internet voting,<sup>14</sup> shows what the main preoccupations of the e-voting legislator (and supervisor) have been and how did they evolve over the past twenty years.<sup>15</sup>

At the turn of the millennium, the preoccupation of MPs was to develop an information society identified as a value added to the country's competitiveness, a way to reinforce and personalize the relation between the State and citizen and a possibility to

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<sup>10</sup> Douglas W. Jones and Barbara Simon's 2012 *Broken Ballots - Will Your Vote Count?*, pp. 38ff.

<sup>11</sup> There are also cases where e-voting technology was adopted to fight fraud and succeeded in doing so. See the discussion of the Venezuelan case by Rubén Martínez Dalmau "Finding the Relationship between E-Voting and Democracy" in *E-Voting Case Law* (footnote 9).

<sup>12</sup> See Krimmer, R. (2012), fn. 9, p.28.

<sup>13</sup> See more detailed comments on e-voting development in Switzerland on my page [www.electoralpractice.ch](http://www.electoralpractice.ch)

<sup>14</sup> Switzerland introduced internet voting in 2002 for a limited part of the electorate with the aim of testing this technology. It's indeed the cantons who introduce and operation voting methods. Switzerland is a direct democracy where people are invited to vote an average four times a year in local, cantonal and federal questions in addition to elections. Postal voting is generalized, meaning all voters receive voting material at their domicile (no need for justification) and can decide whether to go to the polling station or return it by post. Some 90% of voters regularly choose the post. More on Government motivations to introduce e-voting can be found in their 2002 report <https://www.bk.admin.ch/themen/pore/evoting/07977/index.html?lang=en>

<sup>15</sup> All mentioned interventions can be found on the page of the Swiss federal Parliament <https://www.parlament.ch/fr>

amplify voters' involvement in governance.<sup>16</sup> An e-government strategy was introduced and e-voting was part of that development.

As e-voting started to function on a regular although restricted basis, parliamentarians looked at it as a solution for all sorts of identified needs. For instance, the Government was invited to promote e-voting and to add other interactive tools as a way to promote youth participation.<sup>17</sup> No significant increase in youth participation through e-voting has been registered so far, however other improvements were made. *Easyvote.ch* a voting information platform was created. It targets youth and explains complex questions submitted to popular vote in plain, youth like, language. In particular at the eve of federal elections it creates events to mobilize youth vote.

Another target group that mobilizes MPs attention are the Swiss abroad, a constantly growing group of and increasingly mobile population. They are allowed to participate at least at federal votes and elections and, depending on the canton, at cantonal and even local voting events. Government has been regularly asked to invite cantons to develop e-voting solutions for this part of the electorate.<sup>18</sup> The alternative postal voting does not ensure that their vote arrives in time and there is no "voting at the embassy" possibility for Swiss expatriates.

A third group with a major interest in the development of e-voting platforms are the sight-impaired. Here again, the federal Government has been asked to find means, among them e-voting, to ensure that they can participate in voting and their right to a secret vote is respected.<sup>19</sup> The challenge is to develop solutions for sight-impaired without lowering security standards. MPs have also called for the development of e-voting's potential to improve other democratic processes, such as the collection of signatures in popular referendums and initiatives.<sup>20</sup>

The Government's strategy of a step-by-step introduction of e-voting was occasionally challenged by MPs. The pace of its introduction<sup>21</sup> and the limitations (of 10% of federal electorate) in place were questioned in particular with a view to its costs.<sup>22</sup>

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<sup>16</sup> For an example see motion 00.3298, «E-Switzerland. Modifications législatives, calendrier et moyens»

<sup>17</sup> Parliamentary initiative 06.3538, Häberli-Koller, "Stimmbeteiligung Jugendlicher"

<sup>18</sup> For an example see Motion 07.3197, Leutenegger Oberholzer, "Vote électronique, notamment des Suisses de l'étranger"

<sup>19</sup> For an example see Interpellation 07.3630, Pascale Bruderer, "Accessibilité des sites Internet. Mettre en oeuvre la loi sur l'égalité pour les handicapés"

<sup>20</sup> For an example see Motion 08.3908, Jacqueline Fehr, "Renforcer la démocratie. Autoriser la récolte électronique de signatures"

<sup>21</sup> For an example see Question 07.5076, Guisan Yves, "Vote électronique. Introduction aux calendes grecques?"

