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Report:
Internet Voting: Looking Towards the Future

By

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I. Introduction

Over the past year both my 60-year-old father and 95-year-old grandfather joined the social networking website Facebook. After recovering from the shock of receiving their friend requests, I began thinking about the changes brought about by the Internet and its potential to radically transform communication in the future. For example, Internet technology played a vital role in the recent 2008 Presidential Election.[1] From YouTube to Twitter, Barack Obama successfully utilized the Internet to organize supporters, and in the process reshaped American politics.[2]

As technology becomes increasingly integrated into our daily lives, many countries are discussing the possibility of using the Internet for voting.[3] In fact, some countries have already successfully employed Internet voting in recent elections.[4] In 2007, Estonia became the first country to hold an online General Election; 30,000 voters cast their ballots electronically.[5] Voters in Switzerland have also successfully participated in online federal elections.[6] Additionally Austria, Canada, France, Germany, Spain, the Netherlands, and the United Kingdom are each working to develop and implement remote voting programs.[7]

In America, however, the concept of electronic voting continues to invoke fear. Although the Democratic Party successfully used Internet voting for the 2000 Arizona Presidential Primary,[8] and the 2004 Michigan Presidential Primary,[9] the technology has not been used since. Additionally, in 2004, the United States briefly entertained the idea of using remote Internet voting to allow expatriates and overseas military personnel to more easily participate in the 2004 Presidential Election. This idea was quickly abandoned, however, when the Department of Defense issued a report pronouncing the security risks of Internet voting "insurmountable."[10]

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[1] Claire Cain Miller, *How Obama's Internet Campaign Changed Politics*, The NY Times Technology Blog, http://bits.blogs.nytimes.com/2008/11/07/how-obamas-internet-campaign-changed-politics/ (accessed Apr. 10, 2009).
[2] *Id.*
[3] *Estonia Claims New E-Voting First*, BBC News, Mar. 1, 2007, http://news.bbc.co.uk/go/pr/fr//2/hi/europe/6407269.stm (accessed Apr. 15, 2009) (Internet voting was offered as one voting option among many.).
[4] *Id.*
[5] *Id.*
[6] *Id.*
[7] ACE Electoral Knowledge Network, *Countries With E-Voting Projects*, http://aceproject.org/ace-en/focus/e-voting/countries (accessed Apr. 1, 2009). [hereinafter *Countries With E-Voting Projects*]
[8] Scott Thomsen, *State Democrats Set Up Online Primary Election Is 1st of its Kind, Party Officials Say, Ariz. Rep.*, Jan. 15, 2000 at B4. "The primary turnout set a record as the largest since the Democratic Party began conducting primaries in 1984. ... All but three of the thirty-eight voting districts within Arizona's fifteen counties had increased voter turnout that exceeded a three hundred and fifty percent increase from the 1996 election year." Andre M. Chernay, *Analysis of Internet Voting Proposals*, Cal. Init. Rev. (2000) (citations omitted).
[9] Katharine Q. Seelye, *The 2004 Campaign: Online Voting; Michigan's Online Ballot Spurs New Strategies for Democrats*, The NY Times, Jan. 10, 2004, http://www.nytimes.com/2004/01/10/us/2004-campaign-online-voting-michigan-s-online-ballot-spurs-new-strategies-for.html?sec=&spon=&pagewanted=all (accessed Apr. 15, 2009).
[10] David Jefferson, Aviel D. Rubin, Barbara Simons, & David Wagner, *A Security Analysis of the Secure Electronic Registration and Voting Experiment (SERVE)*, Jan. 21, 2004, http://www.servesecurityreport.org/paper.pdf (last accessed Apr. 19, 2009) [hereinafter *SERVE Security Analysis*].

In the 2008 General Election only 49.4 percent of the voting-eligible population in California turned out to vote.[11] Further, even though the Democratic primary was hotly contested, only 40 percent of California's voting-eligible population participated in the 2008 Primary Election.[12] And in the 2006 General Election, only a dismal 32.2 percent of the voting-eligible population in California turned out to vote.[13] Indeed, these numbers are typical across America.

