VICTORIAN ELECTORAL COMMISSION

SUBMISSION TO THE ELECTORAL MATTERS COMMITTEE (EMC) INQUIRY INTO ELECTRONIC VOTING

Introduction

The Electoral Matter's Committee (EMC) Inquiry into Electronic Voting comes at a crucial time in positioning the State's electoral system for the future.

At electoral events undertaken by the Victorian Electoral Commission (VEC), the question of voting over the internet continually arises. This is a logical reaction by electors fully connected in every aspect of their life and increasingly dependent on the internet for their affairs and the delivery of government information and services. Their experiences bring the expectation that online voting should be as accessible and as simple as online banking.

In 2006, the VEC conducted a successful trial of Electronically Assisted Voting (EAV) for electors who were blind or had low vision. This involved the establishment of electronic voting kiosks at designated electronic voting centres where eligible electors could attend to use the EAV service. For the 2010 State election, the category of electors able to access EAV was expanded to include electors with motor skill impairments, insufficient language or literacy skills and those located outside Victoria attending a designated electronic voting centre. EAV was provided again at the 2014 State election in a modified form, but at a reduced number of voting locations.

At each of these elections EAV was provided only during the two week early voting period and at supervised voting centres. The provision of EAV via a kiosk facility has not been provided on election day due to the technical complexity in set up and support for a single day in venues not owned by the VEC, and the consequent impact on voting centre operation and efficiency. These limitations in EAV, particularly the requirement to attend a supervised voting centre, have contributed to the very low elector take up rates evident over the last three State elections. This has been confirmed in feedback to the VEC from target user groups.

The EMC's 2014 Inquiry into the Future of Victoria's Electoral Administration discussed electronic voting as part of a broad examination of Victoria's electoral architecture, administration and practices. In that inquiry the EMC acknowledged the potential of remote electronic voting, but was averse to the VEC pursuing such a solution given the risks identified at that time were considered to outweigh the positive returns remote electronic voting might deliver.

In its *Report to Parliament on the 2014 Victorian State Election*, the VEC recommended an amendment to legislation to enable a limited category of electors (blind or with low vision, motor impaired, insufficient language or literacy skills, interstate and overseas) be allowed access to a remote voting system where their vote could be cast and transferred electronically without the need to attend a voting centre. The EMC response was to defer discussion to this current inquiry.

Given the focus of this inquiry, it will be very easy for debate and argument to centre on the technology associated with electronic voting and not the policy considerations around its use and fit within an established and functioning electoral system. While the VEC recommendation in its 2014 State election report supports the introduction of a remote electronic voting solution, it takes into account the VEC experience with EAV over three State elections, the changing social and technical environment within which State elections are conducted, and the totality of the State's electoral system through which services to electors are provided.

Importantly, it is necessary to consider how these services will be provided in the future. The development of a viable long term strategy around the introduction of remote electronic voting (for a limited category of electors) will identify any resulting challenges and benefits, further develop the capability of electoral administrators in this area and prepare the State for what many observers regard as an inevitable transition. The ability to deliver traditional paper-based voting options via postal services cannot be guaranteed into the future.

What is meant by Electronic Voting?

Electronic voting "…describes a broad range of practices involved in the casting or counting of a vote that involve the use of (electronic) technology"[1]. There are many kinds of electronic voting, ranging from systems where the vote is collected and counted electronically to systems where the computer simply marks a ballot paper on the voter's behalf. Some electronic voting systems can be completely online, whereas others may be provided at a nominated location or require specific hardware or software[2].

Legislation in Victoria limits the provision of electronic voting to supervised voting centres where eligible electors cast their vote. At the close of voting, votes are extracted from the electronic ballot box and printed for subsequent inclusion into the election results. Supervised voting in this form has the advantage that it meets most, if not all, of the usual standards for electoral integrity as paper-based voting systems[3].

Alternatively, and of most interest to the VEC, is remote electronic voting, where electors can vote unsupervised on a computer, which then submits their vote to a centralised system via the internet. Using the internet in this way does raise additional challenges, yet at the same time provides distinct advantages to electors while enhancing certain administrative processes.

In considering the benefits and challenges associated with electronic voting, the VEC will consider only kiosk (supervised) voting and remote (unsupervised) electronic voting in this submission.

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[1] *Electoral Reform Green Paper, Strengthening Australia's Democracy*, September 2009, Commonwealth of Australia, pg.169.