<sup>22</sup> For an example see Question 07.5237, Graf-Litscher, "Vote électronique"

Around 2007/8 several e-voting initiatives in Europe experienced difficulties and were (being) stopped for example in Ireland, the United Kingdom, the Netherlands or Germany.<sup>23</sup> Swiss MPs became more attentive to the constitutional conformity of e-voting, which was also reflected in their interventions. E-voting triggered a reflection on voting procedures, especially on distant voting. Issues such as transparency of procedures,<sup>24</sup> risk of electoral fraud,<sup>25</sup> reliability of results of voting from uncontrolled environments,<sup>26</sup> were brought forward.

Since, e-voting risks and related security measures have taken central stage in parliamentary debates.<sup>27</sup> The Government has been invited to reflect on the introduction of open source solutions,<sup>28</sup> transparency of audit reports, publication of source code, etc. Most issues are of cantonal competence however federal guidance and minimum common requirements are needed.

More recently alleged hacking and other incidents have been questioned.<sup>29</sup> In addition to transparency, open source,<sup>30</sup> verifiability has entered the debate.<sup>31</sup> There is even an invitation to the Government to organize a mock vote and invite the community to hack the systems.<sup>32</sup> The implementation of the OSCE/ODIHR recommendations following the 2011 and 2015 federal elections is also discussed.<sup>33</sup>

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<sup>23</sup> For a summary of developments at the regional level see Driza Maurer, A. (2013) "Report on the possible update of the Council of Europe Recommendation Rec(2004)11 on legal, operational and technical standards for e-voting, 29 November 2013"

<sup>24</sup> For an example see Parliamentary Initiative 08.486, Joseph Zisyadis, "Inscription de la transparence de vote dans la Constitution fédérale"

<sup>25</sup> See Postulat 09.3174, Rennwald, "Votations et élections. Attention à la fraude"

<sup>26</sup> See Interpellation 09.3573, Baettig, "Légitimité et fiabilité du vote par correspondance et du e-voting"

<sup>27</sup> Examples are Interpellation 10.3251, Luc Recordon, "Risques démocratiques inhérents au vote électronique"; Interpellation 12.3262, Luc Recordon, "Fiabilité et crédibilité du vote électronique"

<sup>28</sup> For examples see, Interpellation 12.3288, Jean-Christophe Schwaab, "Vote électronique. Stimuler l'innovation pour garantir la sécurité"; Interpellation 09.3495, Christian Wasserfallen, "Projets de cyber-administration. Utilisation de logiciels libres".

<sup>29</sup> For a summary of developments and related parliamentary interventions in 2013, see my post <http://www.electoralpractice.ch/2013/09/client-side-viruses-and-internet-voting>. For a more recent example see Question 15.5151, Maximilian Reimann, "Votation populaire fédérale du 8 mars 2015. Panne lors du dépouillement des suffrages électroniques exprimés par des Suisses de l'étranger"

<sup>30</sup> See Motion 15.4237, Lukas Reimann, "Vote électronique. Transparence indispensable"

<sup>31</sup> See Motion 13.3808, Jean Christophe Schwaab, "Pas de précipitation en matière d'extension du vote électronique" and Motion 13.3812, Balthazar Glättli, "Kein unsicheres E-Voting. Nur Systeme mit Verifizierbarkeit und offenem Source Code zulassen".

<sup>32</sup> Question 15.5372, Jean Christophe Schwaab. Pour un test grandeur nature à blanc du vote électronique

<sup>33</sup> For a recent example see Interpellation 15.4167, Masshardt Nadine, "Missions d'observation électorale de l'OSCE. Mise en oeuvre des recommandations". See also Interpellation 15.3331, Kiener Nellen, "Où en est la mise en oeuvre des recommandations de la mission d'évaluation électorale du BIDDH de l'OSCE dans la perspective des élections fédérales de 2015?"

Cooperation with private actors that provide e-voting services (and trust placed in them) gained momentum last year. A number of interventions question the meaning of a public voting system and its transparency,<sup>34</sup> or the fact that some private providers are based abroad.<sup>35</sup>

A decision by the federal Court basically leaving it to the political system, informed by academia, to decide on the merits of e-voting<sup>36</sup> has prompted parliamentary reaction.<sup>37</sup> It was suggested that cantons set-up bodies for reviewing appeals related to the way an e-voting system is designed.

Costs remain an issue<sup>38</sup> as well as offering e-voting to all Swiss abroad in the near future.<sup>39</sup> The Government has been reticent to force the hand of cantons and to oblige them to introduce e-voting for specific groups. It has instead put the accent in improving the federal regulatory framework and in supporting cantons willing to do e-voting (half of them) to develop their systems towards second-generation ones that offer individual and universal verifiability. The Government is now examining conditions for putting an end to the long period of trials (with binding results) of e-voting which started in 2002. As an MP recently put it, e-voting will eventually come, no use then of making it compulsory.

