
Is Now the Time for Internet Voting?: BC's Independent Panel on Internet Voting

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British Columbia's Independent Panel on Internet Voting examined research exploring the merits and drawbacks of Internet voting. The author, who chaired of the panel, reports on its terms of reference, key evidence and its conclusions and recommendations. He notes that at the present time, the benefits of Internet voting are limited while the challenges of successfully implementing Internet voting are many and complex. The panel has recommended against universal Internet voting at the present time and suggested that if it is implemented it should be limited to people with specific accessibility challenges, co-ordinated province-wide, employ independent technical experts and be measured against the key principles established by the committee.

Following an invitation of the Minister of Justice and Attorney General, the Independent Panel on Internet Voting (the panel) was formed by the Chief Electoral Officer of British Columbia on August 9, 2012 to examine opportunities and challenges related to the potential implementation of Internet-based voting in provincial or local government elections in BC. The panel met between September 2012 and October 2013, reviewed the existing and evolving literature and spoke to a variety of experts in the fields of technology, Internet security and electoral administration. The panel examined research detailing both the benefits of and challenges to implementing Internet voting and heard from experts strongly in favour of and strongly opposed to the idea of implementing Internet voting in BC. The panel published a preliminary report in fall 2013 and a final report with recommendations to the Legislative Assembly in February 2014. This paper reviews the composition and terms of reference of the panel, reviews the key evidence it considered, and reports on its conclusions and recommendations.

Context

Many jurisdictions in Canada and elsewhere have considered implementing Internet voting for public elections. Perhaps the most notable observation is not on how many jurisdictions have introduced and

continue to use Internet voting, but rather how few of them have done so. Notwithstanding the widespread adoption of various forms of information technology in many aspects of modern life, from banking to shopping to dating, there has been a relatively slow take-up in using the public Internet for public elections in most of the world's democracies. Proponents of Internet voting often point to cases in which Internet voting has been used in public elections as evidence that existing technology provides the requisite privacy and security provisions. Opponents of Internet voting, in contrast, often focus on the fundamentally different challenge provided by election administration in comparison with other aspects of technology's use, particularly the need to separate an individual's personal identity with their vote, as a principal reason that Internet voting does not provide the level of integrity that paper ballots do. The purpose of BC's Independent Panel on Internet Voting was to get beyond the rhetoric and examine the reality of Internet voting.

Three key developments led to the forming of the Independent Panel on Internet Voting. In March 2011, the City of Vancouver requested approval from the Minister of Community, Sport and Cultural Development to use Internet voting for the November 2011 Local Government Elections. Vancouver's elected officials and administration were aware that Internet voting was permitted in local elections both in Ontario and in Nova Scotia, and wished to have similar authority to use Internet voting in their jurisdiction. The request was not granted and the 2011 Local Government

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Elections were held in the traditional manner. In August 2011, Elections BC submitted *Discussion Paper: Internet Voting* to the Legislative Assembly to further public dialogue on the topic, and in November 2011, the Chief Electoral Officer submitted the *Report of the Chief Electoral Officer on Recommendations for Legislative Change* to the Legislative Assembly. Of the four recommendations in the report, one entitled “Trialing New Voting Technologies” suggested that “legislators may wish to consider providing greater flexibility to the Chief Electoral Officer to introduce, on a pilot basis, a variety of new voting technologies.” This recommendation was intended to cover a host of technologies including, but not limited to, Internet voting and to increase the possibilities for further detailed assessment of new voting technologies in BC.

Forming/composition/process

In August 2012, the Minister of Justice and Attorney General invited the Chief Electoral Officer to convene a non-partisan panel to review best practices with respect to Internet voting in other jurisdictions and to examine the issues associated with implementing Internet voting in BC. The request included that the panel examine Internet voting in both local and provincial contexts. The five panellists, selected by the Chief Electoral Officer, had lived and worked in BC and were selected based on their expertise and experience. Two were university professors with experience in computer science, computer engineering and computer and network security. One was a local government administrator with experience in elections, and one was a former Auditor General. The Chief Electoral Officer chaired the panel.

