




eVolution not revolution

Electronic Voting
Status Report

2



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Executive Summary

The decision by the UK government to pilot several different e-voting systems at the May 2002 local government elections provided an opportunity to see whether there had been significant steps towards the resolution of security issues associated with e-voting. It also provided an opportunity to assess whether any of the pilots could form the basis for trials of e-voting in Australian elections.

The e-voting trials were evaluated against the following criteria: accessibility, secrecy of vote, accuracy, deliberation, security, authentication,

timeliness of results, and verifiability. The e-voting trials addressed these issues and demonstrated a number of technical solutions to security from an attack that would interfere with the elector's vote, and providing a level of confidence as to the identification of the elector at the time of voting.

The technology is now sufficiently mature to support trials of e-voting in Australia. This could be managed with minimum risk and would test both stakeholder and public acceptance of e-voting.

The technology is now sufficiently mature to support trials of e-voting in Australia. This could be managed with minimum risk and would test both stakeholder and public acceptance of e-voting for electors in special circumstances.

The Federal, State and Territory parliaments should amend their Electoral Acts to enable a trial of e-voting to be implemented at Federal, State and Territory elections for:

- Antarctic electors
- Electors in other remote locations
- Electors with a disability
- Overseas Electors
- and as an option for the return of postal votes.

Background

In 2000 a small delegation of representatives of the Australian Electoral Commission (AEC) and the Victorian Electoral Commission (VEC) visited the USA to observe first hand developments in the use of electronic voting and electronic vote counting at the Presidential elections.

The delegation's findings were published as "Electronic Voting and Electronic Vote Counting – A Status Report" in April 2001.

The report noted that Australia's systems of exhaustive preferential voting and proportional representative voting presented challenges for electronic voting systems, as the USA systems were designed for first past the post voting. The report observed that security of the Internet as a vehicle for voting remained an issue, with two aspects that need to be addressed. The first is to ensure that the system is not exposed to attack that would interfere with the elector's vote. The second is to provide a level of confidence as to the identification of the elector at the time of voting. These observations would apply equally to voting systems using telephones.

The report identified a number of possible next steps for electronic voting in Australia. These included Internet voting for Antarctic electors, Internet voting for overseas postal voters who apply in advance, touch screen voting in pre-poll voting centres as a service for non-English speaking voters and sight impaired voters, and overseas postal voting on a computer in an Australian overseas mission.

The decision by the UK government to pilot several different electronic voting, electronic vote recording and electronic vote counting systems at the May 2002 local government elections in England, was a significant step towards modernising an electoral system, by building public confidence in new systems and testing their technical robustness. A pilot of electronic vote recording and electronic vote counting was also being prepared for the general election in Ireland. With this in mind, a small delegation of representatives of the AEC and the VEC visited the UK and Ireland to observe first hand developments in electronic voting, electronic vote recording and electronic vote counting. It provided an opportunity to see whether there had been significant steps towards the resolution of security issues associated with electronic voting. It also provided an opportunity to see whether any of the pilots could be used to implement possible next steps for electronic voting in Australia.

Definitions

For the purposes of this report the following distinctions have been adopted between the terms "electronic voting", "electronic vote recording" and "electronic vote counting".

Electronic Voting

Any system where the elector casts their vote using an online system, such as the Internet, touch-tone phone voting using interactive voice recognition, mobile telephone SMS text facility, or interactive digital television. Once recorded, the elector's vote is despatched in real time to a secure electronic vote store, where it is held prior to counting.

Electronic Vote Recording

Any system where the elector casts their vote on a voting machine (punch card, push button, touch screen). Once recorded, the elector's vote is stored in the machine. After voting has concluded, data is transferred from each machine to a counting system.

Electronic Vote Counting

Any system where votes are loaded into a computerised counting system, which then tallies the votes and performs subsequent actions required by the particular method of voting being used, such as eliminating unsuccessful candidates and distributing their preferences or striking quotas and transferring the surpluses of successful candidates, thereby determining the successful candidate(s). The loading of votes can be undertaken in a variety of forms, such as keying ballot papers, scanning ballot papers using optical mark recognition (OMR) or optical character recognition (OCR) readers, downloading data from voting machines, or downloading data from an electronic vote store.

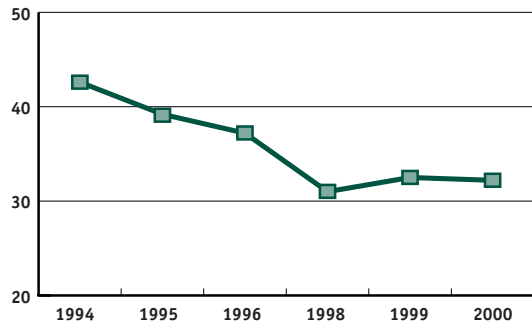
All three systems can be referred to collectively as e-voting.

Background to, and nature of, pilots in the UK local government elections

Voting is not compulsory in the UK. The UK government has become increasingly concerned by a declining participation rate, not only in local government elections but also in general elections. Participation for House of Commons elections dropped to 71.3% at the 1997 general election – then the lowest turnout since 1935. At the 2001 general election participation fell again to 59% (“Elections in the 21st Century: from paper ballot to e-voting”, Independent Commission of Alternative Voting Methods, Electoral Reform Society, January 2002).

Average participation in local government elections across the UK had declined from 45% in 1995 to 34% in 2000. Turnout was lower in England and Wales (see Table 1) and could be much lower for individual councils (for example, the Borough of Swindon had a 27.73% participation rate in May 2000, and this was an average over 22 wards).

Table 1. Turnout in Council Elections 1994 to 2000 England and Wales



The UK government, through the Home Office, commenced a program of electoral modernisation pilots at the May 2000 local government elections. These pilots focused on providing universal postal voting as an option to electors and were generally successful, with most postal pilots recording a 50% or greater rise in participation than in the previous elections in 1999. The 2001 general election saw a record number of postal votes cast – 1.4 million compared to 738,614 at the 1997 general election – but the overall participation rate still dropped to 59%. As postal votes were not arresting the decline in participation, the government sought other solutions.

The Department of Transport, Local Government and the Regions (DTLR) – which assumed responsibility for electoral policy after the 2001 government administrative restructure – sought greater council involvement in electoral modernisation pilots for the May 2002 local government elections. The passage of the Representation of the People Act 2002 enabled the parliament to make regulations for the conduct of pilots of different voting arrangements. As well as early voting, extended polling hours, and universal postal ballots, the councils conducting pilots were encouraged to include a wide range of electronic voting, electronic vote recording and electronic vote counting systems.

The UK government has a commitment to e-government (a senior cabinet minister – the President of the Council and Leader of the House of Commons – is also the government’s “e-Envoy”) and e-voting is seen as a logical component of an e-government program.

The DTLR invited tenders for the supply of electronic voting, electronic vote recording and electronic vote counting systems. After a detailed evaluation of the proposals received, a panel of successful suppliers was created. Councils were then invited to submit proposals for electoral modernisation pilots. Where proposals approved by the DTLR included e-voting, the councils selected an industry partner from the panel. The costs for successful e-voting proposals were met by the DTLR from a fund established as part of the UK government’s e-government commitment. The initial funding amounted to £3.5 million from a total of £350 million available to the e-Envoy for promoting e-government, and rose to £4.1 million during the election period.

