

## Submission to the Victorian Electoral Matters Committee Inquiry into Electronic Voting 2016

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This submission was prepared by Dr Chris Culnane in his personal capacity. The opinions expressed in this article are the author's own and do not reflect the view of his employer.

This submission will focus on the dangers of introducing internet voting. It will not cover the technical details of end-to-end verifiable voting in polling places, but the author is both qualified and happy to discuss such matters if required.

Culnane has been a Research Fellow in verifiable voting since 2009, firstly at the University of Surrey, and since May 2016, at the University of Melbourne. From 2012-2015 he was also the Technical Lead for the University of Surrey on the vVote project run by the Victorian Electoral Commission (VEC) to develop an end-to-end Verifiable Election System. The system was deployed as the Electronically Assisted Voting solution for the 2014 State election. Culnane led the design and implementation of the back-end systems and protocols for the project and provided on-site support at the VEC in the run-up to, and throughout, the election period.

### Changing Election Systems

Democracy is the cornerstone of our society, and consequently, the quality of our democracy has a direct impact on the stability of our society. Every member of our society has a duty to both engage in, and safeguard, the democracy underpinning it. For many years our democracy has been served via paper based election systems. Such systems have served us well, whilst not perfect, they have proven to be remarkably robust and reliable. In spite of this, the paper based voting system is increasingly coming under pressure from a voracious drive for modernity. Across Australia, and the wider world, there are pressure groups, advocates, and multi-national corporations pushing for the adoption of internet voting. The motivations behind their position varies, from those seeking convenience through to those in the pursuit of profit. One motivation that is lacking is that of improving democracy. There was a short period, before any internet voting systems were used, when certain groups asserted that internet voting would increase political engagement and turnout, however, that has largely been demonstrated to be false [1] in real world elections. It is also of little relevance to Australia with its compulsory voting laws. When considering a change to an election system there is only one question that should be asked: "what impact will the change have on democracy?" The answer to that one question is more important than all of the other considerations, including convenience, cost, and modernity, all put together.

### What impact would internet voting have on democracy?

Internet voting is fundamentally another form of remote voting, and has many of the disadvantages of postal voting, with the addition of the security problems associated with any online service. There are many technical reasons why internet voting should not be pursued, but above all, there is a democratic reason why remote voting, including internet voting, should not be encouraged or widely provided.

Democracy should be a right that is conferred onto people, it is not something that should require individual assertion. The problem with remote voting, online or postal, is that it undermines the democratic rights of the most vulnerable members of our society. Solving the technical challenges does nothing to protect people from coercion and vote stealing. The advantage of supervised voting in polling places, is that it enforces secrecy on everyone without requiring them to assert their right to it. Remote voting delegates the provision of secrecy to the voter themselves. The carefully constructed protections offered in a polling place no longer exist, it is left to the individual to enforce their own secrecy. Internet voting makes the challenge even harder, requiring the voter to not only secure the environment in which they cast their vote, but also to secure the computer and internet connection they will use for voting. Evidence suggests that users are not capable of securing their devices, and Australia particularly faces serious challenges. A report from Trend Micro showed that Australia ranks 3rd globally in terms of the number of users clicking malicious links [8], equating to 22 million malicious links being clicked in the 4th quarter of 2015 alone [2]. In the face of such a challenging security environment, it is currently inconceivable to believe that the average user has the capability to secure their machine.

The situation becomes even worse for those facing coercion. Coercion is often misinterpreted as being a problem only seen in developing countries with powerful tribal cultures. The reality, is that coercion exists in many forms and increasingly so within our societies. Such coercion can originate from the wider community, but more frequently, it manifests itself closer to home in the form of a spouse. The frightening figures on domestic abuse, in both Australia and across the western world, indicate that often the home is not a safe place to exist, let alone to vote. It is, sadly, all too frequent that people find themselves in controlling and abusive relationships; the assumption that a controlling partner will not exert control over voting is naive in the extreme. Coercion is incredibly difficult to detect and stop, often leading to the misconception that because no coercion or fraud has been detected, it does not exist [3]. The very fact that someone is being coerced, or controlled, prevents them from reporting it. Not only that, but someone facing such a situation has far bigger concerns than the sanctity of their vote. Can we really expect people in such a situation to report voting coercion?

It is also not sufficient to provide supervised voting as well as remote voting, because anyone under coercion would be forced to vote using the more vulnerable remote system.

Whilst the arguments for improved convenience are clear, one of the keystones of society is that we collectively protect everyone, including those less fortunate than ourselves, and those in a minority, even if it is inconvenient for the majority. The idea that as a society we should sell out the most vulnerable, in the pursuit of convenience for those of us fortunate enough to be able exercise our freedoms, is nothing short of abhorrent.

