Technology Assisted Voting Audit

Pre implementation report

7 March 2011

NSW Electoral Commission

iVote Audit Report

Review fieldwork performed:	18 January 2011 – 4 March 2011
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DISTRIBUTION LIST

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1 Introduction

PricewaterhouseCoopers (PwC) has been engaged by the NSW Electoral Commissioner to undertake an audit of the technology assisted voting application, iVote, in compliance with the *Parliamentary Electorates and Elections Act 1912*, amendment No. 41, division 12A.

2 Background

Parliament requested the Electoral Commissioner to investigate the feasibility of remote electronic voting for vision-impaired and other disabled persons, with the primary objective being to enable a secret vote for people who are blind or vision impaired. It was concluded that a technology assisted voting application was feasible although to meet the NSW State Election in March would be tight.

On 24 November 2010 the *Parliamentary Electorates and Elections Act* was amended. The Bill was agreed in principle to provide blind or vision impaired people of NSW the ability to vote in secret using a computer or telephone at a private location such as their home. A further amendment was made on 7 December 2010 to include persons unable to vote by reason of location.

The Bill requires an independent audit of the technology assisted voting system both before and after each general election to ensure that it properly reflects the votes cast and that it is secure. This will allow tests of the iVote system software to ensure that it is accurate and that the secrecy of votes is protected, with the system resistant to hackers and any other malicious tampering. Governments must be prepared for an unforeseen failure of the iVote systems technology and have in place contingency plans.

The following Audit requirements exist for the iVote Remote Electronic Voting System and are in accordance with the Draft Amendment Bill to *Parliamentary Electorates and Elections Act 1912*, No 41, Part 5, Division 12A, 120AD: Independent Auditing of Technology Assisted Voting:

(1) The Electoral Commissioner is to engage an independent person (the independent auditor) to conduct audits of the information technology used under the approved procedures.

(2) Audits under this section are to be conducted and the results of those audits are to be provided to the Electoral Commissioner:

(a) at least 7 days before voting commences in each Assembly general election at which technology assisted voting is to be available, and

(b) within 60 days after the return of the writs for each Assembly general election at which technology assisted voting was available.

(3) Without limiting the content of the audit, the independent auditor is to determine whether test votes cast in accordance with the approved procedures were accurately reflected in the corresponding test ballot papers produced under those procedures.

(4) The independent auditor may make recommendations to the Electoral Commissioner to reduce or eliminate any risks that could affect the security, accuracy or secrecy of voting in accordance with the approved procedures.

3 Objectives and Scope

The audit objective is to review the iVote Remote Electronic Voting System in accordance with the *Parliamentary Electorates and Elections Act 1912*, No 41, Part 5, Division 12A, 120AD: Independent Auditing of Technology Assisted Voting. This will include a review and assessment of:

- Electronic Voting Test Standard
- Electronic Voting Test Strategy and Plan
- Electronic Voting Test execution
- Electronic Voting Business Continuity processes
- Electronic Voting Pre Implementation readiness

An Electronic Voting Post Implementation review will be conducted within 60 days after the return of writs.

4 Conclusion

The *Parliamentary Electorates and Elections Act 1912* has been amended to make provision for technology assisted voting for persons with impaired vision or with certain other disabilities and for persons unable to vote by reason of location. The amendment was assented and commenced on 7 December 2010. This has placed considerable time pressure on the delivery of the technology assisted voting solution, iVote in time for the March NSW State Election. This coupled with the challenges in communicating with the iVote software vendor, EveryOneCounts, operating out of the United States of America has meant little or no contingency time exists in the project schedule.

To combat the challenges of a compressed delivery timeframe the project has engaged leading experts in the field of electronic voting bringing in-depth knowledge of like implementations across Australia, England and North America. In addition rigorous testing has been undertaken by 3rd party security consultants to determine security vulnerabilities in both the voice and web components of the solution.

In order to test the iVote application a Testing Standard was prepared drawing from European and American standards for e-voting. The Test Standard forms the basis of testing and sets out the minimum standard for conformance of the iVote system. A document that cross references the Test Standard to the tests undertaken is being prepared but was not fully completed at the time of our report.

