An Enabler or Disabler to Strengthening Electoral Democracy?

REPORT ON E-VOTING SEMINAR
11 and 12 March 2013, Cape Town, South Africa
ACKNOWLEDGEMENTS

The Electoral Commission of South Africa (IEC) acknowledges the following for their roles and expertise in making the seminar a success: the IEC commissioners; Mr Surendra Thakur of the Durban University of Technology; Dr Margaret McGaley of the Department of Computer Science at the National University of Ireland; Shri VS Sampath, Chief Election Commissioner of India; Judge Paulo Tamburini, member of the Electoral Commission of Brazil; Ms Beverly Thakur, Head of the International Foundation for Electoral Systems in the Philippines; Mr Peter Wolf of International IDEA and Mr Troy Hector of Telkom. The Commission also acknowledges the presence and contributions of ideas of key electoral stakeholders in South Africa: leaders of political parties, members of the Portfolio Committee on Home Affairs, ambassadors, Chapter 9 institutions such as the South African Human Rights Commission (SAHRC), the Independent Communications Authority of South Africa (ICASA), the Commission for Gender Equality (CGE), National Treasury, members of the Party Liaison Committee (PLC), the Africa Institute of South Africa (AISA), representatives of the United Nations (UN), all other civil society organisations and, finally, senior management of the IEC.
CONTENTS

LIST OF ACRONYMS AND ABBREVIATIONS ................................................................. 3

EXECUTIVE SUMMARY .................................................................................................. 4

CHAPTER 1: INTRODUCTION AND OVERVIEW ....................................................... 5
  1.1 Contextual Background .......................................................................................... 6
  1.2 Inauguration .......................................................................................................... 7

CHAPTER 2: OVERVIEW OF E-VOTING – CROSS-NATIONAL EXPERIENCE ...... 9
  2.1 MR SURENDRRA THAKUR, DURBAN UNIVERSITY OF TECHNOLOGY, SOUTH AFRICA, .................. 10
  2.2 QUESTION AND ANSWER .................................................................................. 12

CHAPTER 3: COUNTRY CASE STUDIES .................................................................. 13
  3.1 IRELAND – DR MARGARET MCGALEY, DEPARTMENT OF COMPUTER SCIENCE, NUI MAYNOOTH, IRELAND, AND SPOKESPERSON FOR IRISH CITIZENS FOR TRUSTWORTHY E-VOTING ............................................................................. 14
  3.2 INDIA – SHRI VS SAMPATH, CHIEF ELECTION COMMISSIONER OF INDIA......................... 18
  3.3 PHILIPPINES – MS BEVERLY THAKUR, HEAD OF THE INTERNATIONAL FOUNDATION FOR ELECTORAL SYSTEMS IN THE PHILIPPINES .................................................. 22
  3.4 BRAZIL – JUDGE PAULO TAMBURINI, MEMBER OF THE BRAZILIAN NATIONAL COUNCIL OF JUSTICE AND MEMBER OF THE ELECTORAL COMMISSION ...... 25

CHAPTER 4: KEY LESSONS LEARNED FROM THE INTERNATIONAL EXPERIENCE.... 27
  4.1 MR PETER WOLF, INTERNATIONAL IDEA, LEAD AUTHOR OF INTRODUCING ELECTRONIC VOTING: ESSENTIAL CONSIDERATIONS ................................................... 28

CHAPTER 5: ICT & TELECOMS INFRASTRUCTURE .............................................. 31
  5.1 INFRASTRUCTURE REQUIRED TO SUPPORT E-VOTING AND COUNTING: MR TROY HECTOR, ACTING MANAGING EXECUTIVE: GOVERNMENT BUSINESS SERVICES AND LARGE BUSINESS SERVICES, TELKOM ........................................... 32
  5.2 QUESTION AND ANSWER .................................................................................. 34
CHAPTER 6: PLENARY DISCUSSION AND REFLECTIONS ON THE WAY FORWARD FOR SOUTH AFRICA ................................................................. 35
  6.1 PLENARY DISCUSSION ....................................................................................................................... 36
  6.2 RECOMMENDATIONS ...................................................................................................................... 37
  6.3 CLOSING REMARKS – VICE-CHAIRPERSON OF THE IEC, COMMISSIONER TERRY TSELANE ................................................................................................. 37
  6.4 CONCLUSION .................................................................................................................................. 37

CHAPTER 7: APPENDICES .................................................................................................................. 39
LIST OF ACRONYMS AND ABBREVIATIONS

ACDP - African Christian Democratic Party
ANC - African National Congress
DA - Democratic Alliance
DoELG (Ireland) - Department of the Environment and Local Government
DRE - Direct Recording Electronic
EBP - Electronic Ballot Printer
EVM - Electronic Voting Machine
ICASA - Independent Communications Authority of South Africa
ID - Independent Democrats
IEC - Independent Electoral Commission
PCOS - Precinct Count Optical Scanning
PLC - Party Liaison Committee
SAHRC - South African Human Rights Commission
UDM - United Democratic Movement
UN - United Nations
VVPAT - Voter-Verified Paper Audit Trail
EXECUTIVE SUMMARY

One of the strategic objectives of the Independent Electoral Commission (IEC) is to ensure that the institution remains a pre-eminent election management body that seeks continuous improvement and innovation through the use of technology. To this end, the Commission aims to strengthen electoral democracy in South Africa, and to position itself as a trend-setter in election management in Africa. In an effort to attain these goals the IEC convened a multi-stakeholder seminar on Electronic Voting and Counting Technologies on 11 and 12 March 2013 in Cape Town, South Africa. The seminar, which sought to assess the feasibility of electronic voting (e-voting) in South Africa by drawing on lessons learned from comparative experiences, was the first of its kind in South Africa. It served as a platform for key electoral stakeholders to gain an understanding of e-voting by interrogating its feasibility in South Africa. It was critical for South African electoral stakeholders to engage in a discussion of such an exploratory venture in order to establish the groundwork for future consensus on e-voting.

In light of the country-specific experiences set out during the seminar it was noted that e-voting has produced mixed results, with success in countries such as Brazil, India and the Philippines, while, in others, like Germany and Ireland, the technology has been abandoned for various reasons. The overarching recommendation from those attending the seminar was that should South Africa choose to embark on e-voting, the process should be underpinned by the country’s unique socio-political and economic realities. Given that South Africa is considering using election management technology that has been abandoned by others, the delegates also recommended that an expanded, focused research study of the technology should be conducted. This will, in effect, deepen the understanding of the inadequacies of e-voting with a view to instituting remedial measures in South Africa should the technology be adopted.

This report, which documents the proceedings of the seminar, consists of six chapters. The first gives a background to the discourse on e-voting in South Africa by drawing on lessons learned from comparative experiences, was the first of its kind in South Africa. It served as a platform for key electoral stakeholders to gain an understanding of e-voting by interrogating its feasibility in South Africa. It was critical for South African electoral stakeholders to engage in a discussion of such an exploratory venture in order to establish the groundwork for future consensus on e-voting.

The second and third chapters consist of country cases studies (Brazil, India, Ireland, and Philippines), while chapter four synthesises the international lessons that have been learnt. Chapter five assesses the infrastructural conditions of South Africa and its level of preparedness for a possible e-voting venture. The sixth and final chapter proffers recommendations in view of the foregoing findings by way of critically evaluating the lessons learnt elsewhere and the level of the country’s preparedness in juxtaposition to the utility of e-voting.
CHAPTER 1

INTRODUCTION AND OVERVIEW
1.1 CONTEXTUAL BACKGROUND

His Excellency Kgalema Motlanthe, the former President (September 2008-May 2009) and current Deputy President (from May 2009 to date) of South Africa, challenged the country to explore the possibility of e-voting in the aftermath of the 2009 national and provincial elections. Similarly, the South African Parliamentary Portfolio Committee on Home Affairs, to which the Independent Electoral Commission (IEC) reports, has shown an interest in e-voting. The exploration of e-voting corresponds to one of the IEC’s Strategic Objectives – ensuring that the institution remains a pre-eminent election management body that seeks continuous improvement and innovation through the use of technology. The use of technology is not unusual in the electoral process in South Africa. Since its inception, on 17 October 1996, as a constitutionally-mandated permanent electoral management body in South Africa, the IEC has sought to be a trend-setter in electoral democracy. From voter and candidate registration to results management and other aspects of the electoral process, the IEC has effectively appropriated technology and has indeed become an institution of reference on election management in Africa and beyond. Thus, employing technology in voting would, for the IEC, be another element in consolidating its experience of the management of technology for elections, albeit in another critical aspect of the electoral process.

E-voting has been adopted in various countries in the world, both developed countries such as the United States of America, Japan, Ireland, Canada, France, Belgium, Austria and Switzerland and developing countries such as Brazil, India, Russia, Paraguay, Philippines, Kazakhstan, Venezuela, and Estonia. Because of the different circumstances pertaining in these countries the practice of e-voting has produced varied results, some successful, others unsuccessful. By 2011 five countries had abandoned e-voting. One of them was the Netherlands, the first country to have introduced e-voting (some 20 years ago). The others were Germany, the United Kingdom, Ireland and Australia. The main reasons for abandoning e-voting were concerns about data security, verifiability and certification and cost. However, e-voting has also produced certain benefits in some geographically vast and populous countries such as India and Brazil by allowing for the speedy processing of election results.

The IEC, conscious of these varied experiences and prompted by the need to gain greater understanding of e-voting and to seek broad-based consensus on this critical venture, convened a multi-stakeholder seminar on Electronic Voting and Counting Technologies on 11 and 12 March 2013 in Cape Town, South Africa. The seminar was the first of its kind in terms of initiating dialogue focusing on e-voting technologies and was the culmination of a study of e-voting conducted by the IEC in December 2011. The seminar was attended by key electoral stakeholders such as political parties, civil society organisations, representatives of the diplomatic corps, National Treasury, the Truth and Reconciliation Commission, the United Nations and the Chapter 9 institutions including the South African Human Rights Commission, the Office of the Public Protector, the Independent Communication Authority of South Africa, the Commission for Gender Equality and relevant Government institutions. The seminar benefited from international experience of e-voting through the participation of electoral practitioners and experts from other countries.

1.1.1 Objectives of the Seminar

The specific objectives of the seminar were to:

- examine the cross-national experience of e-voting technologies by way of country case studies highlighting key lessons learnt;
- afford key electoral stakeholder the opportunity to gain an understanding of e-voting and interrogate its utility in South Africa;
- assess the positions of key electoral stakeholders vis à vis e-voting.
1.2 INAUGURATION

The seminar was inaugurated by the senior leadership of the IEC. Mosotho Moepya, the Chief Electoral Officer, welcomed the delegates and the keynote address was delivered by Advocate Pansy Tlakula, Chairperson of the IEC. Advocate Tlakula expressed appreciation for the participation of all the delegates, particularly mentioning the presence of the Chief Election Commissioner of India, Shri VS Sampath; the Head of the International Foundation for Electoral Systems in the Philippines, Ms Beverly Thakur; Member of the Brazilian National Council of Justice and Member of the Electoral Commission, Judge Paulo Tamburini; Dr Margaret McGaley of the Department of Computer Science at the National University of Maynooth in Ireland, who is also spokesperson for Irish Citizens for Trustworthy E-voting; Peter Wolf from International IDEA and Troy Hector from Telkom.