## **FUTURE'S YET TO COME**

Very much depends on how e-voting will be framed and controlled by Parliaments, how it will be piloted by Governments and how public-private cooperation in this area evolves. It will further depend on whether voters show interest to check the results and make use of verifiability techniques that are being offered them. So far, as research shows, laws have not kept pace with the enormous changes in how elections are being run.<sup>40</sup> This is true for the region and this is true not only for legislation but also other aspects.<sup>41</sup> Given the

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<sup>34</sup> Motion 15.3492, Christian Darbellay, "Pour un système de vote électronique public et transparent"; Question 15.5466, Cédric Wermuth, "Engagement de la Poste dans le développement d'une plate-forme de vote électronique"

<sup>35</sup> Question 15.5463, Peter Keller, " Le Conseil fédéral doit-il vraiment subventionner un système de vote électronique supplémentaire réalisé avec des collaborateurs étrangers?"

<sup>36</sup> See the discussion on this case in the chapter on Switzerland, by Beat Kuoni in E-Voting Case Law (footnote 9)

<sup>37</sup> Parliamentary initiative 15.412, Reimann Lukas, "Les modalités du vote électronique doivent pouvoir faire l'objet d'un examen juridique"

<sup>38</sup> Interpellation 15.3634, Christian Levrat, "Vote électronique"

<sup>39</sup> Instead of many, see Motion 15.4260, Filippo Lombardi, "Introduction du vote électronique pour tous les Suisses de l'étranger d'ici à 2019 au plus tard"

<sup>40</sup> Jones and Simons, fn. 9, p.7

<sup>41</sup> Driza Maurer, A. "Update of the Council of Europe Recommendation on Legal, Operational and Technical Standards for E-Voting – A Legal Perspective" in Tagungsband IRIS 2016

sensitive character of election procedures, any changes in this area, be it in legislation, authorities' practice or voters' habitudes will take time.

Authorities in charge of studying or introducing e-voting look for benchmarks. With this regard, pioneering work of the Council of Europe in establishing soft-law standards for e-voting in the region is a welcomed step forward.<sup>42</sup> The Recommendation of the Committee of Ministers to member States on legal, operational and technical standards for e-voting, also known as Rec(2004)11, was adopted more than ten years ago by the Committee of Ministers. In 2010, two Guidelines were elaborated providing additional requirements on certification and transparency issues, only briefly dealt with in the Recommendation. The update of all these documents is now being considered by CAHVE – the ad-hoc Committee of Experts on E-voting set up by the Council of Europe in 2015.<sup>43</sup>

Researchers note that the fundamental problems faced by election officials over the past 150 years have not changed. As each new voting technology is adopted, there is an initial period of enthusiasm before flaws begin to emerge.<sup>44</sup> E-voting is no exception. With such multiples challenges present, one is attempted to ask: is the game worth the candle? Is it worth pursuing e-voting or more broadly new technology in elections or should we forget about them? Let's put the question a bit differently: do we really have a choice?

Back to Switzerland. It is considered one of the most democratic countries because the direct democracy institutions of referendum and initiative are well developed and extensively used at the three levels: federal, cantonal and local. 90% of voters use the postal voting channel. Participation in votes is relatively low (between 40 and 50%) but given the fact that voters are invited to vote an average four times a year, on, often very complex questions, this is not bad. Switzerland is also one of the countries with highest internet penetration rates. The Post, which transports vote envelopes, has become a private company and is transferring most of its activities online. Does the Swiss Government really have the choice to ignore the e-voting method (knowing that this method is explored in a step-by-step manner, placing security before speed and using e-voting only as an additional voting channel)?

This is certainly not an invitation to succumb to pressure exercised by e-voting vendors. Neither is it an invitation to precipitate the introduction of e-voting as a way for

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<sup>42</sup> Wenda, G. "CAHVE: Das neue Ad-hoc-Komitee des Europarates für E-Voting" in Tagungsband IRIS 2016

<sup>43</sup> More on CAHVE: [http://www.coe.int/t/DEMOCRACY/ELECTORAL-ASSISTANCE/news/2015/CAHVE2910\\_en.asp](http://www.coe.int/t/DEMOCRACY/ELECTORAL-ASSISTANCE/news/2015/CAHVE2910_en.asp). The author of this paper is the nominated leading legal expert of the ad-hoc Committee of Experts on E-voting (CAHVE) created in April 2015 at the Council of Europe.

<sup>44</sup> Reference fn.10, p. 7



governments to appear modern. The answer is more complex. Probably it's to be found in the country's project for democracy. A lot will then depend on specific local needs and developments. High-technology *can* be designed to help that project.