Electoral modernisation pilots involving e-voting were expected to improve voter participation, build public confidence, test the robustness of the technology, and attract younger voters. The latter was considered important, as three out of four 18-24 year olds did not vote at the 2001 general elections. There was an expectation that the pilots, if successful, would lay the foundation for e-voting in a general election.

Thirty councils participated in the electoral modernisation pilots. Of these the delegation from the AEC and the VEC visited eight – Camden, Crewe and Nantwich, Hackney, Liverpool, Newham, St Albans, Sheffield and Swindon.

Background to, and nature of, pilots in the Irish national election

Ireland uses a proportional representation system of voting with multi member constituencies (42 constituencies with 3, 4 or 5 members). Transfers of surplus votes where a successful candidate has exceeded the quota are made from a random sample of the successful candidate’s votes. The accurate counting of votes and the determination of count results is a time consuming process. Voting is not compulsory and voter participation has declined over the past 10 years from a high of 73% to a participation rate of 65% at the previous general election.

The Irish government undertook to trial electronic vote recording and electronic vote counting to determine if it was easier to use than the traditional pencil and ballot paper, and provided earlier and more accurate results. Other drivers were to help promote a more positive image of Ireland in the use of information technology, and to provide more timely results for European elections.

In June 2000 the Department of Environment and Local Government invited tenders for the supply of an electronic voting and vote counting system. After a detailed evaluation of the proposals received, the Powervote/Nedap solution, called the Election Management System (EMS), was selected. The Department of Environment and Local Government quite deliberately chose not to select an Internet or telephone voting solution, as there was a strong perception that such a solution would not be well received by electors.

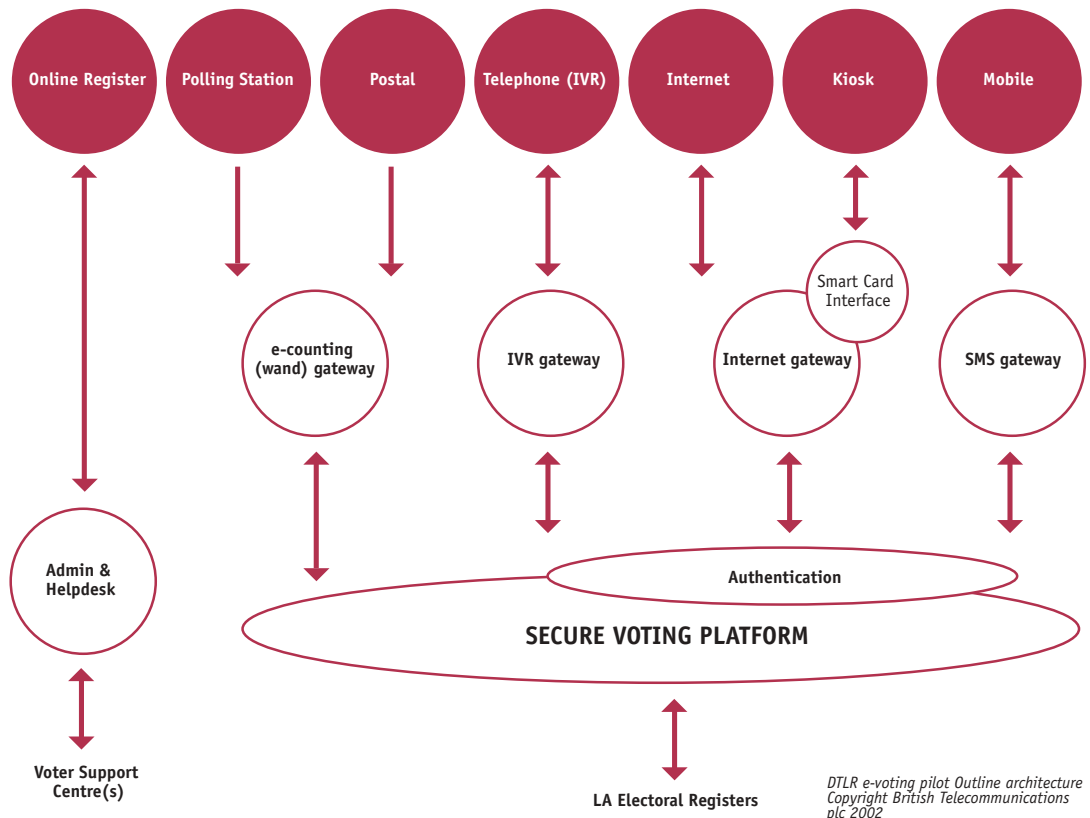
At the May 2002 general election, the EMS was trialed in three constituencies – Dublin North, Dublin West and Meath. In each polling place in these constituencies, voting machines replaced ballot boxes and all counting was undertaken electronically.

Electronic Voting, Electronic Vote Recording and Electronic Counting Systems

Most of the councils visited by the delegation from the AEC and the VEC used one or more of the above systems. For example Liverpool Council used Internet voting, mobile telephone SMS text voting and touch-phone voting (different types of electronic voting) and electronic counting of votes. The diagram at *Table 2* shows the network used by election.com and British Telecom to integrate electronic voting and electronic counting of votes for Liverpool Council and Sheffield Council.

Rather than discuss e-voting by council, this report examines each type of e-voting system observed in the UK and Ireland.

Table 2. Integration of Electronic Voting and Electronic Counting of Votes for Liverpool Council and Sheffield Council



Voting Machines

The Election Management System (EMS) used in Ireland includes the use of Nedap voting machines, ballot modules and dedicated Integrated Election Software (IES).

The Nedap voting machine replaces the ballot paper, voting screen and ballot box. It is located in the polling place (600 were deployed in Dublin North, Dublin West and Meath). It provides electors with a secure mechanism for recording their preferences for candidates by pressing buttons on a large screen panel and then casting their votes by pressing the "Cast Vote" button.

When an elector arrives at a polling place to cast their vote, they are first identified and marked off the register of electors. Instead of being handed ballot papers they are issued with a token, which they must present to the official in charge of the voting machine before being allowed to vote. The official then activates the voting machine. The elector views the ballot paper on the voting machine and selects preferences by pressing the buttons beside the candidate's name and photograph on the ballot paper.

Once the preferences are entered the elector presses the "Cast Vote" button to cast their vote. The official, who is positioned to the back or side of the voting machine, is made aware of this by a signal on the control unit, and deactivates the voting machine in readiness for the next elector.

The ballot module is a small portable electronic device, which is used for storing and transferring information between the IES system and the Nedap voting machine. The set-up of the election is programmed onto the ballot module and read by the voting machine. As votes are cast they are recorded on the ballot module. The ballot module utilises a system timer, which changes eighteen times per second in order to establish the random position of the next vote to ensure that a vote recorded cannot be linked with the elector marked in the register of electors. When the polling place closes, the ballot module is sent to the count centre and the votes are transferred from the ballot module to the IES system.

The IES system is a software package running on a Microsoft Windows computer, that allows the election official to set-up and record the details of an election (this information is transferred via the ballot module to each voting machine). When voting is completed the IES system receives the votes from each ballot module, counts the votes and displays the outcome of the count results in the format with which Irish electors are familiar.