[2] *Inquiry into the future of Victoria's electoral administration*, Discussion Paper, Electoral Matters Committee, November 2012, pg. 31.
[3] opcit

Benefits

As a primary benefit, electronic voting provides a facility for electors who are blind or have low vision, motor skill impairments or language barriers to independently cast a secret vote. At Victorian State elections, this capability has only been available in person at a VEC kiosk in designated electronic voting locations.

In controlling the hardware used by an elector, the VEC can manage the associated software and transmit the votes to its servers over its own private networks. Security protocols are managed to ensure the system meets a number of essential requirements, and the system can detect and report on any possible malicious or unauthorised attempts at access. The VEC uses a universal verification protocol that aims to provide guarantees of accuracy of the count and ballot privacy independent of software and hardware. Assurance of the accuracy relies on providing transparency of the process whilst maintaining ballot privacy. Voters can confirm that their vote is accurately included in the count, whilst avoiding dangers of coercion or vote buying.

While these attributes are currently inherent in the VEC's supervised vVote facility, similar security and verification protocols can also be provided in remote electronic voting systems.

Making EAV facilities available to electors remotely, e.g. in their own homes, provides a more accessible voting option for those electors already experiencing difficult personal circumstances and for whom getting to a voting centre is in itself an obstacle to voting.

A remote electronic voting solution also removes the financial and technical overhead in rolling out and supporting the operation of voting kiosks in designated locations. This is a particular consideration when establishing electronic voting facilities at interstate and overseas venues.

For electors travelling interstate or overseas during the election period, the VEC establishes a number of early voting centres; however these centres are limited in number and the onus is on electors being able to get to them, which is not practical if they are in remote areas. Similarly, as access to postal services in remote areas is extremely limited, electors can be disenfranchised. The number of votes taken at these centres is consistently small given that previous VEC research indicates that as many as 90,000 eligible electors can be overseas during the month of November. A remote electronic voting solution would provide access to voting for electors travelling interstate or overseas within hours of the close of nominations.

Where offices have been established in interstate and overseas locations (often reluctantly by the hosting agency), the urgent physical transfer of ballot material is reliant upon postal and courier services, which are proving less responsive. This fact was acknowledged by Australia Post before the Joint Standing Committee on Electoral Matters in 2014.[4] An electronic voting solution can entirely negate the need to courier time-critical ballot material over long distances.

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[4] *Second Interim Report on the Inquiry into the Conduct of the 2013 Federal Election*, JSCEM, Canberra, November 2014, pg. 50.

A further benefit of an electronic voting system is the elimination of unintentional informal voting, as the system can be designed to alert electors that they are about to cast an informal vote, and provide them with the opportunity to correct their vote before submitting it. The reduction in informality rates was apparent at the 2014 State election where the informality rate was 2.6% for votes taken electronically compared with an average informality rate of 5.22% for non-electronic votes.

In Victoria currently, ballot papers completed electronically must be printed for inclusion in the count. At the 2014 State election the 1,121 electronic votes were printed centrally, reconciled and dispatched to the relevant district election office after election day. This meant that although electronic votes were available from close of voting, they were not counted until at least three days later. The implementation of electronic voting on a broader scale, along with the ability to directly transfer preference information to count systems, would provide another benefit in the form of faster reporting of voting statistics to the media and public.

Challenges

Electronic voting does present a number of challenges.

The introduction of technology into the voting process, be it an electronic electoral roll or a voting kiosk, also introduces the risk of hardware or system failure.

In addition, some electors may be reluctant to trust their vote to the security of a computer, preferring the tangible evidence provided by a paper ballot inserted into a sealed ballot box. This paper ballot is then subjected to extensive manual handling during reconciliation and counting and must at all times be available to scrutineers. An electronic ballot can be difficult to audit and currently requires complex verification mechanisms to provide confidence that the vote counted was the same as the vote cast.

Remote electronic voting using the internet introduces additional considerations around security and proof of integrity. Internet voting systems are more exposed to some forms of attack than kiosk style services that do not require use of the internet.

Under an internet voting system, administrators have no control over the elector's voting equipment or network. This has the potential to compromise elector privacy where the elector's machine may be watched by a third party. Further, reliance on the public network also means electoral administrators cannot guarantee service availability at all times.

A further challenge often raised in regard to internet voting is ensuring the identification of the person voting – are they who they say they are? However, options for elector authentication are available and are at least as strong as those that exist under current postal voting arrangements. It should be noted that electors are not asked to provide identification at voting centres.

