

CONSULTATION PAPER

EXAMINATION OF THE FEASIBILITY OF SCANNING BALLOT PAPERS AT THE 2008 ELECTION

The purpose of this consultation paper is to enable the ACT Electoral Commission (Elections ACT), in consultation with local industry, to investigate the use of intelligent character recognition (ICR) technology to input handwritten preferences contained on ACT Legislative Assembly ballot papers into the existing electronic voting and vote counting (eVACS) system for counting the 2008 ACT Legislative Assembly election.

We welcome your comments on the system sought. This consultation paper can be downloaded from the BASIS website (www.basis.act.gov.au).

We encourage all suppliers to register their details online on the BASIS website. Once suppliers are registered on BASIS, ACT Government procurement officers will be able to:

- Identify you as a potential supplier for agency procurement officers to seek quotations: and
- Send information on tenders to you via e-mail.

ACT Electoral Commission

Establishment of a scanning solution for hand written ballot papers for the 2008 ACT Legislative Assembly election

Consultation Paper

Introduction

The ACT Electoral Commission (Elections ACT) is responsible for the conduct of elections for the Legislative Assembly. The next election will be held on 18 October 2008.

Elections ACT introduced its electronic voting and counting system (eVACS) at the 2001 ACT Legislative Assembly election. The program was used again at the 2004 election. At both elections all votes not cast electronically were handwritten by voters on ballot papers, and after election day, the handwritten data contained on the ballot papers was entered by data entry operators into the eVACS program. At both elections over 170,000 ballot papers were data entered twice by different operators and verified by supervisors.

Elections ACT wishes to investigate the feasibility of using an intelligent character recognition (ICR) scanning solution to replace data entry of paper ballots.

Any tender for a scanning solution will be informed by consultation with sector stakeholders including those who respond to this consultation process.

Goals

The goals of changing the counting process from data entry to scanning are:

- To have a proven and accurate alternative way of entering hand written ballot papers into eVACS;
- To count the election in the fastest, most accurate way possible; and
- To reduce the cost of the count.

Background

The ACT's Electoral System

The ACT has a relatively complex electoral system. The system used is the Hare-Clark single transferable vote system of proportional representation. 17 members are elected from 3 electorates (Brindabella, Ginninderra and Molonglo), with Brindabella and Ginninderra returning five members each and Molonglo returning seven members. The ACT's voting population is estimated to be just over 226,000 electors.

The ACT has fixed term elections every four years with the next parliamentary election due to be held on 18 October 2008. The ACT Electoral Commission also regularly conducts smaller non-parliamentary elections using Hare-Clark.

Voters in the ACT are the only electors in Australia able to cast their votes for a parliamentary election electronically. Electronic voting is made available at a small number of polling places. Ideally the ACT Electoral Commission would like to extend electronic voting to all electors of the ACT, equipping all polling places with electronic voting. Unfortunately cost and logistics of equipping 84 polling places presently precludes this from occurring. The Commission is carefully watching advances in technology so that if a cost effective and portable alternative for delivering electronic voting becomes available, electronic voting will be expanded.

At the 2004 election 28,169 electors voted electronically and 176,340 electors cast paper ballots.

Voters are asked to number candidates in the order of their preference, using sequential numbers starting at 1. To be formal a ballot paper must contain at least a single 1. Candidates are listed on the ballot papers in columns, with registered political parties and unregistered non-party groups given their own columns. Independent candidates are listed together in another column.

Samples of the ballot papers are available on the Commission's website at <http://www.elections.act.gov.au/BallotPapers.html>

The order of the candidates' names in each column is changed from one ballot paper to another using a system called Robson rotation. This system gives every candidate an equal chance to appear at each position in their column on the ballot paper. In the Molonglo electorate there are 420 versions of the ballot paper. In Brindabella and Ginninderra there are 60 versions of the ballot paper. Each version of the ballot paper is marked with a numerical version number.

Voters must vote for candidates, they do not have the option of voting for parties.

By way of example, at the 2004 election there were 33 candidates in the electorate of Molonglo, with each voter having the option of showing sequential preferences from 1 to 33. From almost 85,000 ballot papers around 7% of voters numbered all 33 candidates. Most voters (71%) numbered exactly 7 preferences in Molonglo, which is the minimum they are instructed to number.