She highlighted the fact that one of the strategic objectives of the IEC is to ensure that the Commission remains a pre-eminent election management body that seeks continuous improvement and innovation through the use of technology. Further, she stated that the Commission aims to strengthen electoral democracy in South Africa and to position itself as a trend-setter in electoral democracy. The purpose of the seminar was to realise these objectives.

Advocate Tlakula said the IEC has yet to adopt a formal position on e-voting as it is of the view that a thorough examination of the cross-national experience of e-voting is a prerequisite to adopting an informed position. She asserted that although South Africa will review the global experience of e-voting, ultimately the decision whether or not to adopt it should be underpinned by the South African context and be informed by the country’s demographics, political culture, social and economic environment, financial capacity and institutional and infrastructural capabilities.

The March 2013 Kenyan general election had been a classic example of failed technology, she said. About 70% of the biometric data machines did not work on election day and election officials had to revert to the paper registers. Further, the short message service (SMS) facility for transmitting results also failed to work, resulting in a delay in the announcement of the results. Similarly, in Ghana, the use of biometric registration and verification machines during the December 2012 presidential and parliamentary elections did not have desirable results. The law did not provide for alternatives in the event of technology failures.

Advocate Tlakula highlighted some findings from the study of e-voting conducted by the IEC:

- Approximately one in every three countries that may be defined as an electoral democracy has implemented or is experimenting with e-voting;
- E-voting is not the preserve of developed countries – both developed and developing countries are involved. For instance, India and Brazil are considered global leaders in e-voting;
- A few African countries, among them Namibia, Kenya, Ghana, Tanzania and Zambia, are beginning to experiment with the use of technology in various aspects of the electoral process such as voter registration, transmission of results and candidate registration;
- Some countries, among them Holland, Japan, Germany, the United Kingdom (UK) and Ireland, have abandoned e-voting;
- There are many different types of e-voting technologies but, generally speaking, they may be divided into two main categories, namely:
- Technologies that are used in environments controlled by an election management body (EMB). Such technologies include e-voting machines as used in India, the United States of America (USA) and Brazil, among others.
• Technologies that are made available to the electorate in environments that are not controlled by an EMB. Such technologies include internet voting, fax voting and telephone voting. These are available in Canada, France, Estonia, Japan and some parts of the USA.

The study noted that e-voting has both merits and demerits. One of the advantages is that it allows for speedy and accurate counting of votes. It also reduces the number of spoilt ballots. It is considered to be environment friendly in comparison to paper-based voting. The demerits related to high monitoring costs, the security of the data, a reduction in the transparency of the voting process, and the lack of consistent global standards for the verification and auditing of e-voting systems.

From the foregoing chequered lessons learnt, Advocate Tlakula said, there is no discernible reason either to move towards or away from e-voting. Furthermore, while almost all e-voting technologies have been compromised in one way or another, some democracies are prepared to accept them, while others are not. Another lesson is that context is of paramount importance in deciding on an e-voting technology. Finally, research has shown that the process of introducing e-voting is as important as the product itself. The process must be underpinned by inclusivity and trust, while a failure to manage the process of change from one voting method to another is likely to derail the success of the project.

In her concluding remarks before declaring the seminar open Advocate Tlakula outlined the seminar programme, stating that the sessions would benefit from case studies, global experience and the implications of e-voting for South Africa.
CHAPTER 2

OVERVIEW OF E-VOTING – CROSS-NATIONAL EXPERIENCE
E-VOTING: AN ENABLER OR DISABLER TO STRENGTHENING ELECTORAL DEMOCRACY?

2.1 MR SUREN德拉 THAKUR, DURBAN UNIVERSITY OF TECHNOLOGY, SOUTH AFRICA.

Article 21 of the United Nations Declaration of Human Rights, said Surendra Thakur, states that everyone has the right to vote, that votes must be conducted in secret and that the votes must be counted.

Genesis
In his brief history of voting and voting methods he said in Greece in 500 BC the vote was negative and had nothing to do with right or wrong or with justice. In India in 750 AD a huge mud pot (Kudam) served as a ballot box. Voters wrote the name of the desired candidate on a palm leaf (Panaiolai) and drop it into the pot. At the end of the process the leaves (votes) were counted and whoever received the highest number of votes was elected. The Italians used a black or white ball to vote people into secret societies. The white ball meant acceptance and the black ball rejection, hence the term to blackball. Paper ballots were first used in Rome in 139 BC and in the USA in the 17th century. However, in The Gambia in 1965, because the illiteracy rate was 75%, white translucent marbles were used for voting.

Ultimately various machines were introduced, among them mechanical lever, punch card systems, a direct recording electronic (DRE) touch screen, jelly button DRE and optical scans, all of which present challenges.

The next form of voting to be introduced was internet voting, which takes many forms and has been derided by those who oppose it as ‘voting in your pyjamas’. The different forms include:

- Remote internet voting;
- Kiosk-based internet voting; and
- Poll-site-based internet voting.

Electronic Voting

Thakur defined e-voting as encompassing both electronic means of casting a vote and electronic means of counting votes. E-voting may be conducted in either a controlled or an uncontrolled environment. A controlled environment is a secure area the EMB temporarily sets up by installing equipment and implementing a clearly defined process flow. An uncontrolled environment refers to the situation in which a voter accesses a system remotely from the comfort of his or her own locality (home, office or mobile) and registers a vote.

Reasons for Moving to E-voting

The reasons why e-voting was introduced, said Thakur, included: greater accuracy, “faster democracy”, and modernity.

Reasons for not moving to E-voting

Politicians, said Thakur, might object to e-voting because it defers to or ‘constructively’ abrogates their responsibility to their electorate. Among the reasons why others might oppose e-voting were the fact that at some point almost every machine – laboratory, field-based and experimental – has been compromised and that no technology is insulated from misappropriation. In addition, there is the possibility of changing votes surreptitiously. E-voting makes it difficult to monitor voter patterns and it may deny a voter the opportunity to vote by removing her or him from the roll.

Abandonment

Countries that have abandoned e-voting for various reasons include the Netherlands (2007), Ireland (2004), Germany (2009), Australia (2010), England and Scotland. Countries that have used electronic voting machines (EVMs) include India, Brazil, Estonia, Norway, the Philippines, Australia and Venezuela. However, like any other system, EVMs present their own unique challenges.

Socio-political Context

Thakur outlined some of the socio-political factors that should exist in countries that would like to adopt e-voting. These are:

- A stable non-violent political climate;
- A multiparty democracy with two dominant parties;
The IEC is faced with two options: to further explore e-voting through trials and pilots or not to consider e-voting at this stage. A set of recommendations in line with each option is presented below:

**Should the IEC decide to consider e-voting, the following recommendations were made:**

- South Africa should amend its laws to allow for experimentation through trials and pilots to add to the voters’ choice;
- An actuarial analysis should be conducted to assess the benefits that may derive from holding “green elections”. This may help to earn voter trust;
- An expanded, focused research study should be conducted of countries that have abandoned e-voting. It is strongly recommended that countries embarking on trials or pilots be closely monitored;
- An independent, non-partisan monitoring centre must be established where the experiences of e-voting are documented, catalogued, analysed and disseminated. This centre may be virtual, with a specific mandate to constantly appraise and relate to possible South African experience(s); and
- A trial or pilot, if and when conducted, must be transparent, rigorous, inclusive and consultative.
Should the IEC decide not to consider e-voting at this stage the following recommendations were made:

- The various forms of e-voting that are taking place internationally should be continuously assessed and monitored;
- There should be collaboration and partnerships with local and international EMBs, research institutions and those conducting academic studies that analyse and evaluate e-voting technologies;
- Officials should be encouraged to participate in international observer missions in amenable countries where e-voting is practised; and
- Periodic environmental scans or studies, such as this study, of e-voting experiences, should be commissioned.

2.2 QUESTION AND ANSWER

To Adopt E-voting or Not

Mervyn Cirota of the Independent Democrats (ID) and a member of the National Party Liaison Committee asked for the researchers’ views on e-voting and whether they viewed it as an option for South Africa.

André Gaum, of the African National Congress (ANC) and Acting Chairperson of the Portfolio Committee on Home Affairs, asked whether the factors that made other countries discontinue e-voting could be catered for in the South African context. Thakur responded that he believed in the power of technology to help people and to promote equity and generally help communities. He said he supported e-voting and believed it would be useful in the South African context.

Cost

Jana Warffemius of the United Democratic Movement (UDM) enquired about the cost of each ballot cast in South Africa. She also wanted to know why Australia is going back to e-voting. Peter Smith of the Inkatha Freedom Party (IFP) concurred with this line of questioning and sought clarification on the separation of capital costs and operational costs. He questioned the costs provided in the example that had been given: that each ballot would cost more than R10 000. Thakur said it is difficult to work out the costs. He explained that many factors have to be included such as the cost of printing ballot papers, the cost of transporting the papers from the printing works to the voting districts, the cost of the vote on election day and the cost of restoring the ballot papers to the areas where they must be stored for three to five years, and then the cost of that storage. Those had to be balanced against the costs of deploying a typical EVM, which include the grid or energy requirements and the cost of returning the EVM to its storage facility.

Professor Anthony Mbewu, CEO of the South African Government Printing Works, sought clarity on whether research had been conducted around the globe into the use of ID smartcards in conjunction with e-voting mechanisms, either at polling stations or remotely through automated teller machines (ATMs) or any other way that might facilitate ease and security and reduce the cost of e-voting. Thakur said much research has been done on smartcards and there are numerous instances in Western Europe of countries using smartcards for identification. This would be an opportunity in the South African context, he maintained.

E-voting and the Right to Vote

A delegate asked how e-voting relates to the right to vote. Thakur said e-voting would allow for engagement with youth in a way that they are familiar with. Today’s young people, he said, are very connected through the use of smartphones and digital devices, thus the best way to engage with them is through technology. To this effect, Thakur believed that the move to an e-voting system would increase the number of people who vote, particularly in local elections, where, historically, there has been a lower participation rate.
CHAPTER 3

COUNTRY CASE STUDIES
3.1 IRELAND – DR MARGARET MCGALEY, DEPARTMENT OF COMPUTER SCIENCE, NUI MAYNOOTH, IRELAND, AND SPOKESPERSON FOR IRISH CITIZENS FOR TRUSTWORTHY E-VOTING

In a brief political and historical overview of Ireland, Dr McGaley said it is a republic of approximately 4.5-million people, heavily concentrated in the capital city, Dublin. The total area of the state is 70 273 km², a little smaller than the Mpumalanga province of South Africa.

Historical and Political Background

Ireland was under British rule from the 1600s, independence was declared in 1916, and the country was recognised by Britain in 1922. The state that was created covers about four-fifths of the island; the remainder, known as Northern Ireland, remains under British rule. The original 1922 Constitution was replaced in 1937, but many of the political structures are still legacies of British rule.

