Make *every vote count*
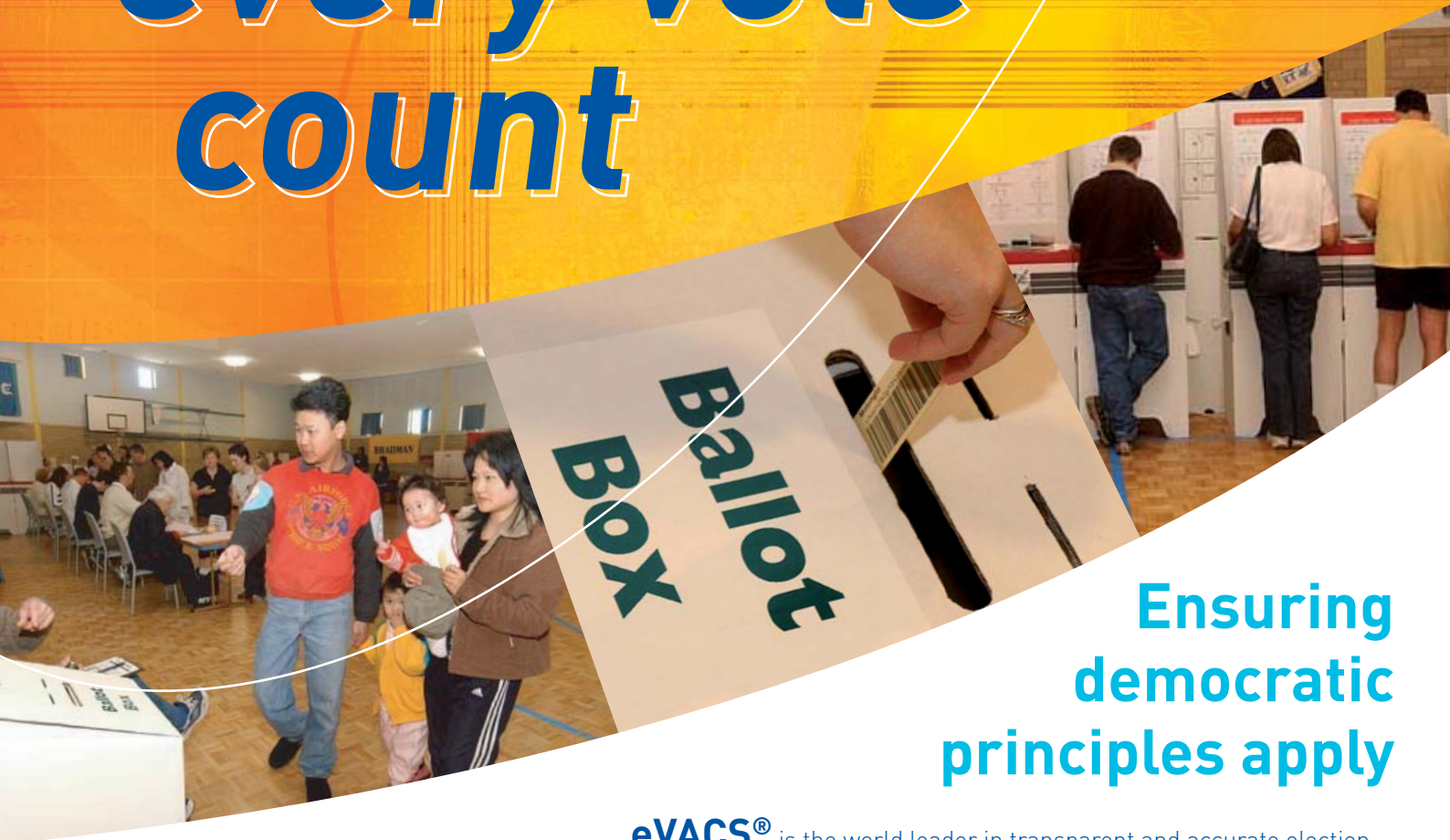
Ensuring democratic principles apply

Electronic voting is now an accepted reality. It is increasingly being used by governments, corporations, shareholder groups and associations that are seeking ways to enhance the integrity of the voting process.

As its use has become more wide-spread and the technology is better understood public consideration has turned away from the "nuts-and-bolts" questions such as "How can we achieve this?" to more basic concerns such as "How can we ensure that these systems meet all the requirements of a democratic election process?"

The concerns are not trivial and deserve thorough scrutiny. For without integrity, accuracy, security and a built-in concern for democratic election principles, no voting system can maintain long-term viability.