The secrecy of voting can never be strictly enforced under an internet-based voting system. In fact, this is the case for any system that allows people to vote away from the controlled, impartial environment of a voting centre, including the current postal voting system. An elector completing a postal vote is not under the supervision of an election official and, if the elector chooses to do so, they can show someone how

they voted. Further, their ballot material must travel between the elector and the election official via a third party such as Australia Post and may be handled by many unknown parties before reaching its destination.

The idea that an elector can be coerced into voting in a particular way presents as a challenge with remote electronic voting, where the elector is operating away from a supervised voting environment. The same circumstance potentially exists with postal voting, although this has not been evident under the current postal voting system in Australia. As a protection against coercion, electronic voting can be facilitated in a way that allows the elector to change their vote up until the close of voting.

The use of supervised electronic voting kiosks at designated voting centres can also present challenges in terms of voter flow. Completion of an electronic vote, particularly in the Victorian electoral context, takes the elector a longer time than completing their paper ballot papers in the traditional manner. This factor would need to be considered if options to expand the electronic voting franchise in the future were considered.

Remote electronic voting using the internet provides particular benefits, yet presents particular challenges. The challenges are real but not insurmountable and, with caution and due consideration of risk, many benefits can be realised.

The Victorian Experience

The VEC is responsible for the conduct of fair, efficient and impartial elections in accordance with the law. The *Electoral Act 2002*, principally, prescribes elector enrolment arrangements and the conduct of Parliamentary elections, while also requiring the VEC to undertake electoral education and research, elections under the *Local Government Act 1989* and to support the Electoral Boundaries Commission.

Within the constraints of legislation, the VEC has been innovative in its administration of Parliamentary elections. This has included direct enrolment, the use of electronic certified lists (or voters rolls), enrolment and voting on election day, electronic counting for the Upper House, and commencing in 2006, electronically assisted voting. In addition, the VEC has been a forerunner in the development of computerised election management systems to support the administration of large scale electoral events.

Innovation has occurred within the bounds of key principles. These principles, as listed in the *Electoral Reform Green Paper, Strengthening Australia's Democracy* include representation, responsiveness, universality, neutrality, transparency in electoral administration, integrity, rule of law, civic culture, freedom of political expression and effectiveness and efficiency of electoral processes. The principles are upheld at each election and in operation, provide electors with real evidence as to the standards around the electoral process and its integrity. That said, the principles can at times come into conflict; for example, producing a quick election result could impact accuracy and integrity.

The Green Paper also talks of flexibility where "…there should be mechanisms in place to enable prompt adjustments to be made to the processes and procedures to reflect changes in societal expectations and to take advantage of opportunities

arising from technological change."[5] The VEC has for many years sought to be flexible and responsive in meeting societal expectations.

The VEC has conducted three electronic voting projects. Each project delivered a kiosk-based voting solution within an established early voting centre. At the same time, each project was different both in the technology used and the breadth of the deployment.

At the 2006 State election, Hewlett Packard was engaged under contract as the project manager to deliver the EAV system, including the supply of hardware and the deployment of the voting kiosks. The Spanish company SCTYL was subcontracted to supply and configure its electronic voting software for the Victorian environment. The voting kiosks were made available at six early voting centres in Victoria with instructions for system use provided in English only. As electors voted, the preferences were stored in the voting kiosks in encrypted files for subsequent printing, sorting and distribution to counting centres for inclusion with other paper ballots. This trial was a success; the technology was proven to be reliable, accurate and secure.

At the 2010 State election, new legislation enabled the expansion of EAV to include not only electors who are blind or who have low vision, but also those with low English proficiency/literacy and electors with a motor skill impairment. This time the VEC directly contracted SCYTL to enhance the software previously provided, taking into account the additional requirement to enable telephone voting at each Victorian early voting centre where voting kiosks were deployed. The enhanced system provided recorded instructions in 12 languages to guide electors through the voting process.

The EAV voting kiosks were installed at 101 early voting centres in Victoria, eight interstate early voting centres and three centres in the United Kingdom. As in 2006, all votes cast were printed and included in paper form for counting. Despite its relatively low take-up within Victoria, EAV in this form was considered by users to be an overwhelming success. In its report on the conduct of the 2010 State election, the then Electoral Matters Committee supported an electronic voting trial for the 2012 local government elections - provided that the VEC ensured that the voter was able to access a voter-verifiable record of their vote prior to it being lodged. However, local government legislation did not support the use of electronic voting for the 2012 council elections.