Ireland’s head of government is the Taoiseach (Prime Minister) and there is a President, who is head of state, but the role is largely ceremonial. The President signs new legislation but has no power to veto it, though the legislation can be referred to the Supreme Court if there is reason to believe it is unconstitutional.

The legislative branch consists of the Dáil (House of Representatives), the Seanad (Senate) and the President. The executive branch is led by the Taoiseach, who must be a sitting member of the Dáil and is nominated by the members of the Dáil. The Taoiseach then selects a cabinet of 7 to 15 members from the Dáil (up to two members may be from the Seanad). Dr McGaley said that although there is local government in Ireland its powers are limited and the local councils rely almost exclusively on funding from the government.

Election Process

Dr McGaley briefly explained the election process in Ireland, where a general election is held at least every five years. Members of the Dáil (TDs) are elected by proportional representation: single transferrable vote. At the time e-voting was piloted there were 43 constituencies, from which 166 TDs were elected. Each constituency has three to five seats, depending on population density. Constituency boundaries are redrawn by an independent commission after each census.

Once the results of a general election are available the political parties negotiate to form a coalition (there has not been a single-party government since 1977). The leader of the largest party in the coalition is normally nominated as Taoiseach. The Seanad consists of members nominated by the Taoiseach, by certain universities, and by special panels. It has the power to delay, but not to veto, legislation.

The government takes advice from Oireachtas committees, which are made up of members of both houses from across the political parties. These committees discuss specific areas of interest and take evidence from interest groups, witnesses and departmental officials, without being constrained by party policy.

Election System

Explaining the proportional representation: single transferrable vote (PR: STV) system, Dr McGaley said that casting a ballot is relatively intuitive: the voter ranks the available candidates in order of preference, writing the number ‘1’ beside their favourite candidate, ‘2’ beside their second preference and so on. ‘X’ or similar marks are also acceptable if the voter only wants to indicate his or her first preference. The counting rules err in favour of reading what one can from a ballot rather than only accepting ballots which adhere strictly to the rules.

A quota is calculated from the number of votes cast and the number of seats available. Dr McGaley emphasised that this number is formulated in such a way that it is impossible for more candidates to reach that quota of votes than there are seats available. Candidates are elected (once they have
the requisite quota of votes) or eliminated (when it becomes clear that they cannot reach the quota).

Counting, she said, becomes much simpler when only one seat is available, for example, the presidency. In such cases the counting becomes equivalent to an alternative vote, since most of the complexity of the system becomes irrelevant. This system is also used to vote for Members of the European Parliament (MEPs).

Ireland does not have an independent electoral commission – state elections are run by the Department of the Environment and Local Government, which was responsible for introducing electronic voting.

Technology Piloted in Ireland

The machines that were piloted in Ireland consisted of a panel of fixed buttons and a small LCD screen which could display very limited messages to the voter. A printed sheet attached to the machine indicated which button represented which candidate or option.

Voters would approach the registration desk and, once their identity and eligibility to vote was confirmed, would be given a token. They would then approach the attendant at the voting machine who would take the token and prime the machine to accept the vote. Once all preferences had been indicated the voter would press the “cast vote” button.

Votes were stored within each voting machine on a “ballot module”. After polls had closed these modules would be physically transported to the counting centre where the ballots were exported to a Microsoft Access database application for tabulation.

History of E-voting in Ireland

Electronic voting, said McGaley, was first proposed in Ireland in the late 1990s and in 1999 legislation was introduced which enabled the use of real ballots in research into the feasibility of e-voting.

Ireland used a system by Nedap/Powervote, which was piloted in three constituencies in early 2002 and seven constituencies in late 2002. The original plan was to acquire 1,400 machines for the 2004 elections and to expand the pilot to the greater Dublin area.

The pilots had been portrayed as very successful but discrepancies were observed between the number of votes recorded by the returning officer and the number of votes recorded by the voting machines in two constituencies. After research and some deliberation, in February 2004 the system was officially launched in Dublin city centre. In March 2004 the Commission on Electronic Voting (CEV) was set up to examine the secrecy and accuracy of the chosen system. More research was done to effect the significant changes the commission felt were required to make the system suitable for use in Ireland. Three years later the minister responsible declared that the government had decided “not to proceed with the implementation of electronic voting in Ireland”.

Reasons for Introducing E-voting

The main reasons for introducing e-voting in Ireland were to:

- Make it easier for the public to vote;
- Provide election results within a few hours after close of poll, depending on the size of constituency;
- Improve the efficiency of electoral administration; and
- Support a positive image of the country in terms of the use of information technology.

Costs

Contrary to early hopes that the system would reduce costs, said Dr McGaley, it was actually quite an expensive way to run an election. While staff numbers at the counting centres would be reduced to very low levels, the number of staff required at the polling stations would be significantly increased.

Storing electronic voting machines create new costs, she said, since computers must be stored in a controlled environment. For the three years before the machines were sold for scrap, the cost of storage was €140,000 per year, reduced from an earlier
figure of €700 000 annually. In addition, a website was developed, at a cost of €52 000, which gave voters an opportunity to practise using the interface through a simulation. Once the decision had been made not to use the system “tens of thousands” of euros were spent on consultants to advise on the disposal or storage of the machines.

Dr McGaley said a detailed calculation of the cost of the system showed that €53 264 335 had been spent and at least a further €57 164 754 could be expected to be spent on staff, storage, and insurance over the projected 20-year lifespan of the machines. This added up to a total spend of €110 429 089 and, calculating on the basis of one election every two years, each election would cost more than €11-million.

Reasons for not Implementing E-voting Technologies in Ireland

- The quality and testing of the count software: the software had a mission critical role in a safety context, yet it had no coherent version control system so changes were constantly being made;
- Access to source code: the source code for both the voting machines and the count software was not made available to the Commission, which was therefore unable to perform an adequate code review;
- Incomplete testing: the CEV was concerned that there had been inadequate testing of the system and there were no independent end-to-end tests of the system as a whole;
- The security of the personal computers (PCs) used at counting centres – the so-called hardened PCs – were deemed to be the weakest link in the security of the system;
- Procedural issues: the report simply states that “attention is required” for this aspect of the system, but this is consistent with reports from the returning officer in the pilots;
- Secrecy of the ballot and special needs: the system failed to improve accessibility for voters who normally need assistance with voting, and even reduced accessibility;
- Difficulty of publishing votes: there is a conflict between the desirability of publishing all votes for verification of results and the potential use of unlikely vote combinations as a signal in cases of corruption or intimidation;
- The system did not have a voter-verifiable audit trail, thus it:
  - Could not reassure voters that their vote had been correctly recorded;
  - Created a disincentive to the manipulation of the system by providing an external check on accuracy; and
  - Enabled recovery from a serious system failure.

Lessons Learnt

E-voting, said Dr McGaley, has the potential to bring some improvements to the electoral process, but it must be introduced carefully and with full cognisance of the safety critical to the nature of the electoral system. Impartial, reliable, informed expertise is vital to the successful introduction of e-voting. Several significant mistakes were made in Ireland that contributed to the failure of e-voting there. Below are some of the lessons that were learnt:

- Response to criticism: the response from the government was to demonise people who opposed the system and to dig in its heels;
- Expertise: the DoELG did not have sufficient in-house expertise to evaluate the quality of the system and ended up relying on the vendor’s advice;
- Specifications: a clear set of requirements was never developed;
- Planning: inadequate planning resulted in several oversights (including the purchase of insufficient machines);
- Buy-in: the project did not have buy-in from all stakeholders;
- Responsibilities: the contracts with the vendors of the system appear to have been wholly inadequate. They had no legal responsibility to provide a system that was fit for purpose.
Dr McGaley concluded her presentation by reiterating that a project of this scale and importance must be well-specified, well-planned and supported by impartial advice from sufficiently knowledgeable experts. Above all, it must be undertaken with caution.

3.1.1 Question and Answer

Cost Analysis of E-voting

Mervyn Cirota of the ID said economies of scale seem to be important when deciding whether or not to use e-voting. Ireland, he said, had only a small population and there is a need to determine whether South Africa’s population, which is 10 times the size of Ireland’s, would provide an ideal setting for e-voting systems. He sought advice as to whether e-voting would be recommended or if it would be too complicated a system for significantly large populations. Dr McGaley said it is hard to draw conclusions about economies of scale. She noted that although many people believe the machines save money this conclusion is not necessarily justified.

Red Haines of Bharat Electronics asked about the cost of the machines used in Ireland and how many were purchased. Dr McGaley said the machines cost about €3,500 each and 7,000 machines had been purchased but that number had proved to be inadequate. She argued that for a small population like that of Ireland e-voting might not be cost-effective. A cost-benefit analysis is required before making a decision to use this system.

Cirota asked about the fundamental reasons why the system of e-voting had failed. He queried whether if it were introduced in South Africa the results might be different. Dr McGaley said she believed that because the system in Ireland was not run by an independent electoral commission there had been no particular control, no analysis of the system and many questions had been left unanswered. While she did not believe there had been corruption, the system had failed because of various incidences of incompetence.

Penny Tainton of the Democratic Alliance (DA), an IT professional, asked for an assessment of the concept of e-voting and whether it could be further investigated, supported and implemented better. Dr McGaley said she had very high standards when it came to EVMs. She would not underestimate the value of e-voting but, if there were a more cost-effective system of voting, she would use it. There were many advantages to e-voting, particularly in countries such as India and Brazil, which have large populations. Her personal preference, she said, is scanned ballots, because they provide a voter-verified audit trail, but she reiterated that she was not opposed to e-voting.

How the Lessons Learnt Can Be Used to Upgrade the System

Raymond Tlaeli of the African Christian Democratic Party (ACDP) sought clarity as to whether the e-voting process was abandoned or aborted because Dr McGaley, together with the International Conference on Technology and Education (ICTE), had set up a group that had campaigned successfully against the system. He further asked whether it was possible that the government would review the lessons learnt and re-apply the system more appropriately. In response, Dr McGaley said the Commission on E-voting and Counting at Elections had outlined the changes it thought were needed to make the system trustworthy. The changes were extensive and it was clear that they would cost a great deal and there was no political will to pursue the project. Further, people like the paper system.

A representative from Nigeria asked whether any other options or technologies had been considered or if the decision had been made based only on one system. Graham McIntosh, Member of Parliament on the Portfolio Committee on Home Affairs, asked whether, if PRSTV was not the stumbling block, the Irish government would consider using a different e-voting system. Dr McGaley replied that the government and the people had over-committed to the system that had been used and the idea of getting a new system was not welcomed. In addition, the way the system had been introduced was inappropriate as there had been no independent tender process. There had also never been a broad analysis or trials of different systems. The Irish
people, she said, are attached to the PRSTV system. Three attempts have been made to replace it but they have failed to convince the electorate.

Another speaker said the most important aspect of the presentation had been the indications of what South Africa might learn from the Irish situation to assist in its own voting process. Dr McGaley said South Africa faced many challenges in relation to e-voting. These include infrastructure, the multiparty system and the topography of the country. She said that in planning the way forward South Africa must consider pilot projects, as e-voting is very costly. She believed the IEC should take a cautious, appropriate approach, trying different technologies based on an analysis of its various contexts. She advised the IEC to begin with EVM trials that are not binding.