On election day at the close of the poll all paper ballots are unfolded and counted to first preferences in the polling place and bundled according to the candidate for which the first preference is indicated. Following first preference results being relayed to the tally room, the ballot papers are transferred, with batch sheet covers, to a central location ready for electronic capture, presently by data entry.

The Commission wishes to investigate replacing data entry of ballot papers with scanning of ballot papers.

Preliminary Specifications

In preparation for the October 2008 election Elections ACT is looking for an electronic system that will scan ballot papers, be able to read and interpret hand written numbers, allow for correction and verification of the captured data and provide an output file that is able to be read by eVACS.

Scanning

The system must:

1. Be capable of scanning ballot papers of three different sizes and colours for the three ACT electorates. The ballot papers may vary in height between 210mm (Brindabella, Ginninderra) and 255mm (Molonglo) while the width is dependent on the nominations received. For example, in 2004 Brindabella was 300mm and Ginninderra and Molonglo were 420mm wide. As a contingency, scanning of ballot papers on a paper width larger than that mentioned above will need to be considered when submitting capabilities.
2. Be capable of scanning 200,000 security marked ballot papers that have been folded and unfolded. Some of the papers may be damaged by spilt food, contain tears or may have been mended with sticky tape.
3. Scan ballot papers which have numbers marked by electors using a variety of writing implements. In most cases ballot papers will be marked with grey pencil.
4. Scan and capture data from batch cover sheets (which may be of a different thickness to ballot papers) including a handwritten candidate's name and a handwritten number.
5. Ensure that each ballot paper is individually scanned and that no ballot papers are missed or duplicated.
6. Have the ability to capture and track batches of varying numbers of ballot papers. Batches will be identified by the candidate who received the first preference, the electorate, the polling place and batch number creating an easily followed audit trail. This information will be included on the batch sheet covers.

7. Be able to scan ballot papers at a secure facility in Canberra (this could be Commission premises) in the presence of a considerable number of scrutineers who represent the candidates and are encouraged to observe all aspects of the counting process.
8. Ensure ballots are scanned in polling place order generally from A-Z.
9. Allow for any nominated scanned paper to be viewed on screen (eg to allow for random sampling, accuracy check or where a request has been received from a scrutineer).

Intelligent Character Recognition

10. As each ballot paper is scanned, the scanning software must:
 - (1) Determine which Robson rotation version of the ballot paper has been scanned. (There will be 60 versions of the Brindabella and Ginninderra ballot papers and 420 versions of the Molonglo ballot paper. Each version will have an numerical version identifier.)
 - (2) Read all marks written anywhere on the ballot paper other than the pre-printed information.
 - (3) Categorise each ballot paper according to whether it can be confirmed for counting automatically, or whether it needs to be verified by an officer;
 - (a) A ballot paper will be confirmed for counting automatically if:
 - (i) The scanner is able to determine the Robson rotation version;
 - (ii) It contains a series of numbers written inside the ballot squares on the ballot paper, being an unbroken sequence of unique numbers commencing with 1 (eg 1, 2, 3, 4, 5, 6, 7) – a single “1” is acceptable;
 - (iii) No extraneous information is marked outside any ballot squares;
 - (iv) The ICR software is confident to within 99% (or better) accuracy that it has correctly interpreted the handwritten numbers;
 - (v) The ballot paper does not contain a “declaration” stamp where the ballot paper is contained in an “ordinary vote” batch (a ballot paper containing a “declaration” stamp is acceptable where the batch is designated as a batch of postal votes or declaration votes).
 - (b) A ballot paper will be tagged as needing verification by an electoral officer if:
 - (i) It contains a series of numbers written inside the ballot squares on the ballot paper, including one or more duplicated numbers in the sequence (eg 1, 2, 3, 4, 4, 5, 6, 7);
 - (ii) It contains a series of numbers written inside the ballot squares on the ballot paper, including one or more missing numbers in the sequence (eg 1, 2, 3, 4, 6, 7);
 - (iii) It contains two or more figure “1”s;
 - (iv) It appears to be blank;
 - (v) The ICR software is not confident to within 99% accuracy that it has correctly interpreted the handwritten numbers;
 - (vi) It contains characters other than numbers in one or more ballot squares (such as ticks, crosses, letters or other non-numeric characters);
 - (vii) The ballot paper contains a “declaration” stamp where the ballot paper is contained in an “ordinary vote” batch;

- (viii) It contains writing or marks outside the ballot squares; or
 - (ix) The scanner is unable to determine the Robson rotation version.
11. The system must provide for manual correction of identified scanning errors. Errors manually corrected must be verified by a second electoral officer before being accepted for counting.