The IES was first developed in 1988 in the Netherlands. Each country using this software (Netherlands, Germany and Ireland) has its own specific election rules incorporated into the software.

Kiosk and Touch Screen Voting

Newham Council used a touch screen voting system managed by Sequoia Voting Systems. Voters were able to cast their vote on polling day at conventional polling places by touching

Newham Council used a touch screen voting system managed by Sequoia Voting Systems. Voters were able to cast their vote on polling day at conventional polling places by touching a computer screen rather than by marking a ballot paper.

a computer screen rather than by marking a ballot paper. There was one voting machine in each of the 89 polling places. In addition, early voting using a voting machine was available at six locations around the council prior to polling day.

When an elector arrived at a polling place to cast their vote, they were first identified and marked off the register of electors. Instead of being handed ballot papers they were

issued with a smart card, which they inserted into the voting machine in order to activate it. The list of mayoral candidates was displayed first. The digital display prompted the elector to select the candidate they wished to vote for by pressing a screen area alongside the candidate's name (in the mayoral election, elector's voted for both their first and second choices). After completing the mayoral vote, the elector pressed "Next" to vote for ward councillors. A list of ward candidates was displayed and the elector repeated the voting process, selecting no more than three candidates (the voting machine selected the correct ward candidates to display from information on the smart card).

If the elector accidentally selected a candidate they did not intend to vote for, they could press the "Review" button. This displayed the elector's choices and allowed them to make a fresh selection. The lists of candidates on the screen followed the Royal National Institute of the Blind (RNIB) specifications for screen use by the sight impaired.

Once the elector had made all their selections (mayoral and ward councillors) they pressed "Touch Here to Vote" to record their vote. All of the voting machines recorded the vote in three places: a printed report produced by the machine's internal printer at the close of voting, a removable cartridge taken out after the polls closed, and the machine's internal memory. When the polling place closed, the cartridge was sent to the count centre and the votes were transferred to an electronic counting system.

St Albans Council used a touch screen voting system managed by Oracle in partnership with British Telecom (BT). Touch screen voting kiosks were available in five polling places for the adjacent Sopwell and Verulam wards between 8:00am and 9:00pm on 26 – 27 April 2002. Four of the polling places were in traditional locations. A new polling place was located in Sainsbury's supermarket. Electors for both wards could vote at any of the five polling places.



An advertisement designed to create awareness of e-voting options for the Sheffield local government elections.

Between 8 – 15 April 2002, the 10,000 electors in Sopwell and Verulam wards were mailed a poll card. The poll card had a 16 digit voter identification number (VIN), shown both as a number and as a barcode. Between 15 – 18 April 2002, a four digit personal identification number (PIN) was mailed to each elector. The VIN and PIN were mailed separately in order to ensure security. The same VIN and PIN were used for Internet voting and telephone voting.

Electors were instructed to bring both their VIN and PIN to the polling place. To vote using the touch screen kiosk, an elector selected instructions in either English or Bangala, and placed their poll card onto the kiosk under the screen in a marked-out space. The kiosk scanned the VIN automatically by reading the barcode on the poll card. The elector then entered their PIN using the number pads on the screen. Once VIN and PIN were accepted, a list of candidates was displayed. The elector selected the candidate for whom they were voting. They were then asked to confirm their selection or exit without voting. If the elector pressed "Confirm Selection" they were presented with a screen where the selected candidate's name was displayed and the elector was asked to either confirm their vote or change their selection (if they selected "Change Selection" they were taken back to the list of candidates).

If the elector pressed "Exit Without Voting" they were presented with a screen telling them that no candidate had been selected. They could confirm this vote (in other words, cast a blank ballot) or change their selection.

The completed vote was transferred to BT's secure data store, distributed across the UK, by an ISDN connection to each kiosk (either LAN or wireless, depending upon local requirements). Once electronic voting had closed, the data was loaded into an electronic vote counting system.

If an elector had misplaced either their VIN or PIN they were instructed to attend a polling place, bringing with them ID such as a driver's licence or a utility bill, and ask staff for assistance. If staff were satisfied that they could identify the elector, a replacement VIN or PIN would be issued.

Sheffield Council used a touch screen voting system managed by election.com in partnership with BT. Electors in the Hallam, Manor and Nether Edge wards were able to vote at public access kiosks established by the council around the city. Kiosks were located in the City Centre and all three wards. They were not limited to traditional locations and included a kiosk at the Fairleigh Housing Office and another at Caterknowle Food and Wine.

The 34,456 electors in the three wards were sent a Poll Card prior to 26 April 2002. The Poll Card was a smart card containing a personal identification number (PIN) that identified the elector and their ward. The PIN was shown as both a number and a barcode.

At the same time as the Poll Card, electors received a Password, candidate codes and information on how to use the touch screen voting system and other e-voting options.

Sheffield Council chose to send the Poll Card and the Password in the same mailout. The risk of Poll Cards being intercepted was evaluated against access and inclusion for the elector. It was considered that with two separate mailouts there was a greater risk of electors misplacing either the Poll Card or the Password.



CD Rom containing information about the local government elections in Sopwell and Verulam.

Voting using the touch screen voting system was available between 8:00am on 26 April and 9:00pm on 2 May 2002. Electors who attended a kiosk swiped their Poll Card and accessed the system using their Password. They then navigated the screen to vote for the candidate of their choice, confirmed their vote, and submitted it. The completed vote was transmitted to election.com's secure voting platform in Glasgow by an Internet connection. Once electronic voting had closed, the data was loaded into an electronic vote counting system.

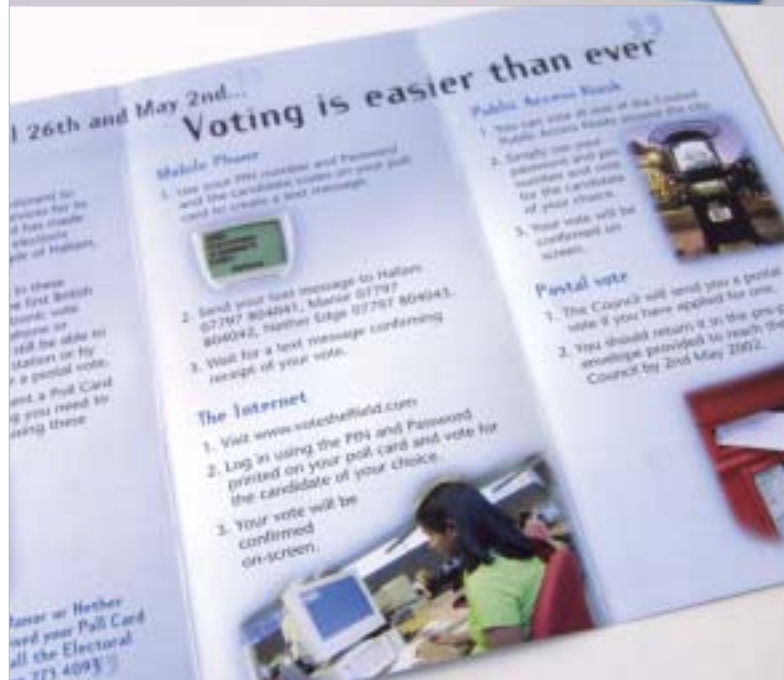
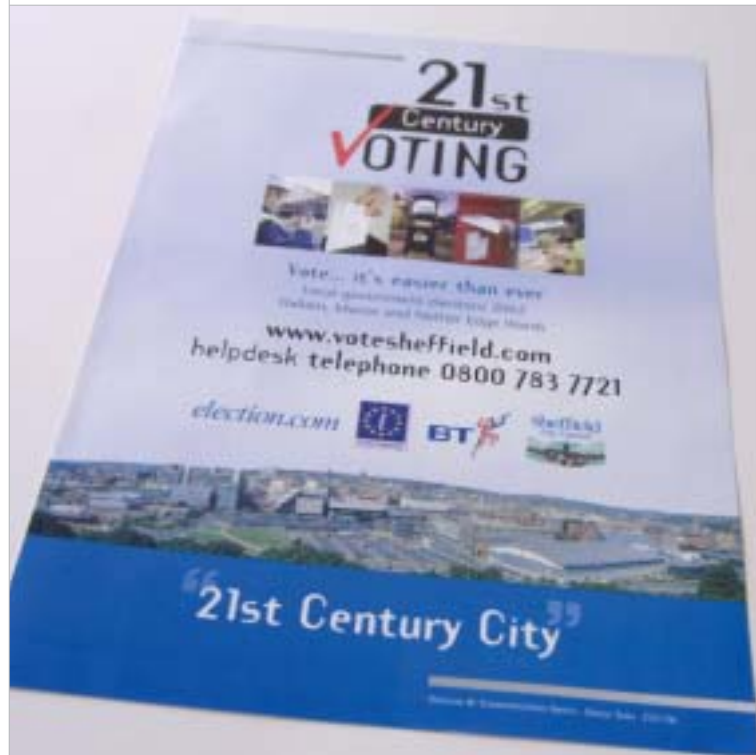
Internet Voting