## Partial Introduction of Internet Voting

It is not uncommon to see the suggestion that internet voting should be selectively introduced to particular groups, for example, disabled voters. Such a suggestion seems rather impertinent. It indicates that an insecure voting system is acceptable for use by disabled voters, but not by everyone else. Conversely, if the system is claimed to be equally strong to paper voting, there is no justification for excluding able-bodied voters. If the system is made universally available the problem of coercion just becomes bigger.

History shows us that restrictions on access to a voting service are gradually eroded. The original legislation on Postal Voting in Victoria (1910) had very specific restrictions on who could apply. Voters had to reside a minimum of 5 miles (3 miles if in a mountainous region) from a polling place, or at least 5 miles away from a polling place throughout polling day, or due to ill-health or infirmity would be prevented from attending a polling place. If we examine the legislation today, it now merely states that a voter "...will be unable to attend an election

day voting centre during the hours of voting on election day". The subtle change may not seem important, but in fact it is, it goes from a quantifiable evaluation of distance or medical condition, to a subjective one of ability.

There is no reason to believe the same would not happen with internet voting if it were introduced. Whilst it may initially be introduced for a select group, pressure would soon rise to open it up to wider access. It is this gradual creep in scope that is most dangerous.

## What should be done?

No system is perfect and there is always room for improvement. If convenience is really of concern, the use of Early Voting could be expanded. The argument against it is often from political parties suggesting it reduces the effectiveness of their campaign, with votes being cast before the campaign is completed. That argument holds no water if remote voting is being considered, since the same issue would arise. The universal use of an end-to-end verifiable electronic voting system in the polling station would aid in both accessibility and formality rates, without impacting on secrecy or the security of the vote. The end-to-end verifiability would in fact be an improvement over the existing paper approach. It would greatly speed up the counting process and significantly reduce the workload.

Remote voting, including postal voting, should be further restricted. The perpetual increase in postal voting is deeply concerning. The UK is a perfect example of the problems that arise with an increase in remote voting [5] [7]. In his UK High Court judgement [6], The Election Commissioner Richard Mawrey QC wrote "The ease of postal vote fraud and the difficulty of policing it led to such a great upsurge in personation that, in the Birmingham Case, the number of false votes was virtually half of all votes recorded as having been cast for the winning candidates."

In Victoria, there is a creeping acceptance of widespread postal voting, with numbers in 2010 just shy of 250,000 [4], and further increases seen in 2014. The current postal voting application form does not even require the applicant to justify their application for a postal vote. This is indicative of lax enforcement of the postal voting restrictions. Some form of remote voting will always be required, for example, to enable house-bound voters to cast their vote. However, it should be strictly limited to those who would otherwise be disenfranchised.

## Scrutiny of Elections

The paper election system already includes software components, most notably the counting software. Any system currently in use, or introduced in the future, must be open to the same high level of scrutiny as the manual equivalent. Victoria currently achieves this, with its electronic counting code publicly available [10], and its electronically assisted voting software from 2014 entirely open source [9]. That achievement should not be undermined in the future, it is vital that source code for all components used in the election are made open source. As an assertion that is stronger than merely providing the source code for review. Whilst making source code available for review is better than nothing, it is not the ideal solution. Elections are publicly funded events and as such the software that is used for them should be publicly owned. Electoral Commissions should not find themselves beholden to a private enterprise for software licenses. The criticality and long lead time associated with election systems results in a weakened negotiating position for the Electoral Commission, leading to a risk of being overcharged.

More crucially, the engagement of external corporations to develop and run election systems leads to a critical skills shortage within the Electoral Commission itself. Any pursuit of electronic voting in polling places should be coupled with the creation of an expert team within the Electoral Commission. In the same way that the Electoral Commission currently employs experts in

delivering and planning paper based elections, it needs to build up an equivalent knowledge base on electronic voting and counting. To not do so leads to a tacit privatisation of elections. If the Electoral Commission does not have the capability, and legal right, to understand, publish, support, and deploy, all of the software components it uses, it by definition, does not have full control over them. More worryingly, electronic elections are increasingly being run as a service, creating a metaphorical black box that collects votes and outputs a result. The equivalent would never be tolerated in a paper election, imagine the reaction if an Electoral Commission announced it was privatising its vote counting by delivering the ballot boxes to a privately run factory, which would count them and return a result? Such a situation would not be tolerated, and it should not be tolerated in the electronic setting either.

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