At the 2014 State election, EAV was again provided during the early voting period and was available to eligible electors within 24 locations in Victoria and to Victorian electors in London. The VEC deployed a completely new voting system (vVote), created in-house by local and overseas expert developers. The vVote software provided voters with the ability to verify that their vote had been recorded and counted as cast, while still protecting the secrecy of their ballot. This system was the first of its kind to provide end-to-end independently verifiable EAV and fully open source software. Additionally, the software provided a range of functions specific to eligible electors including information in 20 languages. As electors cast their votes, they were transmitted to the VEC for subsequent decryption and printing on election

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[5] *Electoral Reform Green Paper, Strengthening Australia's Democracy*, Commonwealth of Australia, September 2009, pg.22.

night and inclusion in counting with other paper ballots. Surveys of users of vVote indicated that this trial was a success.

The table below provides a snapshot of each of these projects.

Year	Product\Supplier	Votes Taken	
		Victoria	**Overseas**
2006	HP subcontracted to SCYTL	199	0
2010	SCYTL	258	703
2014	vVote (internal VEC application)	148	973
Totals		**605**	**1,676**

Lessons learned from VEC Electronically Assisted Voting projects

As stated, the VEC has conducted three electronic voting projects and common threads have emerged across all three.

Firstly, kiosk-based electronic voting can be implemented successfully for Victorian State elections. The experience from 2006 and 2010 proved the concept. At the 2014 State election, the idea of end-to-end verifiability was also proven in the vVote application.

Yet kiosk voting, as evidenced in the table above, has resulted in low numbers of votes. Irrespective of the VEC's efforts over the three State elections, the number of target voters using electronically assisted voting remains very low. There has been no interest among voters who are not fluent in English, and only a small minority of blind and low-vision voters used the system despite increased promotion. The only group of voters showing interest in greater numbers are those voting overseas, who are not part of the target cohort.

Evidence suggests that for the target cohort, many of whom find travel difficult, getting to the early voting centre is a significant inhibitor to using the products on offer. Indeed, feedback from the VEC's disability advocates is that, though appreciative of the VEC's efforts in providing an electronically assisted voting service, they believe that true uptake of electronic voting for this group of eligible electors will only be realised if they can vote from home or another familiar environment.

These projects have also highlighted the fact that electronic voting software and systems are complex and expensive, and are the most difficult technology projects undertaken by an election management body. The VEC, along with other electoral commissions, is reliant on a very small Australian pool of technology specialists who truly understand what is required to deliver such projects. Retaining this talent within a commission between electoral events is not a sustainable way of ensuring the successful delivery of electronic voting projects. This poses an enormous risk, especially given the complexity of the technology and its infrequent use over a four year election cycle. Any long term future for electronic voting needs to address this issue in order to be sustainable.

Given the four-year gap between State elections, the electronic voting software and hardware used at one election is almost certainly obsolete by the next election. This necessitates a large re-investment in technology at each event, and this investment is returning negligible benefit to either the target voter cohort or the VEC in terms of business efficiencies.

At early voting centres, the impact of providing kiosk-based electronic voting facilities (in addition to standard voting services) has been out of proportion to the votes taken. Deploying and supporting the kiosks, which requires specialist business and technical knowledge, has added additional overheads and risk to a business environment already managing critical processes and high volumes within short timeframes.

The VEC experience with EAV, culminating in vVote at the 2014 State election, has been valuable in proving the concepts around kiosk-style electronic voting and end-to-end verifiability in confirming system (vVote) performance. Yet the highly secure nature of vVote, its restriction in operation to designated electronic voting centres, complexity in setup and the manner in which the verification process is presented to electors, have contributed to its low patronage. An internet voting option would be transformational in the provision of voting services to those electors challenged by the requirement to attend a voting centre. It is evident from experience that kiosk voting in the various forms used by the VEC will not enjoy expanding participation by the current franchise within Victoria. This situation was acknowledged by the Acting Auditor General in his report into the performance of the VEC at the 2014 State election where "…the VEC will need to determine whether to further refine vVote, provide an alternative EAV system or abandon EAV all together".