Moreover, different technologies should be tried and tested.

3.2 INDIA – SHRI VS SAMPATH, CHIEF ELECTION COMMISSIONER OF INDIA

Demographics of India

India has a population of approximately 1.21-billion and an electorate of over 770-million – greater than that of all the countries of Europe combined. There are 543 parliamentary constituencies, 4 120 assembly constituencies and approximately 900 000 polling stations. More than 8 000 candidates contested the 2009 parliamentary elections and approximately 11-million polling personnel and 100 000 personnel from the central police force were deployed in those elections.

Population and electorate in India compared to the rest of the world (Source: Election Commission of India)

Major Challenges in Elections in India

Sampath said major complexities and diversities make Indian elections challenging and exciting. The country is topographically diverse, incorporating a desert, islands, dense forests and lush green fields. The Indian Constitution recognises 22 languages, however, there are also hundreds of minor languages and dialects.

While elections are conducted on a large scale, he said, the Election Commission of India (ECI) also has an eye for detail in ensuring that every single voter is able to cast her or his vote freely and fairly. An example is that a separate polling station was created in the middle of the Gir National Forest in Gujarat for a single voter so the voter did not have to walk far to cast his vote. The Commission, said Sampath, tracks every polling station on election
CHAPTER 3

COUNTRY CASE STUDIES

day, using mechanisms like SMS-based poll monitoring, video recordings of the polling process and direct web casting from polling stations.

India’s voting system has evolved in the past 60 years from a very primitive system to electronic voting. In the first general elections, held in 1951, a separate ballot box was kept for each candidate as voters would not have been able to understand the process of marking ballot papers. The system of marked ballot papers was introduced during the mid-term elections to the legislative assemblies of Kerala and Orissa in 1960-1961 and remained in vogue until the elections for the Lok Sabha in 1999.

Types of E-voting

Sampath described two types of e-voting: ‘place of poll electronic voting’ and ‘internet voting’. Internet voting has been tried on a limited scale in Austria, Canada and the USA and India experimented with it in elections for the Ahmedabad Municipal Corporation in Gujarat. ‘Place of poll Electronic Voting’ can mean the use of ‘direct recording machines’ or voting by marking on a paper ballot in the usual manner, with optical scanning for the counting process.

The Journey of Indian EVMs

EVM technology was first mooted in 1977 by Shri S L Shakdhar, then Chief Election Commissioner of India. Two public sector companies, the Electronic Corporation of India (ECIL) and Bharat Electronics Limited (BEL), were asked to develop EVMs.

The machines were extensively tested at locations across the country and the EC conducted seminars with all stakeholders. The machines were then fine-tuned based on the feedback obtained. The decision to use EVMs, said Sampath, was made in July 1981, but they were first used in May 1982 at 50 polling stations in the Parur Assembly Constituency in Kerala. Before the use of these machines could become widespread, however, it was challenged in an election petition and, in 1984, the Supreme Court ruled that EVMs could not be used in elections unless the law was amended and a specific provision made for their use.

After deliberation the government appointed a Technical Experts Committee to examine EVMs and give a report to the Committee on Electoral Reforms. The Technical Experts Committee unanimously recommended that EVMs should be used and, on the recommendations of the Committee on Electoral Reforms, Parliament amended the law in 1988, adding a new section empowering the Commission to use EVMs. The necessary amendments were made to the Conduct of Election Rules in March 1992 and, since 1999 EVMs have been used in every general election and by-election in India.

Main Technical Concerns and Remedies

One of the main concerns raised when EVMs were being developed, said Shri Sampath, was the possibility that data might be tampered with. The remedy was to “burn” a software code into the microprocessor used in the EVM which cannot be changed or even read back from the microprocessor.

In addition, Indian EVMs do not have an operating system, all coding is at the chip level and the EVMs are stand-alone machines which cannot be networked and therefore cannot be accessed or hacked remotely.

Another problem was how the machines could be used in rural areas which had no mains power. The remedy was to use a special power pack, a 7.7-volt battery which is independent of mains power. In these cases, because it is necessary for data to be stored for long enough to be used as evidence in a court of law in case of an electoral dispute, data is recorded on volatile dual redundant memory chips so it can be retained for years even when the power pack battery is removed.

Improvements in EVMs over Time

India’s EVMs, said Sampath, have been improved as technology has progressed. The first model, manufactured in 1989/1990, has been declared obsolete. The Commission has fixed the life of EVMs at 15 years. A new improved model, designed in the 2006, includes date and time stamping of all keys pressed, dynamic key coding, and a real-time clock.
Security of EVMs

EVMs, said Sampath, are kept under strict security – stored in lockable rooms under armed guard 24 hours a day. They are also under CCTV camera surveillance. When they are transported from the storage area to the polling stations and back they are always accompanied by an armed police guard.

Transparency and Involvement of Stakeholders

The Commission, said Sampath, ensures complete transparency and involvement of all stakeholders in the use of EVMs. A first-level check is done a few months before every election in the presence of representatives of recognised political parties, after which a mock poll is conducted by casting 1,000 votes in at least 5% of EVMs picked randomly by representatives of political parties. A sequential printout of the result is made and shown to the political party representatives. Thereafter, the control unit of the EVMs is sealed using a uniquely numbered pink paper seal which is manufactured by the security printing press, Nasik.

Sampath emphasised that the control unit cannot be opened without damaging the pink paper seal. After the candidates for election are finalised a similar process of second-level check is done on the ballot unit, after which the unit is sealed using the pink paper seal.

Judicial Scrutiny of EVMs in India

EVMs in India are scrutinised by the courts and satisfaction has been expressed in election petitions about the fact that they cannot be tampered with, said Sampath, with one court observing that “this [ECI-EVM] invention is undoubtedly a great achievement in electronic and computer technology and a national pride”.

The Madras High Court held that “there is also no question of introducing any virus or bugs”. It further observed: “The contention of the learned counsel is that the use of EVMs in Japan and the United States of America proved to be a failure also will not hold any water. In India, we are not following the system prevailing in the United States of America or Japan.”

Advantages of Using EVMs

According to Shri Sampath the advantages of using EVMS are:

- They modernise the election process;
- They are user-friendly and can be used by illiterate voters;
- They are simple to operate and can be installed in a short time;
- They preserve voting secrecy;
- There is no scope for invalid votes;
- They facilitate quick and accurate counting and make it possible to declare results instantaneously;
- They are re-usable by simply erasing votes recorded in an earlier poll;
- The huge expenditure involved in printing, storing, transporting and securing ballot papers is avoided. Approximately 12,000-million tons (MT) of paper would be needed at a total cost of Rs. 578,400,000 in each parliamentary election;
- Operating costs are low;
- EVMs are easy to manage, with less demand on manpower;
- They are environmentally friendly. One MT of paper requires that 24 fully grown trees be felled, so there is a saving of 282,240 trees in every election by using EVMs. One MT of paper needs 680 litres of water, so 8,160,000 litres of water are saved in every election.

Way Forward

The ECI, said Sampath, is continuously engaged in the process of further improvement of EVMs. BEL and ECIL have already developed a voter verifiable paper audit trail (VVPAT) system, the design of which has been approved by the Technical Experts Committee. The Commission has now decided to use EVMs with VVPAT in a by-election before they can be used more widely. The Commission is also working on a new EVM model and is considering the following additional features:

- Code verification and unit authentication;
- Public key infrastructure (PKI) authentication;
CHAPTER 3

COUNTRY CASE STUDIES

- Possibility of code in public domain;
- Integrated VVPAT;
- Confirmation of choice of vote by the voter;
- Possibility of a larger number of candidates.

Lessons Learnt
- E-voting and counting makes election processes faster, simpler and tamper-proof;
- Provision must be made in election law before EVMs are used;
- E-voting should be introduced gradually;
- Consultation with all stakeholders is a must to ensure buy-in;
- Voter education in the use of EVMs is desirable to ensure a well informed and better engaged populace;
- Continuous improvement is necessary with changing technology.

3.2.1 Question and Answer

Shortcomings of the EVMs
Jacob Dikobo of the Azanian People’s Organization (AZAPO) sought clarity on the disadvantages of e-voting as he believed no system could only have advantages and no demerits. Another speaker concurred with Dikobo and, noting that the system had been portrayed as perfect, asked whether India had experienced any practical problems since it began using the technology and what the challenges were. Sampath explained that the system has its disadvantages, such as instances where machines fail, and recommended that an adequate number of machines should be provided. In remote areas it takes longer to replace machines, so India has had to come up with strategies to ensure that machines remain accessible to people living in these remote areas.

Another perceived disadvantage, he said, is the source code. This should be in the public domain or there should be source code verification. India was examining whether when new voting machines are acquired source codes will be able to be verified and placed in the public domain. Another disadvantage of the EVMs is that, in a minuscule percentage of cases, the machines do not reflect the vote count correctly. In such cases provision is made to attach a printer to the machine and have the results printed. If the margin between the winning and losing candidates is greater than the total number of votes covered by the EVM where the result is not obtainable, the returning officer is permitted to declare the results.

The IEC’s Advocate Pansy Tlakula asked why India has decided to experiment with a paper trail system. Sampath said political parties had requested that the paper trail be introduced as a further confidence measure. EVMs are not manipulable, he maintained, and no one has been able to show that they can be manipulated.

Cost Analysis
A representative from Nigeria asked for a comparison of the expenditure on the old voting system and that on e-voting. Sampath said no research to that effect had been done but, on average, India spends less than half a dollar per voter. India does not recruit personnel to conduct elections, instead using government employees who are deputised to the ECI so that no extra cost is incurred. The figures he provided are only the savings made by the absence of paper.

Security of EVMs
Peter Wolf of International IDEA sought clarity on the security of the EVM voting system. He enquired whether political parties are concerned about the fact that votes can be linked to individual voters. He further enquired whether any thought had been given to randomising the storage of the machines so that there is no link between the voter and the vote cast. Sampath responded that e-voting has, to an extent, reduced some malpractices, including mischief at polling stations. The results obtained should be considered an improvement to that extent. Asked by Dr Sylvester Maphosa of the Africa Institute of South Africa, whether e-voting aids in consolidating negative peace, that is, the
absence of direct violence, or in creating positive peace in terms of transforming attitudes and relationships and the capacity and competence of the leadership, Sampath said he was not sure.

3.3 PHILIPPINES – MS BEVERLY THAKUR, HEAD OF THE INTERNATIONAL FOUNDATION FOR ELECTORAL SYSTEMS IN THE PHILIPPINES

Demographics and General Background

The general population of the Philippines in 2010 was 92.3-million and the voting population 48 275 594. In 2013, however, said Ms Thakur, those figures were expected to rise to 103-million and 52 014 648 respectively.

Local government units (LGUs), she said, are divided into 80 provinces as the primary unit. Provinces are composed of cities and municipalities, which, in turn, are composed of “barangays” or villages (which are the smallest LGUs). The Philippine government consists of the executive, the legislature and the judiciary and it is the judiciary that has the mandate to oversee elections. The Philippines has a Bicameral Congress consisting of a Senate and a House of Representatives.