The panel reviewed some of the academic and practitioner literature on Internet voting, received presentations from experts on a variety of topics and reviewed the actual and perceived benefits and challenges to the implementation of Internet voting.

In fall 2013, the panel released a preliminary report that provided the public with a research summary of both the benefits and challenges to implementing Internet voting for provincial or local government elections in BC, and outlined the panel’s preliminary conclusions and recommendations. The preliminary report was available on the panel’s website and the panel invited public comment from BC residents for a six-week period concluding December 4, 2013.

During that period the panel received input from over 100 individuals from across BC. Of the comments in favour of Internet voting, common themes included: the potential for increased convenience and the removal

of barriers for people with accessibility challenges; the need for voting to keep up with an increasingly digital lifestyle; and anecdotal evidence that Internet voting would lead to increased voter turnout. Of the comments opposed to Internet voting, common themes included: concerns about Internet security generally and the potential for compromised election results because of security challenges; a lack of trust in results that aren’t scrutinized in the traditional manner; and a feeling that if Internet voting won’t improve voter turnout, it is not worth the risk.

In addition to comments from BC residents, the panel also received input from experts in the field of Internet security outside of BC, as well as from vendors of Internet voting technologies, and groups representing persons with disabilities in BC. Following a consideration of public input, the Report was finalized and submitted to the Legislative Assembly in February 2014.

Definition and Scope

The panel limited the scope of its work to remote Internet voting. Accordingly, both on-site Internet voting and the use of electronic voting and counting machines in the voting place were out of scope. The panel also limited the scope of its research to the use of Internet voting in governmental elections.

Perceived and actual benefits of Internet voting

A considerable part of the panel’s work involved reviewing evidence with respect to purported advantages and challenges of Internet voting. The material was gained through reviewing the vast literature on the topic of Internet voting, speaking with experts, receiving input from vendors, and examining circumstances for cases in which Internet voting either has been adopted and implemented or considered and rejected. This section briefly reviews some of the key evidence and arguments. Readers can refer to the panel’s full report for more details and additional purported benefits.

Increase voter turnout

The last generation or two has witnessed a substantial decline in voter turnout in many jurisdictions. Research has shown that much of the drop in turnout is owing to the declining participation of young voters. Proponents of Internet voting often identify increasing youth voter turnout as a key reason for its adoption.

However, the evidence on this topic suggests otherwise. There is no consistent increase in voter turnout in jurisdictions that adopt Internet voting – in some it increases, in others it decreases, and in still

others it is unchanged. Furthermore, the evidence shows that those who do vote online, when given the option to do so, are generally from the middle-aged or older demographic. In other words, Internet voting appeals to groups of voters who already have higher rates of participation. The evidence leads to the conclusion that the absence of Internet voting is not the cause of declining turnout and its availability is not the solution.

Increase accessibility/convenience

The argument that Internet voting is more convenient than traditional voting has been offered as another reason to adapt voting methods. However, the extent to which this is true varies by the circumstance of the voter. For out-of-province voters and voters with accessibility challenges, such as those with limited mobility or with other physical impairments, Internet voting may provide a significant benefit.

However, even for these voters, the level of convenience depends upon the security requirements in place to access the voting system. If it can be accessed readily by documents or passwords already held or known by the voter, then Internet voting may have a convenience advantage. If voters must register separately from voting, the complexities of the registration process may decrease this advantage. In any case, however, the panel concluded that the enhanced convenience of Internet voting for most voters is quite limited, and would not on its own justify adopting an Internet voting system.

Cost savings

Whereas increasing voter turnout is referred to by most proponents of Internet voting, saving money in administering elections is the other principal rationale. At present it is difficult to assess the degree to which an Internet-only vote would save money since most jurisdictions that have adopted Internet voting in Canada offer it only during advance voting, while traditional paper balloting is used on General Voting Day. When both voting methods are offered, it is often the case that Internet voting does not produce cost savings. Instead, it either adds costs, or requires fewer voting places on General Voting Day to keep costs neutral.