It was from this background that eVACS® was developed.

eVACS® is the world leader in transparent and accurate election software. Developed in 2001, it is a modular electronic elections system that maintains the key requirements of all parliamentary elections. It ensures:

- **Privacy during voting;**
- **Authentication of the vote;**
- **Avoidance of coercion;**
- **Empty ballot boxes at the start of polling;**
- **Security of ballots, and**
- **One vote per person.**

eVACS® handles the simplest to the most complex of elections, including first-past-the-post elections, multi-member proportional representation and preferential (single transferable vote [STV] proportional) or majority systems.

eVACS® ensures election integrity. It is completely secure and has a proven track record in providing credible election results.

eVACS® is reliable and purpose-built to cope with infrastructure disruptions. Even if power or equipment failures occur, votes cannot be corrupted.

The primary purpose of eVACS® is to collect and count votes electronically with greater security, no impingement of voter's rights and more anonymity than current paper-based systems.

eVACS®

Electronic Voting
and Counting System

Equality in voting

Equality in voting requires that every voter has the opportunity to cast a ballot in secret. In reality however many people who are vision impaired, have poor reading skills or are unable to write require assistance at the ballot box, removing or reducing their ability to vote anonymously.

eVACS® removes this problem, providing:

- Simple keypad operation;
- Easy localisation and multiple language capabilities;
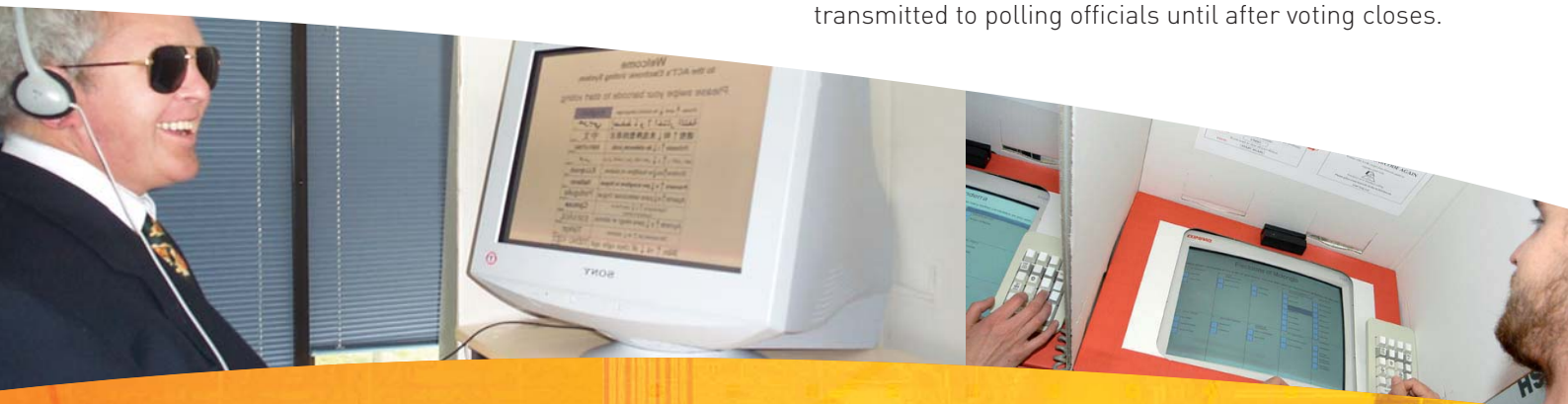- Large screens and/or audio instructions over headsets for the vision impaired.

Secrecy

eVACS® offers complete ballot secrecy with no other person able to see a constructed vote on screen. Even in the event that a voter requires assistance, the screen allows a vote to be hidden while assistance is provided.

Security

Security is built-in to the design and operational aspects of both hardware and software. **eVACS®** includes auditing and internal security features to ensure that an election result is accurate and verifiable. Its features include:

- Automated set-up that ensures an election is run from a series of auditable write-once CDs;
- Limited functionality to voters and officials, removing the possibility of software being modified during an election;
- Software loading to reformat the hard disk(s), thereby removing any existing operating system or other software;
- Barcodes to determine in which election(s) a voter may participate, plus an inability to use the barcode for more than one vote;
- Voting conducted in public polling places over isolated LANs and stored on physically secure voting servers;
- Storage of votes in two separate databases to guard against hardware failure, and
- Downloading of votes at the end of polling which requires password and encryption keys, neither of which are transmitted to polling officials until after voting closes.

Succeeding in Australia's National Capital

Located between Sydney and Melbourne, the Australian Capital Territory is Australia's federal and political capital.

In 2001, with an ACT Legislative Assembly election looming, the ACT Electoral Commission certified **eVACS®** as its electronic voting, counting and data entry system - the first time that an Australian government election would involve electronic voting.

A multi-member proportional election system, the ACT follows the Hare-Clark rules. All electorates have either five or seven members.

