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Electronic Voting in the 2001 ACT Election

Introduction

The fifth election for the Australian Capital Territory (ACT) Legislative Assembly was held on 20 October 2001. Seventeen Members of the Legislative Assembly (MLAs) were elected using the Hare-Clark voting method.[1] An important feature of this election was the use of electronic voting for the first time in Australian politics, with 8.33 per cent of ACT electors attending selected polling places to cast their vote on personal computers (pcs). Contrary to public perception, the 2001 ACT Legislative Assembly election was not conducted on the Internet.

Why and What

Technology currently underpins much of the Australian electoral process. Computer systems are used to count votes in some Australian jurisdictions, but traditionally votes have been cast by hand on paper ballots. The ACT Electoral Commission (the Commission) worked to achieve greater accuracy and greater speed in election results[2] by developing a system that could:

- provide electronic voting within four pre-poll centres around Canberra and at four additional polling places on polling day
- enter electors' preferences from paper ballots, and
- use a computer program to combine electronic voting data and data entered from paper ballots to undertake the distribution of preferences under the ACT's Hare Clark system.[3]

eVACS

On 19 April 2001, local company Software Improvements were contracted to develop the system later called eVACS, the Electronic Voting and Counting System. The front-end of eVACS supports voting. The back-end comprises a data entry system, and an algorithmic system to count votes and distribute preferences.

Voting

Eight Polling Places each featured 10 pcs networked locally to an isolated polling place server that contained removable media or 'zip' disks. Each booth contained a screen set into the booth top, a barcode reader and modified keypad.
Rolls were marked manually and voters randomly given a barcode containing a digital signature, electorate and polling place information. The eVACS voting procedure has been described elsewhere.[4] However, it is worth noting that this was the first Australian election to allow blind voters to cast their vote in secret. eVACS provided voters with spoken word instructions and candidate lists through disposable headphones.

Counting

Tally Room

At close of poll, polling place disks were removed, secured and couriered to the tally room. These and pre-poll eVotes were loaded onto the Election Night Server (ENS). ENS hosted the eVACS counting system, the uploading of results to the Commission website and the feed of results to the tally room display board. Paper votes were counted to first preferences at the polling places in the usual way, telephoned to the tally room and entered onto the ENS.

Post-election

On the Monday after the election, operators began keying over 175 000 paper ballots into the eVACS Data Entry System to finalise preference distribution. eVotes were re-loaded into eVACS so that all data was combined and held in one place. At the end of each day, entered ballots were counted by the eVACS Central Scrutiny Server. Scrutiny sheets were printed as a paper record of the day's count. Interim results were issued and loaded on to the Commission website.

Who Voted?

16 599 electronic votes were cast, short of the 20 000 hoped for by the

Commission.[5] Where electronic voting was an option, 45.28 per cent of votes were cast on eVACS. Pre-poll centres recorded an electronic vote of 46.9 per cent. There was a slight difference between electronic and paper ballots in first preference votes by party. Compared to all voters, a higher proportion of eVoters favoured the Australian Democrats and the ACT Greens. It is too early to predict whether any political party will benefit from the widespread introduction of electronic voting.
In the absence of exit surveys, we cannot build an accurate demographic profile of ACT eVoters.

Informal Votes

Informal votes accounted for 0.57 per cent of the total eVote. Paper vote informals ran at 4.3 per cent and this was within the expected range. Informals in 1998 were at 4.32 per cent and in 1995 the rate was 6.24 per cent of the total vote. It is reasonable to suggest that voluntary take-up of eVoting produces a lower informal vote.

Secure?

Protocols and contingencies were established in each polling place in order to prevent loss of data due to power, system, or hardware failure. The possibility of losing votes is regarded as 'negligible' by Software Improvements.
Any electronic process can be corrupted. However concern aired about eVACS was largely the result of the mistaken belief that 'electronic' meant 'Internet'. At no stage were

votes transmitted over the Internet. eVACS was a closed system and impossible to attack from outside. Software Improvements has also argued publicly that eVACS cannot be corrupted by technical staff and election officials. [6]

Downtime

The most obvious disruption to eVoting on 20 October was downtime. Two polling place servers experienced difficulties with one crashing for two hours allowing only 600 eVotes to be cast. eVACS went down at a third centre when a voter attempted to vote on the server rather than in a booth. Problems were resolved quickly and the eVACS communications protocol ensured no votes were lost. In future, all hired servers will need to be thoroughly load tested before election day to avoid future problems. Polling place design should be examined to ensure restricted access to servers.