Taken together, evidence related to the purported advantages of Internet voting fail to provide a compelling case for its adoption. One might argue that in the absence of substantial risk associated with Internet voting, the rather modest advantages of Internet voting would still justify its use. However, the

risks inherent with Internet voting at present are both substantial and significant.

Perceived and actual challenges of implementing Internet voting

Perception of the challenges or risks of implementing Internet voting differs among stakeholders. Vendors claim that the challenges have largely been overcome and the risks are minimal, whereas most technical experts state that ongoing concerns related to security are still to be resolved.

The kinds of risks involved in Internet voting are largely different from the kinds of risks associated with traditional voting opportunities. The degree of risk and the consequences of those risks also differ and require assessment. While there are accepted standards for assessing safety-critical systems generally, to date there is no common methodology for measuring the risks associated with Internet voting. The following examines some of the key challenges reviewed by the panel.

Security

Concerns about the security of Internet voting arise at three distinct points in the voting process. There are security risks at the voter's device, in the transmission of the vote from the voter's device to the election administration server, and in the server itself. Research has demonstrated that a significant number of personal computer devices are infected with malware, and it can be expected that the interest and activity in malware production will continue. Higher profile elections may be particularly attractive to those intent on subverting the democratic process by attacks on voters' computers. And yet, many election authorities that use Internet voting take no responsibility for ensuring the integrity of a voter's computer (or other device). This introduces an important risk to Internet voting.

The transmission of the vote over the public Internet to the election administration server is a second point of vulnerability and risk. A number of vendors use encryption of voted ballots to enhance security to this vulnerability. Although analysts often identify this as the strongest area of protection, recent revelations about widespread access to private materials and emails on the public Internet dampen confidence that this security is foolproof.

And third, there is the risk associated with the election administration server. Recent experience with the successful hacking of the election server in Washington D.C. by a professor and his students serves as a reminder of the myriad possible points of



Although Internet voting may be perceived as a way to increase voter turnout, increase accessibility and convenience of voting and save money, BC's Independent Panel on Internet Voting concluded the absence of Internet voting is not a reason for declining voting rates, increased accessibility and convenience would be tempered by registration complexities and Internet voting would actually be cost-neutral or increase expenses.

attack in the complex computer code of an Internet voting system. In short, the security challenges are substantial for Internet voting, and each jurisdiction must be wide-eyed in establishing its risk tolerance in adopting an Internet voting system.

Transparency and auditability

One of the major strengths of the paper-based voting system is the transparency of administration, and the auditability of results. If there is a close contest, the ballots can be recounted either by the election officials, or by a judge, or both. And, the casting and counting of ballots is done in a public space, with candidate and political party representatives able to observe the process. Voting is much less of a public exercise with Internet voting. It tends to occur in a private place, and can occur anywhere in the world for any given jurisdiction. Since there is often no paper trail associated with the vote, the audit function is performed very

differently – generally by technical experts examining computer code and processes, not political volunteers examining voters and election officials. The code used to operate Internet voting software is highly detailed and complex, and is generally not available for auditing purposes. Hence, transparency and auditability are fundamentally altered in an Internet voting environment.

Cost

Although reducing the cost of elections was listed in the section regarding the advantages of Internet voting, the discussion there indicated that cost savings are not inevitable with Internet voting, particularly when it is offered only during the advance voting period. The panel came to the conclusion that the costs of Internet voting are highly variable and depend upon the design features of the model used. These design features include: the auditing and public education components,

the availability of authentication materials (that is, are the authentication documents and procedures tied to a general set of e-government services or are they unique to the voting experience), and other matters specific to each jurisdiction. In short, whereas costs savings may be realized in some implementation approaches, they are not present in all cases.