The VEC is clearly committed to providing equal access to democracy for all Victorians and the target cohort have for too long, been unable to access the same voting experience as others. The primary objective of the three EAV projects has always been to provide a voting service for the target cohort that enables these electors to vote independently. The VEC will continue to provide facilities, in some form at future elections, to enable all electors the choice to complete their vote independently.

Other Jurisdictions

Electronic voting has been trialled or implemented in a number of jurisdictions in Australia.

Elections ACT has provided kiosk-style voting since 2001 at four elections where the voter, having had their name marked off the roll, uses a barcode to authenticate their vote. Voting terminals are linked to a server in each polling location using a secure local area network. No votes are taken or transmitted over the internet. In polling places that do not have electronic voting, voters still use traditional paper ballots, which are subsequently scanned. In electronic polling places, voters are given a choice of voting electronically or on paper. Votes taken electronically are imported into an electronic counting system along with data from the scanned paper ballots. Provisional results from electronically captured votes are available shortly after the close of voting on election night. In the 2012 ACT election, electronic voting was provided at the six pre-poll centres and at the same locations on election day. A total of 59,200 electronic votes were cast, representing 25.8% of all voters.

In the 2007 Tasmanian Legislative Council elections a computer-based system was provided for electors who were blind or had low vision. Audio guidance and a telephone-style keypad assisted the elector to cast their vote, which was printed by the elector at the voting kiosk and deposited in an adjacent ballot box. The service was provided at one location in Hobart, and two electors voted or attempted to vote electronically.

A similar arrangement was provided for blind and low vision electors in Western Australia in 2013. However, there is legislation now before the Western Australian Parliament to provide for a form of remote electronic voting at their next State election in March 2017.

In 2007, the Australian Electoral Commission (AEC) implemented a trial of electronic voting in the form of kiosk voting for blind and low vision electors in 30 pre-poll voting sites, and remote electronic voting for some Australian Defence Force personnel. The AEC's kiosk system facilitated the vote only and did not store any vote data; the encoded vote was printed and placed in a ballot box. Later the vote was decoded and included in the count. The remote electronic voting trial for Defence personnel used a secure Defence network, with ballots printed subsequently and included in the count. There were 850 kiosk votes, and 1,157 votes by ADF personnel. The Joint Standing Committee on Electoral Matters recommended that the trial be discontinued. For the 2016 Federal election, a telephone call centre has operated for electors who are blind or have low vision.

In 2011 in New South Wales (NSW), a remote telephone and internet voting system (iVote) was provided. Initially for voters who were blind or had low vision, disabled or living more than 20 km from a voting centre on election day, eligibility was later expanded to include any voter not within the State on election day. At the 2011 State election, some 47,000 electors cast their vote electronically, after having registered to use the iVote service. The iVote system was provided subsequently at by-elections in 2013 and 2014. More than 283,000 eligible electors cast their vote electronically over the internet on the iVote system at the 2015 NSW State election. On decryption, these votes were included directly into results reporting. The benefits in providing remote electronic voting in NSW included reaching far more of their eligible electors, while removing the need to establish interstate and overseas voting centres.

As can be seen, there has been no consistent development of electronic voting across Australian jurisdictions to this point. Harmonisation has been elusive. While advances have been made in providing kiosk-style facilities principally to blind and low vision electors, only NSW has provided a remote electronic voting option available to the disability sector more widely, and its success in reaching out to this group, in comparison to Victoria is evident in the strength of its take-up. In capitalising on the NSW success, it is understood that the Western Australian transition into remote electronic voting will model the service provided in NSW. If this is the case and remote electronic voting in Victoria is supported in a similar form, consistent development and harmonisation in this technical election service area may well be achievable.

International Experiences

The examples of electronic voting overseas are extensive, as many countries have used remote internet voting for binding political elections. In Estonia, internet voting

is at the heart of their e-government strategy and has been offered as a voting option since 2005. Over 30% of ballots were cast through the internet in its 2015 election. In France, internet voting is provided to French citizens living abroad (55% of expatriates voted online in the 2012 elections), and in Switzerland, internet voting is available to expatriates for all elections and referendums. In Canada, the provinces of Ontario and Nova Scotia allow internet voting in municipal elections, and in 2014 about one quarter of Ontario voters cast their vote online.

Norway is a particularly interesting case - having used internet voting firstly at a municipal level and then at a national election, internet voting was abandoned. A first trial took place during Norwegian local government elections in ten municipalities in September 2011. Following this success the Government decided to conduct another internet voting trial during parliamentary elections in 2013, with a narrow majority of parliament approving use.