Thakur described Filipino voters as showing much resilience and a commitment to democracy, as evidenced by the substantial voter interest and turnout in 2007 under the manual system and in the first automated election, in 2010, when voters had to brave long queues to cast their ballots.

The social context of the Philippines has strong underpinnings of corruption and self-enrichment, leading to election violence by both losing and winning candidates.

The E-voting Technology

The Philippines’ journey to e-voting technology began in 1995 with the enactment of the enabling law. In 1996 the first automated election was held. In 1997 Congress enacted another law to automate elections in 1998 and thereafter.

There were, however, some delays. In May 2001 the authority to automate elections was in place but there was no budget and in 2004 the Supreme Court declared related procurement null and void.

By 2008 five pilots had been implemented to test different technologies and these pilots informed the decision about which technology to use.

The International Foundation for Electoral System (IFES) held a vendor fair in November 2008 to introduce the Filipino electorate to e-voting technologies. The fair exposed the stakeholders to the technological options and information about potential pitfalls. The outcome was a recommendation that paper-based precinct count optical scan (PCOS) technology be used for the May 2010 presidential election. In 2009 Congress enacted a law that assigned the equivalent of R2.1-billion to the e-voting technology project.

Type of Technology

In 2009 the contract for an automated election system was awarded to Smartmatic-TIM for the 2010 elections. The contract provided for three components:

- An automated election system comprising an Election Management System, PCOS System, and Canvassing and Consolidation System (CCS);
- The electronic transmission of election results;
- Overall project management.

About 82 000 PCOS machines were leased, requiring precincts to be clustered and increasing
the maximum number of voters per precinct from 200 to 1 000. Thakur argued that it is better to obtain machines based on the needs of the electoral system than to fine-tune the operations according to the number of machines that can be obtained.

**Introduction of E-voting Technologies in Philippines**

According to the law the objectives of the migration to the e-voting system are to improve the secrecy and sanctity of the ballot and all election, consolidation and transmission documents in order to make the process transparent and credible and for the results to be fast and accurate and reflect the genuine will of the people. Although e-voting technology does not improve the secrecy of the ballot, said Thakur, it does have a positive impact on accuracy.

She argued that the manual system left room for manipulation as well as for honest mistakes. With the electronic system the results are transmitted to a central server and an additional server used by parties, civil society and the media.

Thakur admitted, however, that e-voting made the vote count less transparent as the results are tallied by a machine, while, under the manual system, voters would gather to see the counting and tallying of results.

**Monetary Costs of E-voting and Counting**

About 70% of the costs were allocated to the leasing of the machines, while about 20% went to the services of the vendor, said Thakur, saying that the question of whether e-voting technologies are worth the costs are best answered contextually in terms of need versus cost.

**Transitional Issues: From Traditional Voting Methods to E-voting/Counting Technologies**

Some important issues to watch out for in migrating from manual ballot to electronic technology, said Thakur, are the inclusiveness of external stakeholders; patience, perseverance and pilot testing; management and communications within the election management body; capacity-building and change management; quality control and risk management and new skill sets in IT at all levels. There is also a need for random manual audits and the management of winning presidential margins.

**Key Lessons Learnt**

Most of the problems picked up in the e-voting process, said Thakur, were linked to human error rather than to the machines. Thus it is essential to educate voters in the use of new e-voting or counting technologies.

She also noted that although the review of source code was delayed, it was thorough. While a significant number of “minor” deficiencies were detected, such issues could be reconciled with “appropriate manual processes”. It was recommended that a proper random manual audit be conducted to provide the required security.

The number of printers required had been miscalculated, which led to the ultraviolet (UV) ink not printing properly. This meant that the UV ink reader security level had to be turned off, sacrificing an important ballot security feature.

In addition, an open console port posed a major security problem. Also, the compact flash cards were not read due to late ballot design modification.

**The Future of E-voting in the Philippines**

A survey revealed that about 75% of Filipinos were satisfied with the general conduct of the May 2010 automated elections as there was a higher percentage of poll workers than there had been before. The survey also found that Filipinos were satisfied with the way the elections were conducted.

**Future Gaps**

There is a need to increase transparency in the preparations for the next automated electoral exercise. Institutional capacity-building for the election management body is also necessary. There may also be a need to invest in new machines for the 2016 elections.
Key Points when Deciding on E-voting

- Define a core need for targeted implementation of technology;
- Provide for a legal framework, budget, time and political will;
- Ensure clean and transparent procurement processes;
- Conduct pilot testing, hold vendor fairs and have a strong public relations and media strategy;
- Prioritise voter education and poll worker training;
- Invest in capacity building for all election stakeholders, including election management body staff, civil society, judiciary, media, and security agencies;
- Adjust for new timelines as major changes may be required for the previous processes;
- Design plans to mitigate unintended consequences of automation;
- Implement a timely random manual audit on election night.

In her concluding remarks Thakur advised that the IEC’s values should underpin the electoral process the IEC selects. These values should be the IEC’s guiding principles whether under a manual or electronic system.

3.3.1 Question and Answer

Level of Inclusivity

Ntokozo Ngidi of the Electoral Institute for Sustainable Democracy in Africa asked about the level of inclusivity of stakeholders in the Philippines, seeking clarity as to whether the responsibility of including stakeholders rested only with the election authority.

Thakur said the level of inclusivity had definitely increased since the introduction of the automated system. She stated that there has been collaboration in the formation of inter-agency technical working groups. Among the aspects considered by the stakeholders were the special needs of the disabled and of indigenous peoples, to increase their participation in elections. Through this inclusivity the election process brought greater transparency.

Adjudication Procedures

Thakur emphasised the need to set election adjudication procedures well before the elections. In the Philippines, the adjudication processes were not set prior to the elections and this caused numerous problems with the verification of votes.

Benefits of E-voting for Ordinary Citizens

The question was raised of what benefits ordinary citizens derive from the introduction of the e-voting process since the clustering of precincts may mean voters must travel longer distances.

Thakur said clustering had indeed meant some voters had to travel further and had resulted in longer voting queues. Further, clustering precincts made it easier for ‘flying voters’ to carry out fraudulent activities.

Voter Turnout

Asked about the impact of the e-voting system on voter turnout, Thakur said the turnout was estimated to have been the same as it was before the introduction of the automated voting system. She attributed this to the optimistic nature of Filipinos. She also argued that voters are more likely to trust a system that they believe has less human involvement.

Benefits of the Automated Voting System

Thakur said the major benefit of the e-voting system was the economic stability it brought to the country as a result of a credible election process. In the past election fraud had led to a lack of trust in government and hence to economic instability.

Impact of E-voting on Violence

Asked whether she believed there was a relationship between the e-voting system and the reduction in election violence, Thakur said there is an opportunity for electoral systems to minimise conflict and consensus-building is more of a
decision-making process than a conflictual, winner-takes-all system. She argued, however, that with the introduction of the automated voting system the risk of violence increased and said that there is need to agree on a definition of what constitutes election violence and to monitor it closely.

Delegates also sought clarification as to whether Thakur believed the system of e-voting used in the Philippines would be suitable for South Africa.

Enhancing Democracy
As asked whether e-voting had enhanced democracy in the Philippines, Thakur said democracy had prevailed in the 2012 elections but pointed out that whether elections are manual or electronic, a number of aspects can derail the process.

Unintended Consequences of E-voting
Delegates asked what measures the Philippines was taking to mitigate the unintended consequences of e-voting. Thakur said technology could always be compromised and manipulated, so success depended on the local context, on what people choose to trust as well as the security levels that can be put in place to give people a certain level of comfort.

However, she noted that it is always difficult to guard against unintended consequences because nobody knows what they might be. She said the election management body in the Philippines had included a risk management team within the project management team to mitigate some of the unintended consequences.

Transparency
As asked to elaborate on the fact that transparency had been compromised by the e-voting system, Thakur said she did not believe that the automated voting system in the Philippines had necessarily affected transparency, stating that although there were some challenges the electorate also enjoyed a level of security.

Human Resources
Thakur said there is a need to restructure human resources as the manual election make-up may not be suitable for the demands of an automated voting system.

3.4 BRAZIL – JUDGE PAULO TAMBURINI, MEMBER OF THE BRAZILIAN NATIONAL COUNCIL OF JUSTICE AND MEMBER OF THE ELECTORAL COMMISSION

Background
Brazil is a large country, almost two-thirds the size of Africa, with some areas only reachable by helicopter. The country has four time zones, which is a challenge when delivering an election.

Electoral System
The Brazilian electoral justice system is not delivered by an electoral management body but by the electoral court. Elections in Brazil are thus conducted by judges who plan, execute, organise and evaluate the elections. The election system includes a press centre where election officers, the media and police, among others, are trained.

Other important stakeholders are the armed forces, the National Agency of Telecommunications, the National Agency of Electricity, the State Secretaries of Public Security and the Federal Audit Court.

Brazil is a federal state divided into 27 member states with regional electoral courts. It has an estimated 140-million voters, 5 568 municipalities, 3 033 electoral zones, 96 116 polling stations and 437 443 precincts. The country holds elections every two years, leaving only a short turnaround time. The cost of delivering en election is a little over $USD395-million – at least $USD2.81 per voter.

In 2012 there were about half a million election candidates and about 10 000 legal cases were brought relating to the elections. Data has shown that the number of cases has decreased since the introduction of the e-voting system.
Overview of the 2012 Elections
In his overview of the 2012 elections Judge Tamburini said only 0.5% of the machines had been replaced. There was a high rate of absenteeism, though in the states in which there is a full biometric identification system, the absentee rate was only 5%.

The E-voting Machine
One of the strengths of the machines, Judge Tamburini said, is that they have been tested over time. He believed that any credible research into e-voting must include the Brazilian experience since Brazil is one of the largest and oldest electronic democracies in the world.

Judge Tamburini attributed the success of the system in Brazil mainly to the make of the machine, which, he argued, was designed to be simple and suitable for Brazil, which has a high illiteracy rate. Another reason for this success was that the system incorporated aspects of the telephone and the ATM, with which Brazilians were already familiar. Because of its simple design the voters have become so comfortable with the machine that almost 100% of them were not in favour of a more modern design.

Costs
The e-voting machines cost about USD$600 each, said Judge Tamburini.

3.4.1 Question and Answer
Shortcomings
While Judge Tamburini acknowledged that there was need to improve technology continuously by making it safer, more transparent and trustworthy and offer citizens the opportunity to maintain the secrecy of their vote and vote in peace, he said that research conducted in 2012 showed that the system, which had been operating for more than 20 years, was trusted by about 97% of the people, which is one of its most valuable assets. The ordinary justice system, manned by the same judges, is only trusted by 64%.

The machines are publically audited in full view of the media and attorney generals, among others. The Judge emphasised the importance of partnering with the people in order to gain their trust and confidence.

Reduction in Legal Cases
The reason for the reduction in legal cases after the introduction of the e-voting system, Judge Tamburini said, could be attributed to the passage of a law providing that no person who was facing prosecution could stand as candidate – the legislation was instituted at the behest of the people and was adopted by Parliament and confirmed by the Supreme Court.