The panel's conclusions and recommendations

The panel concluded that Internet voting has the potential to provide some benefits for administering local and provincial government elections in BC and that the most significant potential benefit of Internet voting is increased accessibility and convenience for BC voters. However, other presumed benefits, such as increased turnout and lower cost are not typically realized.

The panel also concluded that Internet voting has some significant inherent risks. It is important to understand that although the Internet is used for an increasing number of interactions (such as banking, shopping, dating, planning trips, and the like) with their own risks, voting over the Internet has a set of unique challenges that inevitably introduce a number of additional risks. The extent to which each of these risks can be mitigated or eliminated also depends on how an Internet voting model is implemented. Security at the voter's device, reduced transparency and auditability compared to traditional voting methods, and cost were seen by the panel to be the most significant challenges to implementing Internet voting for either local government or provincial government elections.

While Internet voting has been investigated by various jurisdictions around the world over the past 15 years, it is still not widely implemented. Internet voting is used in only a limited number of jurisdictions, and only on a limited basis. Since the submission of the panel's report to the Legislative Assembly, Norway has announced that it will not continue its trial of Internet voting due to concerns around security and a recognition that it did not lead to increased voter turnout.

Weighing the benefits and challenges to implementing Internet voting in specific circumstances is the role of policy-makers. There is a high level of trust in the current voting processes used at the local and provincial government levels, but there are opportunities for improvement in each. The panel believed that Internet voting has the potential to be an additional voting channel for voters with specific accessibility challenges in future local or

provincial government elections, provided that the recommendations outlined in its report are followed and any system implemented complies with the principles established by the panel. The panel believed it was not feasible for this to occur in time for the 2014 Local Government Elections.

To guide members of the Legislative Assembly, and potentially local government officials, in their task of weighing the benefits and risks of Internet voting, the panel set forth the following recommendations:

1. Do not implement universal Internet voting for either local government or provincial government elections at this time. However if Internet voting is implemented, it should be limited to those with specific accessibility challenges. If Internet voting is implemented on a limited basis, jurisdictions need to recognize that the risks to the accuracy of the voting results remain substantial.
2. Take a province-wide coordinated approach to Internet voting. If Internet voting is to be implemented at either the local government or provincial government level, election administrators should work with each other and with the provincial government to conduct a more rigorous review of the options, establish a common framework for implementation, and retain control and oversight over election administration during implementation.
3. Establish an independent technical committee to evaluate Internet voting systems and support jurisdictions that wish to implement approved systems. Provincial and local government election administrators do not have the necessary technical expertise in-house to properly evaluate, verify and test high security systems such as Internet voting systems. A technical committee independent from vendors, political parties, and elected representatives, reporting to the Chief Electoral Officer and made up of election administrators and recognized experts in Internet voting, cryptography, and computer security should be established to support the province-wide coordinated approach.
4. Evaluate any Internet voting system against the principles established by the panel. While acknowledging that there will be unique factors to consider in each jurisdiction, the panel recognizes the benefit of establishing a common, or at least similar, set of principles that can be used by multiple jurisdictions in Canada to evaluate Internet voting. These principles include: accessibility, ballot anonymity, individual and independent verifiability, non-reliance on the trustworthiness of the voter's device, one vote per voter, only count votes from eligible voters, process validation and transparency, service availability, and voter authentication and authorization. More details about these principles are available in the panel's report.



Paper ballots may be seen as old-fashioned, but the current system of voting in Canada is considered secure, transparent and auditable, and not unreasonably expensive.

Conclusion

BC's Independent Panel on Internet Voting concluded that at present the benefits of Internet voting are very limited and the challenges to successfully implementing Internet voting are many and complex. The panel recommended that any implementation of Internet voting in BC should not be rushed and that a province-wide coordinated approach was the recommended strategy. This approach will ensure that local governments have the support required

when assessing the suitability of Internet voting for their jurisdiction. The panel also recommended an independent technical committee of experts should be recruited to guide the consideration, implementation, and evaluation of any system, and that such a committee evaluate potential systems against the principles identified by the panel. The panel's report and recommendations are before the Legislative Assembly.