Quality

12. The solution should ensure scanning of a high quality and ensure that ballot paper information is read with 100% accuracy following manual verification.

Timing

13. It is expected that scanning could begin on the day after polling day. The solution should allow for a daily output of verified data for loading into the counting system to ensure daily interim election results can be released between the Monday following election day and the end of scanning and verification.
14. Postal ballot papers can be accepted for counting up to close of business on the Friday following polling day. Ideally, all ballot papers should be scanned, verified and accepted ready for final loading into eVACS soon after close of business on the Friday following polling day.

Interfaces and File Format

The system must:

15. Be capable of exporting results data from scanned ballot papers progressively to the eVACS system via a closed network or by CD-Rom.
16. Allow for transfer of data to the eVACS system in such a way as to eliminate the possibility that data could be accidentally or deliberately lost, altered, copied or stolen.
17. Be capable of producing an ASCII SQL file of votes for acceptance into eVACS.

Backup

The system must:

18. Provide backup processes for all scanned data to ensure that all admitted paper ballots are counted and included in the final result.
19. Provide backup for equipment and power failure and technical expertise on-call while scanning is occurring following the election to ensure results are delivered in the time specified.

Training

20. The vendor must provide for training and training resources on the use of the system to Electoral Commission staff.

Documentation

21. The vendor must provide accurate, complete and up-to date documentation for the scanning system to the Commission.

Software code

22. Ideally, the software for scanning and optical character recognition will be open source software. At the very minimum, programming code must be:
- available to be independently audited;
 - provided to candidate and party scrutineers for verification; and
 - available to the Court of Disputed Elections should the election be in dispute.
23. Once the code has been tested, audited and accepted the complete code must be certified by the Commissioner and locked so no further changes can be made.

Testing

24. The scanning and ICR solution must be tested to ensure that “what goes in is what comes out”. This will involve testing of individual modules, end-to-end testing, comparison of hand counted ballot papers and the output from the scanning system, comparison of scanning to data entered ballot papers and load testing to the satisfaction of election participants prior to acceptance of the system.

Reports

The system should provide:

25. Reports which compare the number of scanned ballot papers for a polling place with the number counted in the polling place (as recorded on batch cover sheets).
26. Reports which compare the number of scanned first preference votes in each polling place for each candidate with the number of first preference votes counted for each candidate in the polling place (as recorded on batch cover sheets).
27. Batch reports including reports outlining which batches have been scanned from each polling place, which batches contain ballot papers that have a missing or duplicated number, are informal, illegible or are difficult to interpret, which batches have been corrected and are ready to be counted, which batches are still to be finalised and reports which outline changes approved by supervisors for a batch.

Consultation Strategy

The purpose of this consultation paper is to seek feedback on the likelihood of fulfilling the preliminary specifications.

Written submissions to this Consultation Paper are encouraged, as the outcomes of the consultation will inform the development of the Request for Proposal.

Written Submissions

The aim of a pre-tender consultation process is to maximise opportunities for local industry, including the opportunity for local suppliers to compete for the provision of services to Elections ACT.

Should a Request for Proposal be issued, it may vary from the information or material that is presented in this Consultation Paper. Elections ACT will bear no responsibility for any such variations.

Any enquires may be directed to Alison Purvis, Deputy Electoral Commissioner, ACT Electoral Commission on 6205 0224.

Written submissions in response to the Consultation Paper may be made to:

The Electoral Commissioner
ACT Electoral Commission
PO Box 272
CIVIC SQUARE ACT 2608
Email: elections@act.gov.au

By COB on 17 May 2006