Swindon Council used an Internet voting system managed by Electoral Reform Services in partnership with Votehere.net. Internet voting was available as an alternative to traditional voting arrangements to all of the 126,953 electors in the 19 (out of 22) wards in the borough that had an election, provided that they had their own Internet access (location independent access). The council did not provide Internet voting kiosks, although a mobile “roadshow” to demonstrate Internet voting was undertaken over six days prior to the commencement of polling. This was the first time that a full location independent Internet voting system had been applied to a statutory local government election in the UK.

Electors were able to vote on the Internet between 6:00am on 26 April and 12 noon on 30 April 2002. To vote by Internet, electors had to access the website and enter a unique personal ballot code number that had been allocated to them. These were randomly allocated numbers that were issued to electors in security sealed packages. The package also included instructions on how to vote and the voting website address. The packages were hand delivered under Council supervision and it was expected that it would be obvious to the elector if there had been tampering with their sealed package. If the elector had suspicions about tampering, they were instructed to contact the returning officer, who would cancel the original ballot code number and issue a replacement.

The ballot code number appeared in two parts – a six digit number and a four digit number – for ease of entry. Once the elector had accessed the Internet voting system they were presented with an on-screen ballot paper similar to a traditional ballot paper and screen prompts to assist the elector in completing their vote. The system would not accept a blank or otherwise informal vote. The completed vote was held in the secure vote store of Votehere.net located in Seattle, USA. Once electronic voting had closed, the data was loaded into an electronic vote counting system.

Liverpool Council and **Sheffield Council** both used an Internet voting service managed by election.com in partnership with BT. Internet voting was limited to two wards in Liverpool (Church and Everton) with a total of 21,593 electors and three wards in Sheffield (Hallam, Manor and Nether Edge) with a total of 34,456 electors.



Flyers designed to raise public awareness of internet voting for the Sheffield local government elections.

Internet voting was available to those electors with their own Internet access (location independent access).

Electors were sent a personal identification number (PIN), Password, candidate codes, website address and information on how to use Internet voting and other e-voting options. The PIN and Password were sent before 26 April 2002. For Sheffield electors the PIN was on the same Poll Card that they could use for touch screen voting.

Both councils chose to send the PIN and the Password in the same mailout. The risk of Poll Cards being intercepted was evaluated against access and inclusion for the elector. It was considered that with two separate mailouts there was a greater risk of electors misplacing either the PIN or the Password.

Voting using the Internet was available between 8:00am on 26 April and 9:00pm on 2 May 2002. The elector accessed the Internet voting system using their PIN and Password. Once the elector had accessed the system they were presented with an on-screen ballot paper similar to a traditional ballot paper and screen prompts to assist the elector in completing their vote. The completed vote was transmitted to election.com's secure voting platform in Glasgow. Once electronic voting had closed, the data was loaded into an electronic vote counting system.

One of the features of the election.com system was the Application Program Interface. This enabled data from e-voting from a number of different channels (Internet, kiosk, IVR, SMS text messaging, and paper ballot papers scanned by OMR) to be integrated on the same secure voting platform. This enabled the electronic vote counting system to count all votes cast in the election as a single process.

Crewe and Nantwich Council and **St Albans Council** both used an Internet voting service managed by Oracle in partnership with BT. Internet voting was limited to two wards in Crewe and Nantwich (Maw Green & Wynbunbury) with a total of 7,641 electors and two wards in St Albans (Sopwell and Verulam) with a total of 10,000 electors. Internet voting was available to electors that had their own Internet access (location independent access). Crewe and Nantwich also provided Internet access from a number of strategically located sites operated by the council.

Between 8 – 15 April 2002, electors in both councils were mailed a poll card with a 16 digit voter identification number (VIN). Between 15 – 18 April 2002, a four digit personal identification number (PIN) was mailed to electors in both councils. The VIN and PIN were mailed separately in order to ensure security.

Electors for both councils were able to vote on the Internet voting system between 9:00pm on 25 April and 9:00pm on 27 April 2002. To vote by Internet electors accessed the website, selected instructions in either English or Bangala, and entered their VIN and PIN. Once VIN and PIN were accepted, a list of candidates was displayed. The elector selected the candidate for whom they were voting. They were then asked to confirm their selection or exit without voting.

If the elector pressed "Confirm Selection" they were presented with a screen where the selected candidate's name was displayed and the elector was asked to either confirm their vote or change their selection (if they selected "Change Selection" they were taken back to the list of candidates).

If the elector pressed "Exit Without Voting" they were presented with a screen telling them that no candidate had been selected. They could confirm this vote (in other words, cast a blank ballot) or change their selection.

The completed vote was held in BT's secure data store, distributed across the UK. Once electronic voting had closed, the data was loaded into an electronic vote counting system.



To vote by Internet, electors had to access the website and enter a unique personal ballot code number that had been allocated to them. These were randomly allocated numbers that were issued to electors in security sealed packages.



Touch Phone (IVR) Voting

Swindon Council used a telephone voting system managed by Electoral Reform Services in partnership with Votehere.net. Telephone voting was available as an alternative to traditional voting arrangements to all of the 126,953 electors in the 19 (out of 22) wards in the borough that had an election, provided that they had access to either a mobile or fixed line touch tone phone.

Electors were able to vote by telephone between 6:00am on 26 April and 12 noon on 30 April 2002. To vote by telephone, electors had to enter a unique personal ballot code number that had been allocated to them. This was the same ballot code number used for Internet voting (see section 8 above for details of ballot code number production and delivery in Swindon).