Design Improvements

The Commission has acknowledged that improvements should be made to screen navigation, the quality of barcodes and the placement of certain instructions. This may alleviate frustration experienced by some voters and still guarantee a system that is 'sensible, useable and affordable'.[7]

Loading ... Loading ...

The Commission predicted that eVote indicative preferences would be available on their website early on election night. This raised media expectations of a quick eVote count which would act as a 'giant, deadly, accurate opinion poll'.[8] While interested parties were provided with more information more quickly than in past elections, the decision to host website, eVACS and the tally room Board on a single server meant that each step of the count was slowed considerably. Raised expectations meant that eVACS was perceived as disappointingly slow.

Was the Count Quicker?

The Commission anticipated that the eVACS count would be substantially quicker than physically moving piles of papers to count preferences. They estimated that data entry would take around a week to complete.[9] The distribution of preferences was completed by eVACS on 1 November.

On this evidence it is not possible to be sure of eVACS' ability to deliver a quicker result.

1995 Count took 10 days.
74 candidates.
1998 Count took 22 days.
108 candidates.
2001 Count took 12 days.
94 candidates.

More Accurate?

eVACS's counting algorithm was independently audited twice to ensure no errors occurred during the distribution of preferences. eVACS back-end was transparent and observed by Party scrutineers. Operator error occurred during data entry but eVACS ensured that these were eliminated before the count took place. It is accepted that human error is a part of any manual count of preferences. It may be that the complexities of counting Hare-Clark are more accurately handled by an electronic, not human, count.

Cost

Full election costings are not yet publicly available. However, the Commission advises that the ACT eVACS trial cost $406 000 over 2000–2001 and 2001/2002 financial years.

The Future

It seems likely that technology will play an even larger part in future ACT elections. In 2000 Electoral Commissioner Phil Green wrote that the introduction of electronic voting would be a proof of concept trial used to explore the Commission's concerns about security and voter identity. While the eVACS trial was not conducted on the Internet, its successful implementation 'could see the ACT move to Internet voting at the 2004 election'.[10]

Other Australian Electoral Commissions sent observers to the ACT election. While some jurisdictions are exploring the possibilities offered by electronic and Internet voting, none have yet decided to adopt the approach pursued by the ACT for geographic and logistical reasons.[11]

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Endnotes

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3. Provision of an electronic voting and vote counting system: invitation to tender, *Canberra Times*, 11 December 2000, p. 17.
4. ACT Electoral Commission, 'The electronic voting process' in *Electronic Voting: technical description of how it works* at http://www.elections.act.gov.au/EVACS.html
5. ACT Electoral Commission Annual Report 2000–2001, p. 8.
6. I. Lowe, 'Securing the Vote Electronically' New Scientist, 5 January 2002, p. 35.
7. A. Purvis, Deputy ACT Electoral Commissioner, email to author, 27 September 2001.
8. C. Hull, 'Electronic voting should show early results on the night', *Canberra Times*, 16 October 2001.
9. Purvis, op. cit.
10. P. Green ACT Electoral Commissioner, 'The Internet and the electoral process' in The Politics of the Future: the Internet and Democracy in Australia, 5 October 2000, p. 5.
11. Discussions and email communication with other electoral jurisdictions.

Further reading:
G. Humphries, presentation speech to ACT Electoral Amendment Bill 2000 at http://www.elections.act.gov.au/adobe/EvotePS.pdf

Russell G. Smith, 'Electronic Voting: Benefits and Risks', Australian Institute of Criminology Trends and Issues in Crime and Criminal Justice No 224, April 2002.
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