Our review has established that test votes cast in accordance with approved procedures were accurately reflected in the corresponding test ballot papers in version 3.69 of the iVote software currently under test. However there are still critical tasks remaining that are necessary in ensuring the readiness of the iVote application and supporting infrastructure including disaster recovery testing prior to implementation scheduled for 14 March.

The first cycle of security testing has been performed resulting in several security vulnerabilities being identified. The security vulnerabilities have been documented and submitted to the vendor for resolution and further

clarification. The next cycle of security testing, scheduled for the 7 March, will be performed on the latest code drop, version 3.69, which has attempted to resolve all critical issues. The results of these tests and clear analysis of the implication and likelihood of any remaining security vulnerabilities will be critical in the go/no go decision.

The effort required to complete the remaining tasks in the available time, the vendor responsiveness to outstanding queries, and the resource availability need to be fully quantified and managed closely. Task prioritisation and critical path analysis should be performed immediately to allow the NSW Electoral Commissioner clear visibility of remaining activities and decision points prior to the publicised 14 March launch of iVote. The decision to go live should be based on the level of residual risk and whether this is at an acceptable level to maintain vote integrity, reliability and accuracy.

Detailed observations on critical focus areas are provided in Appendix A.

5 Acknowledgement

We wish to acknowledge the assistance and co-operation received from staff and management during the course of this review.

Mark Driessen
Partner

Appendix A – Detailed Observations

Key Risk Area	Observation	Priority
Testing	The first cycle of security testing has been performed against the practice system and significant security vulnerabilities where highlighted in the preliminary Stratsec report. The issues should be formally responded to by EveryoneCounts and NSWEC. A test completion report prepared by NSWEC should summarise the testing performed and conclude on the testing results. Actions required to mitigate or resolve issues raised during testing should also be included.	High
	Prior to a go live decision testing should be completed on the final software and hardware configuration. This should include functional and regression testing. A full end to end dress rehearsal including the security key ceremony and all participants that will have a role in iVote should also be performed. Ballot information will be loaded prior to 14 March and should also have an audit trail to confirm accuracy.	High
	The traceability matrix which links testing with the Test Standard to ensure completeness needs to be finalised prior to implementation.	High
	Usability and accessibility test completion reports have been prepared and contain a number of issues to be addressed. These issues require analysis to determine whether they can be remediated prior to 14 March and further testing if required.	Medium
Risk Management	A risk log has been developed however there is not a consolidated log across all areas of the project. A consolidated risk log, including infrastructure risks, should be developed that clearly shows the risk, the likelihood and impact and how this is being mitigated or accepted. This log will be a key input into the go/no go decision process.	High

Key Risk Area	Observation	Priority
Go/no go checklist	A go/no go checklist should be developed as soon as possible to ensure that clear criteria is established and adhered to in the process to decide to proceed.	High
iVote operating procedures	The application architecture document that describes the end to end process from voter registration to vote counting and election closure should be completed. By formalising key documentation it provides different areas of the project with a consistent overview and confirms roles and responsibilities.	High
	All iVote documentation should be centrally managed and should be available to the project team in both hard and soft copy with appropriate version control.	High
Monitoring	At the time of the review application and system monitoring had not been fully defined. Monitoring of the application had not been fully described by the vendor and testing had not been conducted to ensure required events are logged and escalated appropriately.	High
Service continuity	A business continuity plan had not been developed to fully describe disruption scenarios. It is essential that probable events are planned for and a clear understanding of how the system can be recovered to maintain vote integrity. In the event of e-voting services being disrupted a process to inform registered voters should be developed. In addition the recovery time objective had not been defined to enable testing of the disaster recovery components. A definitive position should be established on what recovery time objective needs to be established to support the voting process and whether the IT infrastructure and associated processes support this objective.	High
	The recovery time objective had not been defined to enable testing of the disaster recovery components. A definitive position should be established on what recovery time objective needs to	High

Key Risk Area	Observation	Priority
	be established to support the voting process and whether the IT infrastructure and associated processes support this objective.	