Internet voting has the potential to increase voter turnout—thereby increasing participation in the democratic process and better communicating citizens' priorities to their representatives—but this technology is not without problems. Proponents of Internet voting argue that increased voter convenience, increased voter turnout, cost savings, faster ballot counting, and quicker election results are reasons for adopting this technology.[14] On the other hand, opponents of the technology argue that online voting threatens the "basic principles of secrecy . . ., anonymity, fairness, accuracy, and transparency."[15] At the crux of the debate are concerns about (1) voter identification, and (2) maintaining public confidence in election integrity. Accordingly, this article explores those concerns; ultimately concluding that Internet voting is something Americans should get ready to embrace in the future.

II. Background Information

Safe, effective and reliable elections are vital to any democracy. Over the years, as the available technology has changed, U.S. election administration has evolved significantly. For example, until the invention of the printing press, ballots were handwritten; similarly, fountain pens were not available until the late 1800's. Likewise, the invention of electricity, electronic typewriters, better printing presses, and later computers have all played a role in making elections more efficient and more accessible.[16]

Paper ballots are "relatively easy to produce, easy to mark and easy to count," making them an attractive choice for elections. Paper ballots, however, are also "quite expensive to print and distribute, they can only be used once, and they are not a particularly good use of resources."[17] Moreover, "[c]ounting paper ballots manually, although relatively reliable can prove cumbersome and prone to errors."[18] Indeed, the 2000 U.S. Presidential Election provided a public display of many of the pitfalls of using paper ballots.

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[11] United States Elections Project, *2008 General Election Turnout Rates*, http://elections.gmu.edu/Turnout_2008G.html (last accessed Apr. 15, 2009).
[12] United States Elections Project, *2008 Presidential Nomination Contest Turnout Rates*, http://elections.gmu.edu/Turnout_2008P.html (accessed Apr. 15, 2009).
[13] United States Elections Project, *2006 General Election Turnout Rates*, http://elections.gmu.edu/Turnout_2006G.html (accessed Apr. 15, 2009).
[14] ACE Electoral Knowledge Network, *Internet Voting*, http://aceproject.org/aceen/topics/et/eth/eth02/eth02b/eth02b4 (accessed Apr. 19, 2009) [hereinafter *Internet Voting*].
[15] *Id.*
[16] ACE Electoral Knowledge Network, *Context of Elections and Technology*, http://aceproject.org/aceen/topics/et/et30 (accessed Apr. 19, 2009).
[17] ACE Electoral Knowledge Network, *The Future of Elections and Technology*, http://aceproject.org/aceen/topics/et/etj (accessed Apr. 10, 2009).
[18] *Id.*

Starting in the 1990's, with the emergence of popularity of the Internet, people have speculated about the possibility of implementing Internet voting. For example, in 1998, the New York Times proclaimed that Internet voting was "Not Around the Corner, but on the Horizon."[19] Over the past decade various experts have conducted studies on the feasibility of secure Internet voting. The results of such studies and experiments have been mixed—which is presumably one important reason Americans have been hesitant to embrace this technology.[20]

III. Voter Identification

The concept of "one person, one vote" is fundamental to American society.[21] This simple statement of the legal standard, however, fails to articulate its true complexity. In truth, various burdens can be placed on the right to vote; for example, children cannot vote, in many states felons cannot vote, and eligible voters must be registered. Voter identification (sorting eligible voters from ineligible voters), therefore, plays a vital role in ensuring election integrity.[22]

Across America, voter identification laws vary drastically, yet voter fraud has historically been exceedingly uncommon;[23] when people consider adopting Internet voting, however, concerns about voter identification and voter fraud are renewed. As various countries across the globe adopt (or prepare to adopt) Internet voting technology, they each have settled on different systems for voter identification. Leading the way are Estonia, Switzerland, Austria, and Canada.