Twelve municipalities were involved in this second electronic voting trial. Although the trials of 2011 and 2013 were positively reported upon and with no significant security concerns appearing, the topic remained politically controversial. In the ensuing discussions, fears about transmitting the vote over the internet and the risk to the sanctity of the vote cast outside the polling station - coupled with the lack of broad political support - led to a Government decision to discontinue further electronic voting pilots in Norway.

Current Environment in Victoria

The environment in which the VEC delivers election services is rapidly changing. Technology pervades our lives. Access to information is effortless and the type of information available is expanding exponentially. Our daily business is conducted remotely with a tap and a swipe at a time of our choosing and from any location.

Access to government services is similarly affected, with information and data continuously available often through a single portal and with online transactions replacing face-to-face engagement. Further, the idea and practice of connected government is strengthening with the expectation that a single transaction with one government agency will meet a multitude of agency reporting requirements, or will automatically stimulate a government action on behalf of the individual. Intentions in this area are evidenced for example in the Victorian Government's recently announced Information Technology Strategy 2016-2020.

For the individual, typically the expectation is one of "easier and quicker", particularly as the ability to understand and maximise technology expands. This is not limited to the younger age group, with many others now very mobile and connected and seeking convenience in their lifestyles. This being the case, it is also reasonable to say that people who are blind or have low vision, those with motor skill impairments or language and literacy difficulties have benefited from assistive technology advances such as smartphone and tablet applications and screen readers. An expanding "new media" along with digital substitution in the print industry reflect changing information and communication requirements and a shift in expectations.

Importantly, while there is a high level of trust in the performance of systems and applications (for example, in banking), unexpected outages or disruptions to our ability to continuously communicate and transact are not tolerated.

While election day still retains primacy with respect to voting, this too is changing. Over many years, as parliaments have sought to ensure the franchise, the arrangements by which electors are able to vote have increased. Aside from ordinary voting on election day, electors can vote early either in person or by post. Electors outside their district on election day can cast an absent vote. Electors travelling overseas or interstate can attend established early voting centres or in some specific circumstances receive their ballot material by email with instructions for its return by mail. Certain electors can nominate to receive their ballot material automatically as an election is announced. Mobile voting is provided to special institutions including prisons. Antarctic electors are catered for and there is also provision for enrolment and voting on election day subject to certain provisions. The VEC's vVote system provides a voting facility for electors who are blind or have low vision, those with language or literacy issues and those with motor skill impairments.

Even with these arrangements, electors expect to be able to vote at a time of their choosing. This is evidenced in the take up of early voting in Victoria, where in the 2014 State election 34.11% of the total vote was taken prior to election day. In the South-West Coast District by-election in October 2015, this figure was 54.67%. From the elector's perspective, the expectation is that voting centres will be widely available, centrally positioned, fully wheelchair accessible and any waiting times will be minimal. Service is to be immediate. Thereafter, vote counting and results reporting should be expeditious, error-free and provide a final outcome on election night.

Yet within this information-rich environment, engaging and educating electors in their democracy is proving challenging. Despite direct enrolment action, an anticipated 210,000 eligible Victorian electors are not enrolled for the 2016 Federal election. At the 2014 State election, turnout was encouraging at a steady 93%, yet there is evidence of declining voter interest nationally. Worryingly, the percentage of ballot papers deemed informal in Victorian State elections has doubled since 1996.

Every four years, local government elections are held in Victoria involving up to 79 councils. For the elections in October 2016, the VEC will conduct elections for 78 councils. Of these, 72 councils have determined that their elections will be conducted by post. Within this complex State-wide election programme involving around 2,000 candidates and 259 separate elections, about 4 million postal voting packs will be delivered and returned in a three-week voting window - at a substantial and increasing cost and with high risk in a declining delivery environment. This situation is acknowledged in the recent discussion paper "Act for the Future – Directions for a New Local Government Act", where it is stated that uniform postal voting systems would also support a transition to electronic voting should it become technically viable to do so, while preserving the integrity of the election.[6]

In summary, electors have particular demands around involvement and engagement in the voting process. Relevant information should be continuously available and all necessary services provided online. The act of voting should be quick and conducted at a time and location of their choosing without restrictions. Results should be available without delay.

Within this setting, there is a role now for remote electronic voting as part of the operational offering to the electors of Victoria.