Electors were supplied with full details of the candidates and the parties for which they were standing at the election, in the same package as their ballot code number. This was essential for telephone voting in order to minimise the length of the call. The telephone number for voting was a freephone number for fixed line calls. Calls from mobiles were charged to the mobile phone account.

The ballot code number appeared in two parts – a six digit number and a four digit number – for ease of entry. Once the elector had accessed the telephone voting system they were taken through an interactive voice recognition (IVR) script. The script gave each candidate's name and description, in ballot paper order, and asked the elector to indicate their preference by using the buttons on the phone. The system would not accept a blank or otherwise informal vote. The completed vote was held in the secure vote store of Votehere.net located in Seattle, USA. Once electronic voting had closed, the data was loaded into an electronic vote counting system.

Liverpool Council used a telephone voting service managed by election.com in partnership with BT. Telephone voting was limited to Church and Everton wards with a total of 21,593 electors, provided they had access to either a mobile or fixed line touch tone phone.

Electors were sent a personal identification number (PIN), Password, candidate codes, freephone number and information on how to use telephone voting and other e-voting options. The PIN and Password were sent before 26 April 2002. They were the same PIN and Password as could be used for Internet voting.

As discussed previously, the council chose to send the PIN and the Password in the same mailout. The risk of Poll Cards being intercepted was evaluated against access and inclusion for the elector. It was considered that with two separate mailouts there was a greater risk of electors misplacing either the PIN or the Password.

Voting using the telephone voting service was available between 8:00am on 26 April and 9:00pm on 2 May 2002. The elector accessed the telephone voting system using their PIN and Password. Once the elector had accessed the system they were taken through an interactive voice recognition (IVR) script. The script gave each candidate's name and description, in ballot paper order, and asked the elector to indicate their preference by using the buttons on the phone. The completed vote was transmitted to election.com's secure voting platform in Glasgow. Once electronic voting had closed, the data was loaded into an electronic vote counting system.

St Albans Council used a telephone voting service managed by Oracle in partnership with BT. Telephone voting was available to electors that had access to either a mobile or fixed line touch tone phone. The same VIN and PIN issued to electors for Internet voting could be used for telephone voting.

To vote using the telephone voting system an elector dialled the freephone number, selected instructions in either English or Bangala, and entered their VIN and PIN. Once the elector had accessed the telephone voting system they were taken through an IVR script. The script gave each candidate's name and description, in ballot paper order, and asked the elector to indicate their preference by using the buttons on the phone. The elector selected the candidate for whom they were voting. They were then asked to confirm or cancel their selection.

Once the elector confirmed their vote it could not be changed. If they cancelled their selection they were taken back to the list of candidates and asked to make another selection.

The completed vote was held in BT's secure data store, distributed across the UK. Once electronic voting had closed, the data was loaded into an electronic vote counting system.

Voting using Mobile Telephone SMS Text facility

Liverpool Council and **Sheffield Council** both used a Short Message System (SMS) text voting service managed by election.com in partnership with BT. Electors used the same personal identification number (PIN) and Password that they had been supplied for Internet voting.