Estonia. In Estonia, each citizen has a government issued identification card containing an "integrated electronic chip" allowing secure remote authentication.[24] These cards are used not only for voting, but also for "drivers' licenses, library cards, and other essential services."[25] Remote online voting is conducted several days in advance of Election Day. Once the advance voting period ends, "a list of citizens who have voted electronically is complied and sent to polling stations" to prevent double voting.[26]

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[19] Rebecca Fairley Raney, *Voting on the Web: Not Around the Corner, but on the Horizon*, Sept. 17, 1988, available at http://www.nytimes.com/1998/09/17/technology/voting-on-the-web-not-around-the-corner-but-on-the-horizon.html (accessed Apr. 10, 2009).

[20] *Internet Voting*, *supra*. See *also* Tadayoshi Kohno, Adam Stubblefield, Aviel D. Rubin, & Dan S. Wallach, *Analysis of an Electronic Voting System*, IEEE Symposium on Security and Privacy 2004, Feb. 27, 2004, http://www.avirubin.com/vote.pdf (accessed Apr. 19, 2009) (discussing security risks associated with paperless electronic voting machines); *SERVE Security Analysis*, *supra* (concluding that Internet-based voting systems are too vulnerable for use in binding elections).

[21] Reynolds v. Sims, 377 U.S. 533 (1964).

[22] ACE Electoral Knowledge Network, *Technologies with Electoral Applications*, http://aceproject.org/aceen/topics/et/eta (accessed Apr. 10, 2009).

[23] Kathryn L. Patterson, *Voter Fraud vs Voter Suppression: A Refocus in Values*, Cal. Init. Rev. (Fall 2008), http://www.mcgeorge.edu/Documents/centers/government/Voter_Fraud_and_Suppression_Report.pdf (accessed Apr. 22, 2009).

[24] Richard Twigg, *Europe's Experiments in E-Voting*, Feb. 28, 2008, International Foundation for Electoral Systems, http://www.ifes.org/features.html?title=Europe%25s%20Experiments%20in%20E-Voting (accessed Apr. 10, 2009).

[25] *Id.*

[26] *Id.*

Switzerland. In Switzerland, registered voters receive voting cards by mail before each election. (This was true even before Internet voting was implemented.) To facilitate voter identification for Internet voting, a scratch-off metallic strip under which a unique "voting number" is found was added to the voting cards. Swiss citizens use their voting card regardless of whether they vote in-person, by mail or online. If voting online, the person accesses the voting system through a normal web browser; to gain access to a "secure electronic polling booth and submit their vote," the voter must enter their unique voting card number.[27]

Austria. Though Austria has not yet implemented remote Internet voting in a legally binding election, several tests have been conducted. Citizens of Austria each have an Austrian electronic National Id Card (Bürgerkarte). In order to vote online it is expected that voters will be required to apply for an "electronic voting token" prior to Election Day. The electronic voting token would be saved on the electronic National ID Card; on Election Day, the voter would submit their token to gain access to online voting.[28]

Canada. Like Austria, Canada has not used online voting technology in a national election, though it has been used in some municipal and school board elections. Under the Canadian system, each voter receives a unique "Voter Identification Number" and a unique password, which they were able to use for either Internet or touch-tone telephone voting.[29]

In America elections are administered by each individual state. For that reason, election related laws (including voter identification laws) differ across the nation. For example, voter identification laws in California require only self-identification, while Indiana law requires voters to present a government issued identification card.[30] Further, unlike Estonia and Austria, Americans are not issued national identification cards,[31] so each state would have to individually evaluate which of these methods (or another method entirely) would work best for their voters.

In California, for example, prior to each election voters already receive a sample ballot and a Voter Information Guide through the mail. Given that fact, California could potentially adopt a system similar to the one employed in Canada (sending each registered voter with a unique identification number for each election) with relatively few changes to the existing system. Adopting such administrative changes to accommodate online voter identification concerns would not be an insurmountable obstacle to Internet voting.