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[6] Discussion paper *"Act for the future – Directions for a New Local Government Act"*, pg. 58.

The Argument for Change

In the decade that the VEC has offered electronic voting to electors, the setting which the service has been provided has changed considerably.

Yet despite these progressive changes, other elements of the service offering to electors have not proven optimal. In Victoria, the kiosk-based voting system requiring the target group to attend an early voting location is not delivering a wide and worthwhile service to the disabled sector. This cohort of voters have difficulties simply attending a voting centre and those who are able to make the effort are confronted with hardware and software that is unfamiliar and cumbersome to use - making their voting experience unnecessarily difficult and lengthy. This is evident in the poor take-up over the three State elections the VEC has provided electronic voting. Further, interstate and overseas electors remain similarly disadvantaged; voting centre numbers are limited, require the elector's attendance to cast a vote and then rely on courier arrangements for the safe and timely return of ballot material. Electors in regional Victoria are also experiencing declining and slower postal services and are at increasing risk of being disenfranchised should they choose to vote by post.

The contrast is that while EAV in Victoria has not seen any real growth in voter take-up over the past decade, NSW's iVote system has not just delivered an internet voting service, but has fundamentally changed the way disabled and remote electors and their votes are administered in only four years. A similar remote voting system in Victoria could prove equally transformational.

It is acknowledged that the VEC has shifted its position in relation to the use of remote electronic voting solutions as further developments with this form of voting have progressed. In its response to the EMC's 2012 discussion paper as part of the "Inquiry into the Future of Victoria's Electoral Administration" the VEC stated:

> *"Within the current Victorian context, the VEC considers that the risks associated with internet voting options are too high at this point in time. However, the VEC will continue work in this area and follow relevant research so that an efficient and accessible option can be offered in the future for electors in remote locations or who experience difficulties accessing appointed voting locations".*

The VEC is now of the view that an efficient and accessible remote electronic voting option exists in the form of the NSW iVote system. A similarly functioning option should be available to a limited category of electors for the 2018 Victorian State election as recommended in the VEC's Report to Parliament on the 2014 State election.

Further, while the risks associated with internet voting still exist, it is offered that the NSW iVote system, deployed in two binding State elections and six by-elections, has proven the concept of remote electronic voting, successfully balancing security, integrity, effectiveness and efficiency with technological risk.

NSW iVote – the System in Operation

The NSW iVote system is a form of voting where eligible voters can vote using the internet or telephone as an alternative to voting at a voting centre. The enabling legislation was passed by the NSW Parliament in 2010 and:

- defines the eligibility criteria for voters, specifically as those who are blind or with low vision, those who have a disability, those who live more than 20 kilometres from a voting centre, or those who will not be in NSW throughout polling day

- allows the Electoral Commissioner to adopt processes appropriate to the current state of technology

- requires an independent auditor to report to the Electoral Commissioner before voting starts and after the election and

- provides penalties for tampering with the system, disclosing voter preferences or unauthorised disclosure of source code.

Under this legislation, the NSW Electoral Commission (NSWEC) developed its iVote system. It was first used at the State Parliamentary election in March 2011 with 46,864 votes taken, and subsequently used at six by-elections with growth in usage. Most recently, iVote was used at the 2015 NSW State election where 283,669 votes were taken from categories of electors identified in the table below.

Criteria	Total no. of iVotes Taken	% of Total	Internet\Call Centre iVotes	Telephone iVotes
Blind\low Vision	4,818	2%	4,609	209
Other Disabilities	12,714	4%	12,337	377
20kms from Voting Centre	8,407	3%	8,270	137
Outside NSW on Polling Day	257,730	91%	255,357	2,373
Total	**283,669**	**100%**	**280,573**	**3,096**

Source: NSW Electoral Commission

The iVote system is made up of four main components as illustrated in the diagram below.

Source: NSW Electoral Commission

First the elector needs to register as an eligible iVote voter. This can be done either online or via a call centre. The voter is required to provide a PIN of their choice and later receives an iVote number through a channel different from that of registration, e.g. SMS, e-mail or by the normal postal service. The iVote number and the voter's PIN together constitute the voter's secret credentials, and will later be used to log into the iVote system to cast a vote.

Next the elector votes by logging into the iVote system using either an internet connected device such as a computer, laptop, tablet or smartphone, or alternatively using a normal phone in the same way a telephone is used to make a payment or undertake telephone banking. When a vote is cast, it is encrypted and lodged in the electronic ballot box. The voter is provided with an iVote generated receipt number, which can be used to verify the vote at a later stage. The system also records the vote cast in a separate verification server.