Given the multicultural nature of the Territory, the Commission specified twelve languages that had to be available to voters: Arabic, Chinese, Croatian, English, Greek, Italian, Persian, Portuguese, Serbian, Spanish, Turkish and Vietnamese.

Audio capabilities were also included to allow vision impaired electors to vote secretly for the first time in Australia.

Many voters cast their ballots electronically, with the remainder using paper ballots which were then data entered into **eVACS®**.

Transparency

Transparency is critical in election processes. We expect transparency in paper-based ballots through the involvement of observers monitoring the counting process. Electronic voting should offer the same level of rigour.
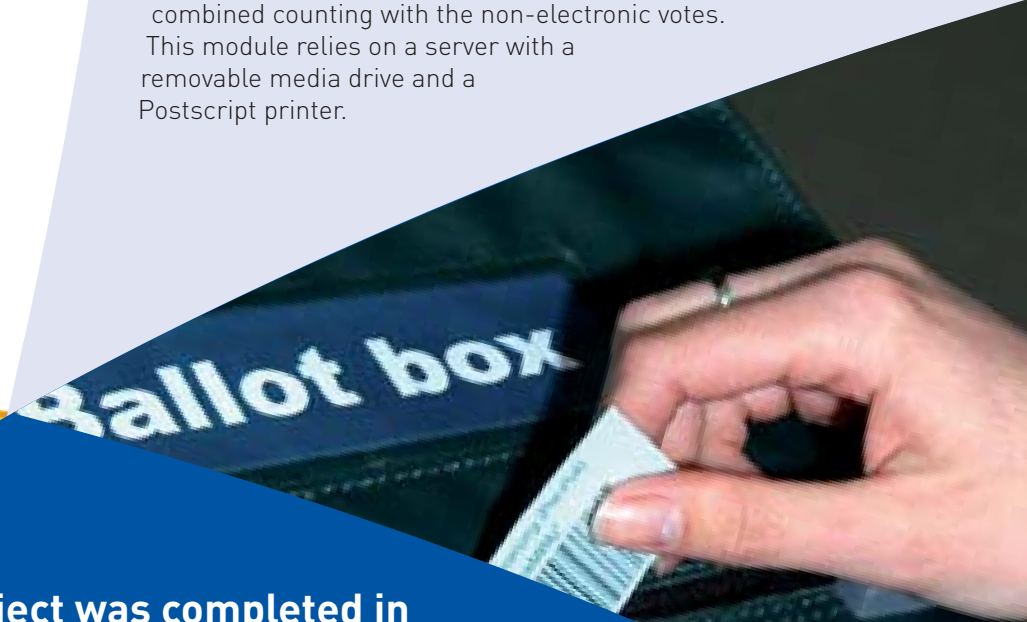
eVACS® has a degree of transparency unavailable with most electronic election software alternatives. It has a well-documented paper trail. All development documents and code have been independently audited and source code is available to electoral authorities for scrutiny.

Integrity

eVACS® has been extensively tested and audited against the detailed design specification and acceptance test cases and procedures developed in accordance with Institute of Electrical and Electronics Engineers (IEEE) software engineering standards. Tests have included parallel scrutiny of manual counting and **eVACS®**; ease-of-use testing for all aspects of the system; load testing; and simulations of the entire election process.

In addition, the software code is independently audited, certifying that it:

- can neither gain nor lose votes,
- faithfully implements the algorithm for vote counting, and
- is written in a consistent, structured and maintainable style.

Modular means choice

eVACS® is a modular system that operates on any hardware that supports the Linux operating system. It is simple to set-up the system and to use on election day, requiring no additional effort from scrutineers or polling station volunteers.

As yet few polls can do away entirely with paper-based ballots. The **eVACS®** modules allow for mixing and matching, using voting machines or PCs at appropriate high-traffic locations, complemented by paper-based ballots that are then scanned or data entered into the vote database.

The **eVACS®** modules are:

Election Set-up:

Allows an election official to specify the election data such as candidates, parties and electorates (districts or regions) for an election

Electronic Voting:

Voting with **eVACS®** is conducted using a keypad and barcode reader attached to a standard PC or voting machine. These are in turn connected to an isolated LAN at each polling centre. The LAN server has two hard drives and a removable media drive. Vision impaired voters use the same equipment but with a larger screen and headphones.

Non-Electronic Votes

Requiring only standard PCs operating off a server, the Non-Electronic Votes module enables paper votes to be securely scanned, or data entered, into the vote database.

Counting and Election Results Reporting

Enables initial counting of electronic votes and then combined counting with the non-electronic votes. This module relies on a server with a removable media drive and a Postscript printer.