Transfer of Skills
Another reason for the reduction in the number of court cases, said the Judge, was that people were taught to learn as much as they could about the candidates.

Responding to question about the possibility of international cooperation in developing e-voting machines and the transfer of skills between countries, Judge Tamburini said cooperation was indeed possible and that his duty was not to teach but to share the experience of e-voting. His country, he said, had developed a Brazilian solution to a Brazilian problem within the confines of the country's human and technological resources and its infrastructure, thus Brazil does not depend on any other country for the technology.

Brazil, he said, is prepared to provide information about the successes and shortcomings of its e-voting system so that other democracies contemplating adopting the technology need not reinvent the wheel.
CHAPTER 4

KEY LESSONS LEARNED FROM THE INTERNATIONAL EXPERIENCE
4.1 MR PETER WOLF, INTERNATIONAL IDEA, LEAD AUTHOR OF *INTRODUCING ELECTRONIC VOTING: ESSENTIAL CONSIDERATIONS*

Peter Wolf began his presentation by playing a humorous video made following the recent US presidential election. The clip was from the popular cartoon, The Simpsons, and shows the character Homer Simpson trying to cast his vote electronically for Barack Obama, but the e-voting machine continually records his vote for Mitt Romney. This by way of reminding the audience that there is always the possibility of problems with e-voting technology.

Wolf outlined the different types of e-voting, namely the use of voting machines and internet voting. The differences between machine and internet voting are reflected in the table below:

<table>
<thead>
<tr>
<th>VOTING MACHINES</th>
<th>INTERNET VOTING</th>
</tr>
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<tbody>
<tr>
<td>• The environment is <strong>controlled</strong> – the election administration can have a high level of control over the equipment that is used.</td>
<td>• <strong>Uncontrolled</strong> environment – people can vote from anywhere the internet is available.</td>
</tr>
<tr>
<td>• The election administration has an opportunity to control how the voters are actually casting their vote, and whether they are doing so in secrecy.</td>
<td>• Nobody can really make any assumption about the computer that the voter uses for casting a vote.</td>
</tr>
<tr>
<td>• <strong>Only one voting channel</strong> – once a certain polling station has switched to e-voting people no longer have the choice of going back to paper, they must use the electronic equipment available at the polling station.</td>
<td>• <strong>Additional voting channel</strong> – Internet voting, on the other hand, is usually introduced as an additional voting channel. People can choose either to vote online electronically in the weeks before an election or they can go in person to a polling station and cast a regular vote.</td>
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**Types of Voting Machines**

There are “a lot of quite exotic solutions”, said Wolf, but globally the most common technologies are ballot counting machines and direct recording electronic (DRE) equipment.

**Ballot Counting**

Ballot counting is based on machine-readable paper ballots. Voters shade them in a specific way and feed them into a ballot scanner which captures the ballot, interprets the vote and is then able at the end of the election day to produce the results for that polling station instantaneously. The advantage of this system is that it bridges the gap between traditional paper-based voting and e-voting and adds some of the advantages of e-voting. In addition, a quick count can be implemented. The disadvantages of the system are that the logistics for the election have to be doubled and the paper process cannot be eliminated, so paper ballots still have to be produced and shipped. The paper ballots must also comply with far more stringent specifications because they must be machine-readable. In addition to the entire paper process the voting machines themselves have to be deployed.

**TYPES OF E-VOTING SYSTEMS**

**Direct Recording Electronic (DRE)**

With DRE equipment people make their choice on a touch screen and the device records it directly onto a computer and can produce a result at the end of the election day. The advantage of this system is that the interface is user friendly, it is possible to cover multiple languages and complex ballots can be presented better on multiple screens, while there are also audio interfaces for sight-impaired voters. The disadvantage of the system is that it does not produce any physical evidence of the votes.

**Optical Mark Recognition (OMR)**

OMR systems are based on scanners that can recognise the voter’s choice on special, machine-readable ballot papers. OMR systems can either be central count systems, where ballot papers are
scanned and counted in special counting centres, or PCOS systems, where scanning and counting takes place in the polling station as voters feed their ballot paper into the voting machine.

**Electronic Ballot Printers**

Electronic ballot printers are similar to DRE machines, producing a machine-readable paper or electronic token containing the voter’s choice. This token is fed into a separate ballot scanner, which does the automatic vote count.

**Internet Voting Systems**

In this system votes are transferred via the internet to a central counting server. Votes can be cast either from public computers or from voting kiosks in polling stations, or, more commonly, from any internet-connected computer.

**E-VOTING SYSTEM OPTIONS**

**Access to Source Codes**

Wolf defined access to source codes as the instructions that determine how a computer system, including all the voting machines, is working. Anybody with the right level of expertise can establish, by looking at the source codes, the quality with which the machine has been built, how secure it is and its potential weaknesses. When it comes to e-voting, he said, people want clarity about the possibility of stakeholders having access to source codes. Most commercial companies are extremely reluctant to provide access to those source codes as they are viewed as intellectual property and might infringe the security of votes. However, over the years there have been other solutions, though in limited forms, to give people access to the information. This is sometimes done by holding a demonstration in a laboratory where interested stakeholders are invited by the vendor, who explains how the system operates.

**Voter Authentication – Electronic Poll Books**

An internet voting system, said Wolf, requires a voter to sit in front of a computer to verify that he or she is eligible before he or she can vote. Only one valid vote can be cast. For e-voting in polling stations this is more easily achieved with paper-based voter registration as a first step and e-voting as the next step.

**Examples of Major E-voting Experiences**

E-voting is being used or has been used in:

- Estonia, the most advanced country in the field and which has dramatically increased participation in e-voting over the years. A quarter of Estonia’s population votes online;
- The USA, Brazil, Venezuela, India and the Philippines – probably the biggest countries to use e-voting systems;
- Europe, where there are a few small-scale implementations;
- France – in few municipalities;
- About half of Belgium;
- The Netherlands, which used e-voting machines similar to those in Ireland for about 20 years, but stopped a few years ago;
- Germany, where the system was declared unconstitutional because one of the constitutional requirements for elections is that they must be public and the Constitutional Court deemed an election where participants cannot watch how the votes are counted not to be considered a public election;
- Austria, which instituted internet voting pilot projects in student council elections. Initially it seemed that all political parties supporting internet voting, but, during the process, some concerns were raised and some of the parties became more critical of the technology. In the end the system gained very few users.

**Potential Benefits of E-voting**

According to Wolf these are:

- Faster availability of results;
- Elimination of human error and related inaccuracies;
- Elimination of some types of fraud;
• Confirmation of vote or invalid vote warnings;
• Improved accessibility;
• Increased convenience for voters; and
• Better service for most citizens.

Why the System is Controversial
E-voting is controversial, said Wolf because it does away with the most central rituals of an electoral process, reduces human control and transparency enormously throughout the process, and places system knowledge in the hands of a few.

Challenges of the System
The challenges of e-voting are that it is the most complex of the electoral technology upgrades as it touches the core of the electoral process. It is an opportunity to solve some old electoral problems but also creates new ones, many of which are not of a technical nature.

Recommendations
Wolf made the following recommendations:
• Define clearly the goals of the implementation of e-voting. These goals should be focused on improving the electoral process in some way. Only with these goals in mind will EMBs be able to establish whether e-voting is the solution they are looking for within their context.
• Be aware of the challenges. No e-voting system is perfect, and there is no standard system in use in any given country.
• Get the buy-in of key stakeholders. It will be near impossible to implement e-voting against the will of a significant number of stakeholders in a country.
• Provide for auditing and certification – these aspects are very important to the establishment of trust and transparency.
• Allow enough time for technical implementation and social acceptance.
• Plan for training, professional development and civic education.
• Calculate the real costs of ownership, not just the once-off purchase costs.
• E-voting will not make up for a lack of trust. If there is a problem with the trustworthiness of the existing electoral process the issues are likely to be magnified rather than diminished by the introduction of e-voting.

4.1.2 Question and Answer
Manny de Freitas, a member of Parliament, expressed his concern about the lack of transparency of e-voting systems and the fact that they are left in the hands of only a few people, thus reinforcing a lack of confidence in an electoral system. He maintained that there would be new problems associated with e-voting and suggested that before e-voting is considered, the IEC might, through electronic means, create statistics and reports from results that have been created and developed during various elections.

Asked by Reuben Baatjies, of the South African Local Government Association (SALGA), whether e-voting could make up for a lack of trust in an electoral system, Wolf said he did not believe so. Many European countries saw no reason to move to an e-voting system and indications were that they felt that internet voting was a more exciting opportunity for the future.

Red Haines of Bharti Electronics, convinced of the benefits of e-voting over a manual system, said he believed there was no need to reinvent the wheel, as evidenced by the fact that Brazil and India have been using the system successfully for a number of years. He emphasised how much paper was used every year in South Africa to print ballot papers. All costs related to paper and printing could be channelled towards the capital costs of the equipment, he said. Haines also believed that e-voting would contribute positively to the environmental campaign, a view with which Wolf agreed.
CHAPTER 5

ICT & TELECOMS INFRASTRUCTURE
5.1 INFRASTRUCTURE REQUIRED TO SUPPORT E-VOTING AND COUNTING: MR TROY HECTOR, ACTING MANAGING EXECUTIVE: GOVERNMENT BUSINESS SERVICES AND LARGE BUSINESS SERVICES, TELKOM

Information and communication technology (ICT) is vital in any election as it runs in the background and determines the success or the failure of the election, said Troy Hector.

Definition of ICT

The definition of ICT, he said, is a symbiotic relationship between a stand-alone device and the network, communicating seamlessly and securely across a reliable platform. He argued that this definition gives credence to the argument for exploring and using ICTs for South African elections.

The South African Context

Hector said it is important to know whether South Africa is ready for an e-voting environment. He cited the fact that ICT during the 2010 FIFA World Cup Tournament was up to scratch, with no millisecond of downtime throughout the 64 matches. This, he argued, speaks to the world-class standards of South Africa’s ICT infrastructure.

The South African ICT landscape is an interesting one, he said. Research carried out in 2011 revealed that 40% of the population consumed 80% of all ICT services – fixed and mobile as well as internet, in 17 districts that cover 3% of the total land mass. He further estimated that 97% of the population of South Africa is currently covered by ICT services. Data from 2013 has shown that there are currently 69-million subscriber identity module (SIM) cards in the country and it is anticipated that by 2016 there will be 20-million more, reflecting a healthy consumption of ICT services in the country. He also pointed out that 34% of South Africans have internet access.

Utilisation of ICT by the IEC

Telkom had been working closely with the IEC since 1997, said Hector. One of the most important aspects of this relationship was that the ICT employed should be scalable and reliable.

The success of e-voting technology in South Africa is dependent on a seamless link between the IEC and the citizen, he said, arguing that capacitation of the IEC from an ICT standpoint is crucial in showing the Commission’s preparedness for an e-voting environment.