Optionally, at any time until the election closes, the voter can check that their voting intent has been correctly registered by the system by calling the verification service.

This service requests the voter's iVote number and PIN, as well as the receipt number obtained after casting a vote. The vote is then read aloud to the voter by a text-to-speech server.

Once voting has closed, the electronic votes are decrypted and the preferences can then be included in the count. The decryption "ceremony" has a number of key steps, all of which can be observed by scrutineers. Firstly, votes where a pre-poll or postal vote has already been accepted are excluded. Then the "electronic ballot box" can be unlocked by a quorum of members of the Election Board (established as an oversight body). The encrypted votes are then mixed and decrypted. An additional verification process is conducted by an independent team, where the votes are re-encrypted and compared to votes held in the independent verification server. In addition, voters can use their receipt number to check on the NSWEC website that their vote entered the count, starting on the Monday after election day.

Once the votes have been extracted and verified, the decrypted votes are input into the NSWEC electronic counting system. It should be noted that the NSWEC electronically count all votes, including votes cast on paper, for both houses of State Parliament.

NSW iVote – An Option for Victoria

The NSWEC has established a working remote electronic voting application, which has been developed and built in discrete components. These components can be used by the VEC, or any other Australian electoral commission, with changes required only to the core voting system. Of the four components identified in the diagram above, three of them (registration, verification and decryption) were developed by NSWEC and could be used by the VEC with few, if any, changes required. The core voting system has been developed under contract to NSWEC by the Spanish company SCYTL. The core system would have to be enhanced to accommodate the different Victorian voting requirements, primarily the formality rules and the structure of the Upper House.

For the VEC, along with all electoral commissions, the implementation of electronic voting systems is costly and complex. If Victoria was to proceed with remote electronic voting, then the only logical option is to partner with NSWEC and invest in the iVote product. There are key benefits to this approach:

- the VEC would not have the financial burden of having to make the initial investment in a remote voting solution, which is a costly undertaking

- continual investment can be made into the iVote product, improving every aspect of the system, rather than fragmenting the investment as each jurisdiction develops its own system - with the aim of each electoral commission delivering the same outcome

- potentially as more jurisdictions join the partnership, a viable Australian competency in electronic voting can be established and grown, removing from each electoral commission the risk of sourcing such expertise each time an election is held and

- by aggregating demand, greater economies of scale can be brought to bear in contract negotiations, which would likely allow a reduction in the running costs of a remote electronic voting election.

Conclusion

The VEC's vision is "All Victorians actively participating in their democracy". The VEC recognises that many Victorians face barriers to full participation, whether by reason of disability, or language, or location. The purpose of changes to the legislation in 2006 providing for electronic voting was to allow for independent voting by electors who otherwise could only vote with assistance.

The Victorian experience over three State elections has proven that kiosk-based voting is not a sustainable method of reaching the target cohort. The very conditions of disability that created the need for electronic voting have also prevented many of these electors from reaching voting centres that provide an electronic option. The only effective method of improving access for this group is to provide a remote voting solution that can be used on a device with which they are familiar and able to use effectively.

The VEC must improve the process of providing voting services for electors who are travelling interstate or overseas. The effort needed to establish fixed voting facilities and transport arrangements for interstate and overseas locations is often out of proportion to the number of votes returned. In addition there is a significant risk that returned ballot material will not reach the VEC within the nine day acceptance period.

Many interstate and overseas electors find the locations inaccessible, and are unable to cast a vote. A remote electronic voting solution will not only allow broader and faster access to the vote for these electors, but will also transform the VEC's delivery of these services.

Victoria's kiosk system vVote is complex to set up and operate, comes with hardware and support overheads, is not suited to election-day activities, and can be difficult for the elector to navigate in an unfamiliar environment.

With the success of iVote, there is a current opportunity to build on a proven system, take advantage of NSWEC's base investment in the core technology, and build an aggregated demand around a harmonised Australian-based electronic voting solution available to all jurisdictions.

Recommendation

It is recommended that the *Electoral Act 2002* be amended so that a limited category of electors (blind or with low vision, motor impaired, insufficient language or literacy skills, interstate and overseas) be allowed access to a remote voting system where their vote could be cast and transferred electronically, subject to regulatory protocols established by the Electoral Commission.