> **"The project was completed in a very short timeframe (contract let April 2001, election held October 2001) and the system that was provided was of the highest quality. The support provided to the Commission by Software Improvements throughout the project and during the election was excellent with the working relationship being one of mutual trust. "** Elections ACT
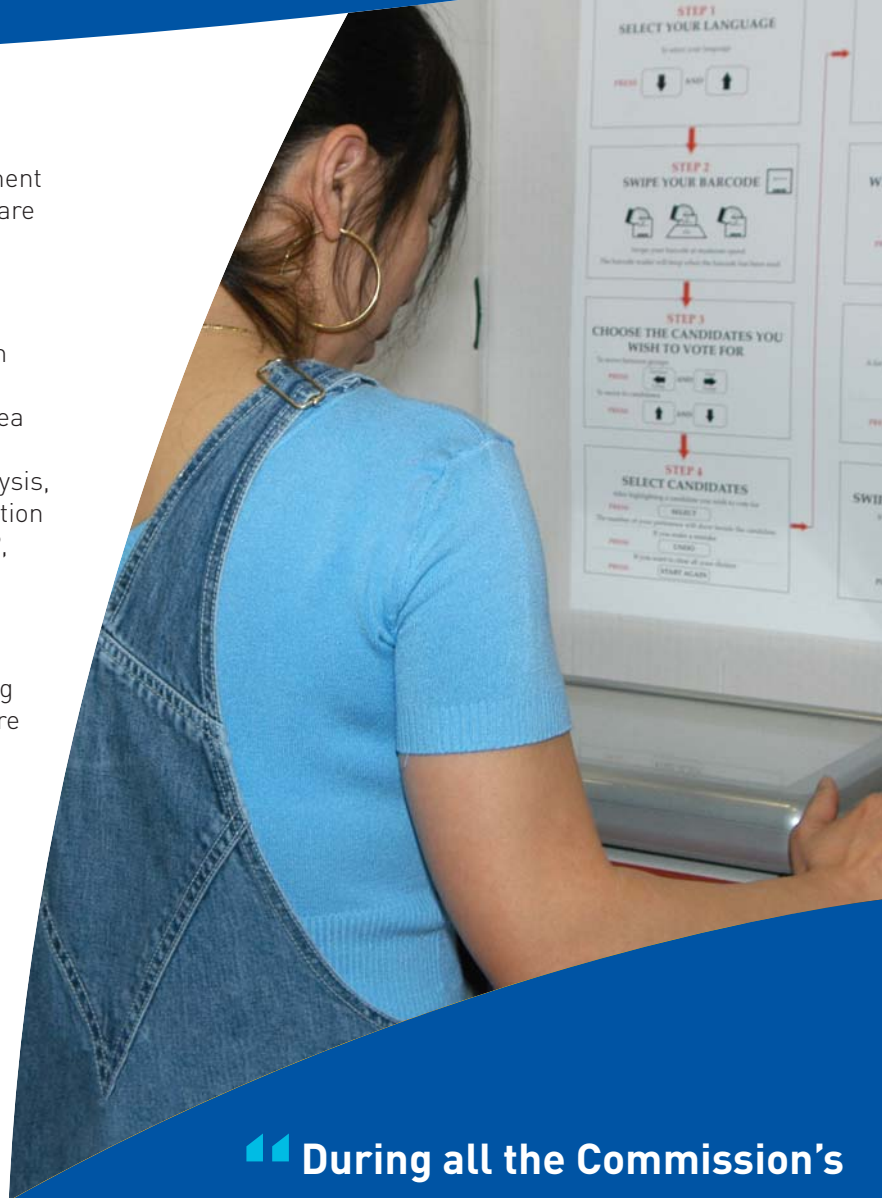
Commitment, Integrity and Experience

Established in 1992, Software Improvements provides products, services and tools to corporate and government customers throughout the world. Committed to software engineering excellence, we have been involved in developing high integrity, mission critical applications for many years.

Projects include the development and provision of high integrity Electronic Voting and Counting Technologies, and unique Project Auditing tools. Expertise in this area has led to a close working relationship with the ACT Electoral Commission and thus experience in the analysis, design, implementation and testing of large scale election systems. It was through this relationship that **eVACS®**, the world leader in transparent and accurate election software, was created.

Software Improvements applies these same proven software engineering skills and processes to producing high quality software outcomes and increasing software competencies through guidance and training for all of our customers.

eVACS® is proof of this commitment

> **During all the Commission's dealings with them, Software Improvements showed that they are a professional organisation capable of providing intelligent and reliable services in a timely and efficient manner. I recommend them to you highly.**
>
> **Phillip Green**
> **Electoral Commissioner,**
> **ACT Electoral Commission**

Photography courtesy of the ACT Electoral Commission