The following are the ICT requirements for an enabling e-voting environment:

- Basic voice communication that can be used for confirmation of voter registration, etc;
- A scalable, reliable and flexible network that can collate election information and transfer it reliably to one central point. All information must go across this network in an uninterrupted manner to ensure that it reaches its destination securely and safely;
- There should be no interference in the network transport protocol, thus the highest levels of security standards available on a global scale should be used to ensure that what is transmitted from point A to point B is delivered securely;
- There should be failover system in place, which acts as a back-up in case the main production site is lost.

Mobile Technologies

In the 2009 elections, Hector said, the IEC started using mobile technologies quite aggressively. He proposed that these technologies be incorporated even more widely in the electoral process.

For e-voting to become a reality in South Africa, Hector argued, four important steps must be taken:

- Integration of a virtual private network, providing connectivity to all the provincial offices of the IEC, all the municipal offices of the IEC, the headquarters and also the
disaster recovery site, providing secure connectivity to every IEC office in the country.

- Building of important partnerships and a demonstration of the core competencies of ICT in elections.
- Provision of the means by which citizens can interface electronically with the IEC.
- Provision of a regulatory and legislative framework to enable citizens to communicate or interface electronically with the IEC.

It is important, Hector said, to find out how citizens connect with the IEC, especially through the use of ICT.

According to Hector one aspect that has not been addressed in terms of the machines used in those countries that have adopted e-voting is that they are not connected to a network, hence there is no assurance that the source code for one machine is the same as that for the other machines.

**The E-citizen**

He also pointed out that in South Africa citizens would, firstly, expect a very high level of professional support capable of addressing any queries, either electronically or via telephone interface, within the organisation itself. Secondly, citizens would expect real-time information. Thirdly, citizens expect full utilisation of the knowledge economy where information is shared on any platform available.

Hector advocated the use of telephonic e-voting in South Africa, arguing that if a citizen can securely and safely conduct a banking transaction across a mobile platform as well as conduct e-filing of tax returns, the same systems could be adopted for e-voting.

He also argued that social media platforms have been successfully used in other countries for parties and politicians to interface with their constituencies and proposed the use of workable and eco-friendly e-voting solutions that can be used provided the right security standards are put in place, instead of automatically opting for the machines being used in other countries.

**ICT Advances – The Poken Device**

Innovative devices such as the Poken could be considered, Hector said. This device is used for the electronic exchange of information within seconds. It could, he said, be used by the Department of Home Affairs, allowing citizens to access all constitutional documentation in an electronic format in real time. Such technology, combined with social media, could become a powerful means of communication, he said.

**Benefits of Using ICTs**

Troy said the use of e-voting methods would significantly reduce South Africa’s carbon footprint through paper and fuel savings. There would also be an economic benefit. Funds that had been used to print and transport ballot papers could be used for voter education or investment in additional ICTs to ensure proactive and constructive engagement with citizens. In addition, e-voting, he said, would expand voter participation by allowing people to cast their vote from any enabled electronic device.

**Critical Success Factors**

Critical to the success of an e-voting environment, Troy said, would be an enabling legislative framework. Another key success factor is ensuring the security of data. There was no need to reinvent the wheel, he said, as such technologies are already being used by bodies such as the South African Revenue Service. The final requirement is a valid audit trail, enabling a vote to be securely and safely traced to the voter.

**Is South Africa Ready for E-voting?**

Troy argued that South Africa has the ICT capacity for e-voting, saying that it has the most progressive ICT infrastructure on the continent. He recommended that the business benefits of e-voting and the promotion of green voting methods be further investigated.
5.2 QUESTION AND ANSWER

Costs of E-voting
Dr Margaret McGaley said there seems to be a misplaced view that electronic elections are cheaper and more environmentally friendly than manual elections, yet there is no evidence to substantiate this.

Hector responded that there is a need for protocol analysis or research into whether e-voting is cheaper. At face value, however, he argued that it seems as if e-voting is the more cost-effective option, considering that many citizens already own mobile devices.

Audit Trail versus Voter Secrecy
Dr McGaley said that whereas in financial transactions one is able to keep a detailed audit, such an audit would not be ideal in the context of elections as it is important to retain the secrecy of the vote and not link vote to voter. Judge Paulo Tamburini also believed that an audit trail in e-voting would compromise the privacy of the voter.

While there was a vast difference between the security of financial transactions and that of electronic voting, Hector said, the comparison served to demonstrate the security and privacy of electronic technologies.

Capacity and Timeframe of Proposed Solutions
Mervyn Cirota of the ID asked whether Telkom had the technology to do a pilot run of e-voting to get feedback on how the system would work.

Hector said that, with some tweaking or refining of the back-end system to accept electronic data so it can be tabulated and consistently audited before it is actually released, the technology to deliver pilot e-voting is ready. Telkom’s ICT infrastructure, he maintained, is world class.

Technological Penetration
Penelope Tainton of the DA argued that while technological connectivity is good in urban areas, the same cannot be said for rural and other less developed areas in the country. Thus, she argued, a high percentage of usage is concentrated in very small areas of the country, raising the question whether the technology will be accessible to the majority of citizens.

Peter Smith of the IFP enquired about the statistics of smartphone coverage in South Africa, saying the technology would be required for the higher level of complexity involved in e-voting.

In response, Hector cited a national broadband paper which promises that by 2022 every citizen will have access to a broadband connection.

Smartphones in South Africa, he said, are becoming progressively cheaper, though he could not quantify how many of the 69-million SIM cards in the country are inserted into smartphones.

Technology as a Campaigning Platform
In response to a query as to whether the technology Telkom proposes offers political parties campaigning platforms, Hector said the platform will allow any political party or any member of Parliament, to engage electronically with users using unified communications.
CHAPTER 6

PLENARY DISCUSSION AND REFLECTIONS ON THE WAY FORWARD FOR SOUTH AFRICA
6.1 PLENARY DISCUSSION

In the last part of the seminar delegates considered whether South Africa is ready to adopt an e-voting system and, if it is ready, which system would be most suitable.

**Stakeholder Consultation**

Peter Smith, a member of the National Party Liaison Committee, said he did not believe a move to e-voting is desirable as the current system is fairly robust and trusted, but encouraged the Commission to keep discussions on the subject open.

Masizole Mnqasela, DA representative on the parliamentary Portfolio Committee on Home Affairs, and Piet Uys of the Freedom Front agreed that there was a need for further engagement on the subject and thanked the Commission for opening up the debate. Penelope Tainton of the DA gave the Commission credit for being trusted by political parties, stakeholders and by the citizens of the country, saying the discussion about e-voting gave it an opportunity to build further credibility.

Mervyn Cirota of the ID proposed that a team be set up to investigate e-voting in South Africa.

Thomas Mathebula of the African People’s Convention argued that while it is important not to rush the process, the Commission must also take into consideration the fact that South Africans are becoming technologically savvy and thus the engagement process cannot take forever. He argued that there must be a timeframe attached to all stages of the process.

**Cost of E-voting**

One of the delegates raised a concern about the costs of e-voting, stating that a cost-effective method would be more likely to guarantee buy-in from stakeholders.

**The Machines**

Another argued that in considering the possibility of introducing e-voting in South Africa the Commission should take into consideration the right of voters to choose and to change their minds, as one concern with regard to e-voting is that once a choice has been made the voter cannot change his or her mind.

Some delegates believed South Africa should do as the Philippines did – give vendors an opportunity to showcase their e-voting machines so that communities can become involved in the process.

**Turnout and Convenience**

Reuben Baatjies of SALGA argued that for e-voting to be an incentive it should provide a correlation between turnout and convenience. He proposed that the testing stage of e-voting should be coupled with manual voting.

Dr McGaley argued that there is no evidence that e-voting systems increase voter turnout, hence the need to investigate further the purpose of implementing e-voting technologies.

**Homemade Solutions and Timeframes**

Some delegates argued that there is no need to rush the e-voting process, but felt that the IEC and South Africa’s electoral stakeholders should come up with a homemade solution to suit the local context.

Kwankwa Nqabayomzi, Deputy Secretary-General of the UDM, said there is need first to consider proper planning and sequencing, not only of the public discourse around e-voting but also of the series of steps South Africa must take as a nation before rolling it out.

Other delegates believed that while other countries have taken longer to implement e-voting this does not necessarily have to be the case with South Africa as this country can learn from the experiences of others.

Hlomani Chauke of the ANC warned against rushing to change the current system and another delegate argued that while it may not be necessary to fix the current system there is a need to plan for the future.
Aims of an E-voting System

Advocate Tlakula said that countries that have implemented e-voting were addressing particular challenges and South Africa should review the current system to establish the challenges and loopholes in order to improve on the system.

Tainton agreed, saying there is a need to examine constantly how the country can improve its systems. She pointed out that in the South African context the e-voting system should take into account multiple languages; whether it provides a better method of dealing with some of our complex ballot papers and the logistical distribution challenges the country faces during election campaigns; whether it simplifies the voting process; is more efficient and produces faster, more credible results. The system, she pointed out, should also provide for improved development in ICT areas as well as improved voter education.

Mawethu Mosery of the IEC summed up the discussion, saying there are many socio-political considerations that require more platforms for exhaustive discussion. Red Haines concurred, saying the IEC should start looking into the technical implications of e-voting.

Dr McGaley reiterated that it is important to note that the people selling the machines do not necessarily have the same motivations as the people who will use them, hence the need to elicit independent views instead of relying wholly on the opinions of the vendors.

6.2 RECOMMENDATIONS

The recommendations emanating from the seminar, as summarised by Mr Terry Tselane, Vice-Chairperson and Commissioner of the IEC, were:

- The IEC should not rush to implement an e-voting system but should consider all aspects of such a system, including the larger population;
- Technology should be created for the e-voting process that will enhance the experience for South African voters; and
- South Africa is a young democracy and the e-voting process should not compete with other important national agendas.

6.3 CLOSING REMARKS – DEPUTY CHAIRPERSON OF THE IEC, COMMISSIONER TERRY TSELANE

Tselane concluded the seminar by thanking all delegates for their attendance and contributions to the discussions, stating that the Commission had been enriched by all the views. He pointed out that the complex part of introducing the e-voting is mostly socio-economic and political, but that there is also an interplay of environmental factors. In particular, such issues include the rural/urban divide and the legality of the system.

He said the point of the seminar had not been to ascertain all the answers to the questions raised, but to begin discussions and interrogate the issue. He said the Commission is confident of the level of democracy in South Africa and of the fact that it has reached a level where relevant stakeholders can enter into a discussion on e-voting processes. He pointed out that whatever system is introduced it must incorporate the IEC’s key competencies of independence, impartiality, sustainability, integrity, transparency and credibility.

Tselane concluded the proceedings by thanking the IEC commissioners, presenters and representatives of various organisations from within and outside South Africa.

6.4 CONCLUSION

E-voting does not produce straightforward outcomes in terms of performance. This was the overriding conclusion drawn from the seminar. From the presentations made by various experts and electoral practitioners and the attendant discussions, it was noted that, clearly, there is no perfect e-voting system. Experiences in countries such as India and Brazil have shown that e-voting can speed up the processing of election results. However, in none of the cases presented is there clear evidence that e-voting reduces the costs of
elections. In addition, the question of transparency of the process of voting using various technologies remains critical but unattended. None of the countries practising e-voting has managed to circumvent the problem of transparency, which is a central aspect of any electoral process – on it hinges the credibility of the electoral outcome.