IV. Election Integrity

A successful democracy requires participation in elections and confidence in the electorate that election results represent the will of the people. To that end, in addition to ensuring that only

[27] *Id.*
[28] *Countries With E-Voting Projects*, *supra*.
[29] *Id.*
[30] Patterson, *supra*.
[31] Although Congress passed the Real ID Act of 2005 requiring state drivers' licenses and identification cards to comply with national standards, to date no state has implemented the legislation. *See* Jaikumar Vijayan, *Obama Will Inherit A Real Mess on Real ID*, Computer World, Dec. 22, 2008, http://www.infoworld.com/d/security-central/obama-will-inherit-real-mess-real-id-528 ("Real ID program, the three-year-old effort to impose identification-card standards on state governments, remains mired in controversy")

eligible voters cast ballots, election integrity requires that elections are secret, fair, accurate, and transparent. Proponents of Internet voting argue that various techniques such as code visibility,[32] network and data encryption,[33] and implementing a system of checks and balances would accomplish those goals secure enough to provide fair elections.[34] However, critics argue that the necessary technology simply does not currently exist to ensure that these goals would be met. Moreover, first impressions matter, opponents argue, and the government would only get one opportunity to attempt Internet voting; if the experiment is successful voter confidence would increase, but if it fails, voter confidence might be destroyed.[35]

In their 2004 report, the United States Department of Justice (DOJ) identified five threats to election integrity that they considered heightened in the context of Internet voting: (1) disenfranchisement; (2) modification of a voter's ballot by a third party; (3) privacy; (4) voting more than once; and (5) vote buying, selling, and trading. In support of such assertions, the DOJ makes several key points. First, the DOJ argues that because there is no "voter-verified audit trail," voters cannot be confident their vote was correctly recorded.[36] Second, the DOJ implies that with Internet voting, privacy would be illusory.[37] Third, the DOJ distinguishes small-scale voter fraud potentially perpetrated under absentee voting systems, from the large-scale voter fraud that would be possible with Internet voting.[38] In concluding that Internet voting should not be adopted, the DOJ emphasized that final point by stressing that large-scale, undetectable fraud could occur from anywhere in the world.[39]

At this time, a report definitively declaring Internet voting secure against all potential attacks cannot be found. Further, even the countries that have adopted Internet voting do not claim that such technology is without vulnerabilities. Although it is clear that Internet voting has many potential benefits, presently Internet voting presents a serious risk to voter confidence in election integrity.

V. Conclusion

Admittedly, Internet voting is not currently risk-free. Moreover, realistically, regardless of future technological improvements, security risks associated with online voting will always remain. Indeed, skepticism in America of Internet voting is understandable; however, foreclosing on the possibility of someday adopting this technology in America is not.

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[32] ACE Electoral Knowledge Network, *Public Assurance Measures*, http://aceproject.org/ace-en/topics/et/etc/etc08 (accessed Apr. 10, 2009) (publishing the "code used for electoral computer programs so that they can be independently [analyzed]").

[33] Rolf Oppliger, *Addressing the Secure Platform Problem for Remote Internet Voting in Geneva*, May 3, 2002, http://www.geneve.ch/evoting/english/doc/rapports/rapport_oppliger_en.pdf (accessed Apr. 19, 2009) (". . . the secrecy and integrity of the ballots can be addressed with the Secure Sockets Layer (SSL) or Transport Layer Security (TLS) protocol").

[34] *Id.*

[35] *Computer Technologists' Statement on Internet Voting*, http://verifiedvoting.org/downloads/InternetVotingStatement.pdf (accessed Apr. 15, 2009).

[36] *SERVE Security Analysis*, *supra*.

[37] *Id.*

[38] *Id.*

[39] *Id.*

Americans are asked to vote more frequently than voters in any other country.[40] Online voting would make participation in elections more convenient and accessible, thereby increasing voter-turnout and facilitating better communication between representatives and their constituents. Adopting this technology will require striking a balance between optimizing voter convenience and participation, and maintaining the integrity and secrecy of elections. Adopting this technology will not (and should not) happen overnight. However, it is time we started getting ready for the future—it is time we started planning out how to make Internet voting work in the future, instead of focusing on why it will not work right now.

[40] Michael McDonald, *5 Myths About Turning Out The Vote*, Oct. 29, 2006, The Washington Post, http://www.washingtonpost.com/wp-dyn/content/article/2006/10/27/AR2006102701474.html (accessed Apr. 15, 2009).