Voting using SMS text messaging was available between 8:00am on 26 April and 9:00pm on 2 May 2002. Using their PIN and Password, and the candidate codes from their poll card, the elector created a text message:

```
<PIN>  
<PASSWORD>  
<CANDIDATE NUMBER>
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The text message was sent to a specific telephone number for the ward for which the elector was voting. The elector then received a text message reply, confirming the receipt of the vote.

The completed vote was held in election.com's secure data store in Glasgow. Once electronic voting had closed, the data was loaded into an electronic vote counting system.

Digital Television

Digital television voting systems (iDTV) were not used in any of the electoral modernisation pilots in May 2002. **Liverpool Council** expected to pilot e-voting using a local digital television service. In the proposed voting system, the elector needed access to a digital television and would access the voting system using an interactive menu. Once the system was connected, the elector would use the personal identification number (PIN) and Password from their voter card to authenticate themselves, and a ballot paper would be displayed on the television screen. The voter would then select the candidate for whom they wish to vote and submit the vote. Once confirmed, the voting details would be encrypted and sent to a central data store, prior to electronic counting. Liverpool, however, abandoned the digital television component of its multi-channel e-voting prior to the election for reasons that were not disclosed to the delegation.

Swindon Council is considering extending e-voting to include digital television as well as Internet and telephone voting for the May 2003 local government elections. Swindon is already cabled for digital television so it is expected that a realistic test of the technology could be undertaken.



Advertisement for the Liverpool Council election.

Public reaction in the UK to e-voting

One of the driving factors for introducing e-voting in the United Kingdom is concern about declining voter participation at national and local government elections. The actual number of voters in local government pilots who chose to e-vote is encouraging, if not overwhelming. It would seem that the e-voting initiatives at best stemmed the tide of declining voter participation.

Table 3 compares the use of different voting methods in the five councils that offered multiple option pilot schemes.

All of the councils that conducted e-voting pilots undertook surveys of voter participation and reaction to gauge the effectiveness of the pilot. The responses for Liverpool, Sheffield and Swindon are detailed below.

In **Liverpool Council** e-voting would appear to have contributed to an increased elector participation in the election. In Everton ward the turnout in 2000 was 16% while the turnout in 2002 was 18%. Although this was only 1,219 electors, 38.15% voted electronically. In Church ward the turnout in 2000 was 25% while the turnout in 2002 was 36%. Of the 5,438 electors who participated, 41.10% voted electronically.

In **Sheffield Council** the figures were similar. In Hallam ward the turnout in 2000 was 38.96% while the turnout in 2002 was 46.58%. Of the 6,679 electors who participated, 33.67% voted electronically. In Manor ward the turnout in 2000 was 17.89% while the turnout in 2002 was 21.91%. Of the 1,796 electors who participated, 16.98% voted electronically. In Nether Edge ward the turnout in 2000 was 31.93% while the turnout in 2002 was 38.65%. Of the 4,637 electors who participated, 36.17% voted electronically.

For both **Liverpool Council** and **Sheffield Council** participation in the local government election and take up of electronic voting were greater in the wards with a higher socio-economic status.

Swindon Council conducted exit polling to determine voter reactions to e-voting. 78% of electors who voted on line completed an on-line survey form. 61% of telephone voters also completed a survey form, as did 40% of voters in a polling station. It should be noted that e-voting was available in Swindon in all 19 wards where an election took place.

The average turnout for the whole council in 2002 was 31.23%, an increase of 3.5% on the 2000 election. From analysis of survey data approximately 60% of this increase came from electors who indicated that they only voted in this election because they could do so either by Internet or telephone and would not have voted otherwise.

Table 3. Multiple option pilot schemes: turnout by voting method

Council	Wards	Polling stations/ postal votes	%	Internet	%	Telephone	%	SMS Text Messaging	%
Crewe & Nantwich	2	1,839	83.5	364	16.5	-	-	-	-
Liverpool	2	3,957	59.4	1,093	16.4	1,162	17.4	445	6.7
St Albans	2	1,539	49.5	825	26.5	744	23.9	-	-
Sheffield	3	8,881	67.7	2,904	22.1	-	-	1,327	10.1
Swindon	19	33,329	84.1	4,293	10.8	2,028	5.1	-	-
Total	28	49,545	76.5	9,479	14.6	3,934	6.1	1,772	2.7

Internet and telephone voters were asked to indicate how confident they were that their vote was secret and would not be tampered with. Ninety six per cent of Internet voters were more confident than not that their vote was secret and 95% of telephone voters expressed the same view.

Asked if they found this method of voting more convenient than going to a polling station and would vote this way again, 96% of both Internet and telephone voters said yes.

Public Reports on e-voting in the UK

A report "The Implementation of Electronic Voting in the UK" (available from www.dtlr.gov.uk) was commissioned by the Department of Transport, Local Government and the Regions, the Office of the e-Envoy, the UK Electoral Commission, the Local Government Association, the Improvement and Development Agency and the Society of Local Authority Chief Executives. The report became available in May 2002.

The report found that the commonly held assumption that e-voting would substantially increase elector participation, particularly amongst younger electors, was not supported by the research. The same set of reasons that contributed to younger people, and people from lower socio-economic groups, not voting in a traditional election applied equally to e-voting.

The report also found that there is support for e-voting and that this support is growing. Twenty nine per cent of respondents to an e-government survey conducted by KPMG in 2001 indicated support for e-voting. Support should not be confused with demand, however, and focus group research has shown that many people who support e-voting would not necessarily use it themselves.

Telephone, Internet and interactive digital television were all considered good options for e-voting channels. Public terminals such as bank ATMs were not considered desirable because of privacy and access issues. SMS Text messaging was not supported, even amongst those who use it elsewhere, because it was seen to trivialise the election process ("The Implementation of Electronic Voting in the UK", Dr Lawrence Pratchet and the E-Voting Research Team, Local Government Association, May 2002)

A strategic evaluation report, "Modernising Elections: a strategic evaluation of the 2002 electoral pilot schemes" (available from www.electoralcommission.org.uk) was released by the UK Electoral Commission in August 2002.

The report benefited from the findings of three specialist reports: an evaluation of disabled access, produced by SCOPE (a national disability charity); public opinion surveys, conducted by NOP; and a technical evaluation, conducted by Price Waterhouse Coopers. These three specialist reports can also be accessed from the www.electoralcommission.org.uk website.

The Electoral Commission found that the hardware and software used for multi-channel and electronic voting performed successfully and without any significant problems. Time constraints arising from the rapid implementation of e-voting pilots meant that normal best practice could not always be followed and, in some pilots, security and testing documentation was not produced.

The report recognises that a minority of electors expressed concerns about security, although the Electoral Commission identified no evidence of fraud during the e-voting pilots. The report also recognises the concerns expressed by some about the potential loss of privacy and confidentiality from remote electronic voting.

The report concludes that e-voting has made a good start, but it would be premature to suggest that the UK Government is well on its way to delivering against its commitment to have an "e-enabled" election some time after 2006. Further piloting is necessary to tease out a number of issues and to establish further the security of e-voting ("Modernising Elections: a strategic evaluation of the 2002 electoral pilot schemes", UK Electoral Commission, August 2002).

In July 2002 the Office of the e-Envoy launched "In the Service of Democracy" (available from www.edemocracy.gov.uk), a national consultation paper on a policy for electronic democracy. The consultation process, to be completed by 31 October 2002, will contribute towards the development of national strategies for the use of information and communications technology (ICT) in "e-participation" (using ICT to connect politicians and the public between elections) and e-voting.

In August 2002 the Office of the e-Envoy launched an urgent consultation on a new set of security concepts for use in future e-voting pilots. The Communications Electronics Security Group (CESG), the UK Government's national technical authority for information assurance, undertook a high-level analysis of e-voting systems and procedures and made a number of recommendations.

The most significant was for the adoption of a trusted path between the voter's intention and what is recorded in the e-voting system. The CESG has outlined a technical approach using pre-encrypted ballots that could allow e-voting to be implemented for very large-scale elections. Industry responses to the CESG recommendations will feed into the "In the Service of Democracy" consultation.

Public Reaction in Ireland to e-voting

The general election was held on 17 May 2002. In the constituencies of Dublin North, Dublin West and Meath 138,000 electors (59% turnout) voted on the Nedap voting machines. An exit survey of 1,207 electors was conducted across the three constituencies.

Eighty seven per cent of interviewees preferred the electronic voting machine to the paper system. The preference was highest amongst electors in the 25-34 age group (95% preferred the electronic voting machine) and lowest amongst electors in the 65+ age group (77% preferred the electronic voting machine).

The most common favourable comment about the electronic voting machine was its ease of use (29% of interviewees). The most common negative comment was that the screen was too dark (13% of interviewees).

Ireland will be conducting a referendum in autumn 2002 and electronic voting will be extended to a further four constituencies. This will bring the total number of people who can vote electronically to over 500,000 or approximately 18% of electors.

Observations about e-voting in the UK and Ireland

What was observed in the UK was a major initiative in the use of e-voting in the Government sector. There has been considerable work done in the use of e-voting in the private sector but the UK work is a significant initiative in introducing e-voting into Government elections. There has been a lot of material written about the use of e-voting. There have been some very strong views expressed both for and against the use of e-voting particularly in the context of government elections. The UK experience was the first opportunity where a variety of e-voting strategies could be studied in a "real life" environment.

It is also important to note that any conclusions that can be drawn from these trials must be modest, as the trials were by no means large-scale electoral operations. To some extent, it is only when e-voting is conducted on a large scale that the technical infrastructure will be fully tested. Nevertheless, the value of this opportunity was to test some of the essential elements of free and fair elections in the e-voting domain.

The e-voting trials have been evaluated against the criteria established by Russell Smith from the Australia Institute of Criminology ("Electronic Voting: Benefits and Risks", Dr Russell Smith, Australian Institute of Criminology, April 2002). The key tests are as follows:

- *Accessibility*: The voting options are accessible and easy to use.
- *Secrecy of vote*: The elector's ballot must be secret.
- *Accuracy*: Each elector's vote must be recorded and counted accurately
- *Deliberation*: Voting should be taken seriously after due deliberation of issues.
- *Security*: Votes once recorded must be secure and free from manipulation and interference.
- *Authentication*: The voting system must safeguard against the risk of impersonation.
- *Timeliness of results*: Election results must be available in minimum time and distributed to the public and media.
- *Verifiability*: Election results must be able to be verified by way of traceable audits.

The following comments are based on observations and meetings with electoral officials and industry representatives. One of the first observations to make regarding the UK trials is that Australian voting systems are very different to the voting systems in the UK. Whereas in the UK first past the post is the voting system, in all Australian jurisdictions a form of preferential voting has been adopted by the parliaments for Government elections. This has an impact on the type of e-voting options that could be considered in Australia given the preferential voting systems. Australia has one of the highest voter participation rates for Federal and State elections in the world. Clearly, compulsory voting has a major effect on the voter participation rate. The UK by way of contrast had a 59% voter participation rate at the last general election and significantly lower participation rates at local government elections.



Accessibility

The present attendance voting arrangements at a polling place together with postal voting, early voting, absent voting and voting at interstate and overseas locations appear to provide an appropriate range of options to enable most Australian electors to participate in the democratic process. This is not to say that all Australian electors find it easy or convenient to access the present arrangements. The Australian Bureau of Statistics found that 36.1% of Australian households used the Internet from home in the week prior to the Census (7 August 2001). Usage of the Internet by households was much higher in urban areas: 41.4% in Sydney, 40.1% in Melbourne, 41.1% in Brisbane, 39.6% in Perth, 35.2% in Adelaide, 31.8% in Hobart, 36.7% in Darwin and 50.3% in Canberra. Based on these figures alone, e-voting could not replace the present paper based election arrangements. The idea that we will see the “big bang” approach to e-voting is most unlikely and is not supported by this report.

e-voting does provide real possibilities for providing further options for some electors who have difficulty accessing existing voting services.

However, e-voting does provide real possibilities for providing further options for some electors who have difficulty accessing existing voting services. Electors experiencing a disability and who find that either visiting a polling place or completing a paper ballot in the form of a postal vote is difficult may be better able to access the voting system via the Internet. There are now a number of computer applications used by people experiencing a disability that may also be able to be adapted to enable them to vote. For example, an elector experiencing vision impairment might find it easier to vote on an Internet site with a suitable screen reader and speech synthesiser technology. Electoral Commissions would need to establish protocols and procedures for providing this service but in terms of improving access and choices to electors in particular circumstances, e-voting is a real possibility.

The previous report commented that secure Internet voting may be an option for electors in remote locations (Antarctic electors) and electors voting at overseas locations (Australian overseas missions). This could also be extended to electors who live in remote parts of Australia where accessing the voting system by traditional means is problematic.

Secrecy of the vote

One of the principals underlying the Australian electoral system is that electors cast their vote in private having made up their mind without immediate influence from others. There is often some debate about the possibility of undue influence especially with regard to elderly electors. The polling place is a very public environment free from coercion where electors vote knowing that no-one will ever know how they voted. Once voting moves away from the supervised confines of the polling place, there is always a risk that vote secrecy may be compromised. Where electors vote at home by postal vote there is already the risk of vote secrecy being compromised. Nevertheless, stakeholders have accepted this level of risk as a

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manageable risk in order to enable these electors to vote. If additional voting options that move away from the traditional polling place are introduced, the level of risk to the secrecy of the elector's vote must be assessed. There is no simple solution to this issue. It is a matter of judgment as to whether the risk to secrecy of the vote by e-voting from home for certain electors can be managed. This issue is not confined to e-voting as it also applies to some local government elections

where the elections are conducted entirely by postal ballot. In these elections the increase in voter participation is judged to outweigh the risk of a possible compromise of the secrecy of an elector's vote.

On the other hand e-voting for certain electors may introduce the opportunity for more deliberation than presently is the case at a polling place.

Accuracy

Computers can count votes faster and more accurately than a manual count. The use of e-voting would enable more votes to be included sooner than would otherwise be the case. Electoral Commissions presently use customised computer applications to assist in the count of votes. There is general acceptance from key stakeholders of the value of using computers to count votes.

Deliberation

E-Voting enables electors to make their deliberation and decision in their own time. Unlike voting at a polling place, where there is often some time constraints on electors to mark their ballot papers, e-voting for certain electors would enable them to vote at their convenience. This may be especially important for electors experiencing a disability.

Security

In the UK, the industry service partners provided assurances that the various systems trialed were secure and able to withstand any attempted penetration. Research has identified that the present technical options for support to e-voting have some limitations. In summary, the technical limitations are:

- Service failure that may result in some electors being unable to vote;
- Viruses that may affect voting;
- Hacking into the computer application that may corrupt vote data or elector data;
- System capacity to cope with demands; and
- Power failure.

All of these issues need to be taken into account and considered as part of a risk management strategy. In themselves they should not be an impediment to introducing e-voting to certain electors but the risks need to be assessed and appropriate strategies put in place to minimise them. All forms of business conducted in the electronic environment contain an element of risk. The risk protection strategy needs to be in proportion to the assessed risk. The important point is to identify the points of risk and develop strategies to minimise the risk. The first step is to enable a small class of electors to e-vote.

By limiting e-voting to a small class of electors the risk of wide spread failure is minimised. In time Internet security will improve as the commercial world drives the process for added security. Electoral Commissions need to monitor this area and regularly evaluate security enhancements in the context of extending e-voting.

Authentication

One of the criticisms of e-voting is the possibility of voter fraud. However, the present system of personal voting at a polling place has little safe guards to protect against voter fraud. It may be more appealing, however, for a person to engage in voter fraud from a remote computer or an Internet cafe than it is to personally attend a polling place and vote in the name of another elector.

Any e-voting would have to include processes whereby the elector was registered and provided with an identification number and a password. Typically such processes would include:

- the Electoral Commission providing the elector with a unique personal identification number (PIN); and
- a shared secret known only to the elector and the Electoral Commission.

Much has been written elsewhere on the types of information that together provides a reasonable level of security.

The long-term solution of authentication lies in the area of public key infrastructure (PKI) cryptography and digital signatures. Until either government or the private sector makes this attractive for universal application, it is unlikely that the take up solely for electoral purposes would be sufficiently attractive having regard to the high costs.

All of the e-voting systems trialed in the UK produced a number of administration reports, including reports on multiple accesses from the same site and persons who tried to use a PIN or VIN more than once. The trials did not identify any issues regarding impersonation or voter fraud. There was no evidence of serious attempts to impersonate electors. By applying known security measures and limiting e-voting in scale to a class of electors, the risk of fraud is relatively remote and manageable.

Timeliness of result

Electoral commissions are constantly pressed by key stake holders (media and political parties) to speed up the vote counting process. In recent times there has been far more satisfaction with the speed of the count of votes on election night, especially since the introduction of the “two candidate preferred distribution of preferences”. This has meant the media and political parties have as much information as possible on election night to comment on the election.

The problem is that an increasing number of electors are voting by declaration vote (postal votes and absent votes), which means that there are an increasing number of votes that cannot be included in the count until the elector’s eligibility has been confirmed by way of checking against the electoral roll. If some electors were able to e-vote their eligibility to vote would be confirmed at the time of voting and their votes electronically counted.

In other words there would be more votes included in the count on election night and fewer votes to be determined after election day. This would mean that the stake holders would have even more information on election night than is presently possible.

There would be safe guards in place so that e-votes could not be counted before the close of voting.

Verifiability

Election results must be capable of being verified by electoral officials, scrutineers and ultimately by any court. In order to ensure that the source code complies with the legislation electoral commissions should be required to have any source code certified by an appropriate authority. Executable code should be open to any candidate, scrutineer or registered political party for their own verification. This is an important step in gaining public confidence in the integrity of the system.

Recent Developments in New Zealand

At the July 2002 general election, the New Zealand Chief Electoral Office introduced an Internet service to electors who were overseas at the time of the election. Overseas electors who were enrolled could download a ballot paper and a declaration from a secure Internet site. Electors were required to provide their name and address information and date of birth (which was a shared secret). Once electors downloaded the ballot paper, they were required to print it and, after marking the ballot paper and signing the declaration, fax it to the Chief Electoral Office.

This service was very well received by electors with some 20,000 electors using the service. There were no instances of attempted breaches of security. Once the faxed ballot paper and the declaration were received at the Chief Electoral Office the declaration and ballot paper were enclosed in a “special vote” envelope, which was forwarded to the returning officer.

The advantage of this system was that overseas electors could obtain their ballot material without having to rely on the mail service or attend an early voting centre at a New Zealand overseas mission.

Where to from here?

This report has canvassed the possibility of providing for a class of electors to e-vote. The possible classes of electors who are recommended for inclusion are as follows:

Electors in Antarctica

There is a strong case for enabling the electors working in Antarctica to vote using a secure Internet application. At the moment the only way for voters living at Australian Antarctic research bases to vote is by having ballot papers faxed to those bases. After the close of polls the Assistant Returning Officer for each base phones the votes through to a Returning Officer in Australia. Voting is not compulsory for Antarctic electors because the secrecy of the vote cannot be assured due to the processes used to transmit the results. E-voting would enable the right to a secret ballot to be restored to Antarctic electors. Antarctic electors are also prime candidates for Internet voting for two reasons: the Electoral Commission knows who they are, and the Antarctic bases are equipped with appropriate technology. There is minimum risk of impersonation as before the election the Electoral Commission could set up an appropriate security regime with each Antarctic elector. There is also minimum risk of a breach of secrecy of the vote. The Antarctic electors are well placed to be the first trial of e-voting for electors in a remote location.

Other Electors in remote locations

Throughout Australia there are a small number of electors who would benefit from being able to e-vote. Presently, these electors have to rely on voting by post. A regime could be established whereby electors in a designated remote location could register to become an e-voter. The Electoral Commission would then provide the elector with the necessary authentication to enable them to access the e-voting system at the time of an election.

Already in most jurisdictions there is a regime in place for electors living in remote locations to be registered as general postal voters. Once registered, the Electoral Commission forwards ballot papers to such electors at the time of an election. The concept of enabling certain electors to register as an e-voter would not be a huge leap forward and would offer greater choice and flexibility to the electors. There would be less reliance on the mail service, which in some locations can be problematic.

Electors with a disability

Electors who experience a disability would gain much from being able to register and then vote as an e-voter. Presently, electors with mobility and vision disabilities find it difficult to access the voting services that enable them to cast a secret ballot. Electoral Commissions have few options regarding making all polling locations friendly for electors with mobility disabilities as they do not own the buildings. Other electors, even if they can access a polling place, have difficulty casting a secret ballot as they may require the assistance of an electoral official or trusted friend to assist them to mark their ballot paper.

If the option was available for electors experiencing a disability to register as an e-voter, it would provide greater choice and options for these electors to access voting services. Whilst it would not be a total solution for all electors experiencing a disability it would at least provide greater diversity of choices.

The risks associated with this approach would be manageable risks as the number of electors would be small.

Overseas Electors

The previous report on Electronic Voting and Electronic Counting of Votes identified electors who know in advance of an election that they will be travelling overseas as a class of electors who could register as an e-voter and vote from overseas at an Australian overseas mission. It also identified that it may be possible to negotiate with the Department of Foreign Affairs and Trade to provide secure computer hardware in their overseas missions. Whilst this remains a possibility, it seems that a more straight forward approach may be to enable only those electors who have registered as an e-voter to be able to vote overseas. It would be possible to enable such electors to vote from an Australian embassy using publicly available hardware to access the Electoral Commission's e-voting site.

When the delegation visited Australia House and Victoria House in London, it appeared that such an arrangement would at least be feasible. This approach could even be limited in the first instance to London where the most number of overseas votes are issued. This would enable the Electoral Commission to evaluate the system and procedures in a trial environment with minimum risk to the election.

E-voting as an option for the return of postal votes

The options detailed above all have in common a process of registration as an e-voter by the elector in advance of any election. While this has the advantage of ensuring that the prospective e-voter is known to the Electoral Commission, it has the disadvantage of excluding those electors who had not registered, quite possibly because they did not realise prior to the announcement of the election that they would have a need to e-vote. For example, the vast majority of electors who vote overseas are not registered overseas electors (electors with a long-term overseas residency). They are casual travellers who happen to be overseas on polling day. This is a group that could be expected to have a high take up of e-voting but would be excluded by a registration process in advance of an election.

An alternative would be to offer e-voting as additional options for returning a postal vote. The elector would apply for their postal vote in the normal way and the Electoral Commission would dispatch to the elector postal ballot materials as well as additional information about an Internet address if the elector wished to return their vote using the Internet or a free phone number if the elector wished to return their vote using an IVR system. Another option would be for the elector to indicate their preference for normal postal voting or e-voting at the time they completed their postal vote application, and to be sent the appropriate material according to their selection.

As well as their postal voting material the elector would receive a personal identification number (PIN). The PIN, used in conjunction with another piece of personal information (the shared secret between the elector and the Electoral Commission), would have to be entered by the elector in order to gain access to the Internet or IVR e-voting system.

A postal voter would have the choice of returning their completed ballot paper in the traditional way through the post or by e-voting. E-Voting would be an alternative to traditional postal voting and not a substitute.

Enhancements would have to be made to the Electoral Commission's declaration vote scrutiny system to ensure that any elector who had access to multiple voting channels (traditional postal vote, Internet or IVR) would only have one vote admitted to further scrutiny.

Any elector who attempted to use several different voting channels, or one channel more than once, would be identified as a potential multiple voter and appropriate action would be taken under the multiple voting provisions of the relevant Commonwealth, State or Territory electoral act.

Trials and public discussion

This paper has raised the issues that came to the attention of the delegation in the study of electronic voting in the United Kingdom local government trials. The main issues that have surfaced are not new. The introduction of e-voting must be a gradual approach with careful assessment of the risks at all phases of the implementation. The possibility of e-voting provides a number of opportunities to provide greater access to voting services for Australian electors. It poses some very challenging issues that cannot be addressed without further debate. The technical barriers to wide spread implementation of e-voting are considerable. There are also the democratic issues of secrecy of the elector's vote, equal access to e-voting by voters and public confidence in the system. These issues must be debated and it is to be hoped that this report will encourage key stake holders to consider the way forward.

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Trials

The UK experience provided an opportunity to assess the possibility of a trial of e-voting. The time has come for a trial of e-voting to be held in Australia. This could be managed with minimum risk. It would enable stake holders to have access to the executable code in order to build their confidence. It would also test the public acceptance of e-voting for electors in special circumstances. There would be advantages in the Federal, State and Territory electoral authorities participating in such a trial so as to aim for a common system for the future.

The Federal, State and Territory Parliaments should amend their Electoral Acts to enable a trial of e-voting to be implemented at Federal, State and Territory elections for:

- Antarctic electors
- Electors in other remote locations
- Electors with a disability
- Overseas Electors
- and as an option for the return of postal votes.

Conclusion

The hurdles that must be overcome to successfully implement e-voting in Australian elections are not insurmountable. There is now more confidence than at the time of the US Presidential elections (November 2000) that technical solutions to security and privacy can be implemented to enable a limited number of electors to use e-voting. Many of the issues that have been raised, however, are not of a technical nature but are more to do with understanding and public confidence in an e-voting system.

The Electoral Commissions will have to play a key role in providing detailed implementation plans and demonstrating how the issues of privacy and security are to be addressed. The Parliaments need to participate in the debate, especially by providing the necessary legal authority for Electoral Commissions to undertake e-voting trials.

Australia has always been a leader in electoral democracy. Australians need to be aware that other jurisdictions are now taking the lead on the e-voting issue.

Victorian Electoral Commission 

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