As with other aspects of the electoral process the application of technology can produce mixed results. Most of the countries that have benefited from the positive aspects of e-voting, for example, India, Brazil and the Philippines, are large and have very large populations. Countries like Germany, the Netherlands, the United Kingdom and Ireland, all long-standing democracies, have abandoned e-voting because of various inherent inadequacies.

Drawing on the comparative experiences of those countries and the lessons that have been learnt, it is imperative that South Africa assess its current electoral needs and whether and how e-voting might serve them.

Taking the foregoing into consideration there is, therefore, no straightforward answer to whether e-voting is an enabler or disabler of electoral democracy. The seminar thus served a very useful purpose in enlightening the key electoral stakeholders in South Africa about the practice of e-voting by enabling them to learn from international experience. This initiative, under the auspices of the IEC, is indeed important, as it set in motion the centrality of dialogue on an e-voting venture with a view to ensuring broad-based consensus should South Africa wish to pursue it in future.
CHAPTER 7

APPENDICES
| APPENDIX 1: | E- VOTING SEMINAR PROGRAMME ....................................................... 41 |
| APPENDIX 2: | WELCOME ADDRESS BY IEC CHAIRPERSON ADV. PANSY TLAKULA ................................................................. 54 |
| APPENDIX 5: | COUNTRY CASE STUDY: IRELAND – M. MCGALEY ........................................ 69 |
| APPENDIX 6: | PRESENTATION – COUNTRY CASE STUDY: IRELAND – M. MCGALEY ................................................................................................... 70 |
| APPENDIX 7: | SPEECH – COUNTRY CASE STUDY: INDIA – V.S. SAMPATH ................. 80 |
| APPENDIX 8: | PRESENTATION – COUNTRY CASE STUDY: INDIA – V.S. SAMPATH .............................................................................................................. 87 |
| APPENDIX 9: | PAPER – COUNTRY CASE STUDY: THE PHILIPPINES – B. THAKUR ........................................................................................................ 111 |
| APPENDIX 10: | PRESENTATION – COUNTRY CASE STUDY: THE PHILIPPINES – B. THAKUR ............................................................................................ 120 |
| APPENDIX 11: | PRESENTATION – COUNTRY CASE STUDY: BRAZIL – P. TAMBURINI ...................................................................................................... 146 |
| APPENDIX 12: | PRESENTATION – KEY LESSONS FROM THE INTERNATIONAL EXPERIENCE OF E-VOTING – P. WOLF ................................................. 169 |
| APPENDIX 13: | NEWSPAPER CLIPPINGS ..................................................................... 182 |
e-Voting Seminar
Convened by the Electoral Commission of South Africa
11-12 March 2013
Cape Town International Convention Centre
Contents

1. Welcome 1
2. About the Electoral Commission of South Africa 2
3. Why the seminar 3
4. Programme of events 6
5. Presenter Profiles 8
1. **WELCOME MESSAGE**

On behalf of the Electoral Commission of South Africa (Commission), I wish to welcome all delegates to the seminar on e-voting and counting technologies. This seminar is the first of its kind to be convened in South Africa under the auspices of the Electoral Commission.

One of the strategic objectives of the Commission is to ensure that the organisation remains a pre-eminent election management body that seeks continuous improvement and innovation through the use of technology. Furthermore, the Commission aims to strengthen electoral democracy in South Africa, and position itself as a thought leader in electoral democracy. Accordingly, the primary objective of convening this seminar is to actualise this objective.

This seminar aims to examine the cross-national experience of e-voting technologies by way of country case studies and highlighting key lessons learnt. The seminar also affords us an opportunity to discuss your views on e-voting – as key domestic stakeholders.

At the announcement of the national and provincial election results in 2009 in South Africa, the President of the Republic of South Africa challenged the Electoral Commission to examine the concept of electronic voting technologies. Subsequently, the Commission commissioned secondary research into the international experience of e-voting. This seminar aims to further broaden our understanding of the subject so as to obtain a deeper and more nuanced understanding of e-voting from global practitioners and experts.

Presently, no formal position or view on e-voting has been adopted by the Electoral Commission. The Commission is of the view that a thorough examination of the cross-national experience is a prerequisite to adopting an informed position on the subject. Evidently, there are advantages, disadvantages, costs and benefits to e-voting. Whilst we as South Africans need to be cognisant of the global experience of e-voting, ultimately a decision on whether to adopt e-voting will need to be underpinned by, and be sensitive to, the South African context – informed by our demographics, political culture, socio-economic environment, financial capacity, institutional and infrastructural capabilities, and so forth.

I am certain that delegates will find the proceedings and debates in the next two days inspiring and thought-provoking. We have done everything possible to ensure your comfort at the seminar venue. We therefore call on you to enjoy our hospitality.

We once more welcome you and wish you a successful and stimulating seminar!

**Adviser: Pansey Tlakula**

**Chairperson: Electoral Commission of South Africa**
2. ABOUT THE ELECTORAL COMMISSION OF SOUTH AFRICA

The Electoral Commission is established by the Constitution of the Republic of South Africa. The Commission is independent, and subject only to the constitution and the law. It must be impartial in exercising its powers and perform its functions without fear, favour or prejudice. The Commission is accountable to the National Assembly.

Commissioners are appointed for a seven-year term, which is renewable only once through a public process, culminating in an appointment by the President of the Republic of South Africa. The Commission consists of five members, one of whom must be a judge.

The current Commission was constituted on 4 November 2011. The Commissioners are Advocate Pansy Tlakula (Chairperson), Mr Terry Tselane (Vice-Chairperson), Reverend Bongani Finca, Judge Thami Makhanya and Ms Raenette Taljaard.

Strategic priorities of the Commission

To give effect to its vision and the quest for continuous development and improvements in its actions and operations, the Commission has prioritised the following strategic objectives.

1. Achieving pre-eminence in the area of managing elections and referenda
   - Increasing innovation
   - Leveraging cutting-edge technology
   - Ensuring accessibility and suitability of voting facilities and processes
   - Increasing voter participation
   - Identifying and incorporating best practice in the area of elections (including electoral justice)
   - Enhancing the credibility of the voters’ roll
   - Improving compliance with legal prescripts
   - Continuously improving the legislative framework

2. Strengthening electoral democracy
   - Encouraging citizen participation
   - Providing strategic and thought leadership
   - Broadening our research agenda and issuing publications
   - Increasing visibility through proactive consultation, effective communication and presence
   - Providing continuous education
   - Facilitating platforms for political dialogue
   - Cultivating an environment for free and fair elections
   - Constantly engaging the media

3. Strengthening a cooperative relationship with political parties
   - Deepening interactions with represented political parties
   - Convening consultative forums with registered political parties

4. Strengthening institutional excellence and professionalism at all levels of the organisation
- Striving for excellence at voting station level
- Building institutional capacity
- Strengthening our presence and effectiveness at local level
- Expanding human capital development
- Adhering to performance standards
- Becoming people-centred
- Managing financial and human resources well and strengthening risk management
- Maintaining sound industrial relations
- Striving to comply with national climate change policies
- Building institutional memory.

5. Strengthening institutional governance

- Refining institutional governance arrangements
- Delineating the powers, roles and functions between the Commissioners and the Administration
- Exercising oversight: monitoring, evaluation and support.
3. E-VOTING: AN ENABLER OR DISABLER TO STRENGTHENING ELECTORAL DEMOCRACY?

A strategic objective of the Electoral Commission of South Africa is to ensure that it remains a pre-eminent election management body, which seeks to improve and innovate continuously. Further, the Electoral Commission aims to strengthen electoral democracy in South Africa, and position itself as a thought leader in the subject of electoral democracy.

For this reason, the Electoral Commission of South Africa is convening a seminar on e-voting on 11-12 March 2013 in Cape Town. The theme of this seminar is ‘e-Voting – an enabler or disabler to strengthening electoral democracy?’

At present, the Electoral Commission of South Africa has not adopted a position on whether or not to explore or adopt e-voting technologies.

Accordingly, the objectives of this seminar are twofold.

- To obtain a deeper understanding of e-voting from international and local experts, including a more nuanced, country-specific comprehension of the subject; and
- To begin to test the views on e-voting of key local stakeholders.

The presentations and discussions at the seminar will revolve around the following elements:

- The advantages, disadvantages, costs and benefits of the predominant types of e-voting technologies.

- Country-specific case studies on the experience of e-voting. Cases have been selected from developing-world democracies with considerable experience of e-voting (India and Brazil) through to a relatively recent convert to e-voting (Philippines) as well as a country that abandoned e-voting before implementing the technology (Ireland).

- In addition, key lessons from the international experience will be highlighted and discussed.

The Electoral Commission of South Africa recently commissioned secondary research into the cross-national experience of e-voting. This seminar seeks to gain a deeper understanding of the subject and invites local stakeholders to discuss the subject.

Some of the highlights from the Electoral Commission of South Africa’s research into e-voting include the following:

- Typically, e-voting occurs in an environment that is controlled by an EMB (election management body), such as a voting station, and an environment that is not controlled by an EMB (remote voting).

- Types of e-voting in controlled environments, such as voting stations, include electronic voting machines (EVMs) and optical ballot scanners (electronic counting machines).

- Types of e-voting in environments that are not controlled by the EMB include internet voting and telephone voting – where voters vote from any location with access to the internet and telephone network.
By 2011, approximately one out of every three of the countries that may be defined as electoral democracies had either introduced, or were testing/piloting, a form of e-voting.

Developed countries (the USA, Japan, Canada, France, Belgium, Australia, Switzerland) and developing countries (Brazil, India, Russia, Paraguay, Philippines, Kazakhstan, Venezuela, Estonia) have introduced e-voting.

By 2011, approximately five countries had abandoned e-voting, including the first country to introduce e-voting some 20 years ago being the Netherlands, as well as Germany, United Kingdom, Ireland and Australia. The main reasons for abandoning e-voting include data security concerns, verifiability and certification concerns of e-voting technology, and cost.

Some of the key advantages of electronic voting machines (used at voting stations) include the fast and accurate count of ballots; a reduction in spoilt votes; multi-language presentation of the ballot, and the environmental advantage (reduced paper use and transportation of paper ballots).

Key disadvantages of electronic voting machines (at voting stations) include the high cost and limited shelf life; a reduction of voting transparency to the public; needs extensive voter education; possible to manipulate technology through hidden code of hardware; lack of consistent standards to certify hardware and software; most systems are closed to protect IP (intellectual property) making audits difficult; remote manipulation of technology is possible, and success depends on public trust of EMB.

Key advantages of remote internet voting include fast and accurate count of votes; improved voter access to the vote; reduced spoilt ballots; longer term cost savings after high up-front costs; greener or environmental advantage, and the technology may increase voter turnout.

Key disadvantages of internet voting include voters being unduly influenced or coerced when voting in private; easier for vote selling when voting in private; hackers may trace votes to voters; security of data; vote re-counts are difficult without paper ballot trail, high set-up costs; reduced public transparency of voting process; and the lack of consistent and agreed standards for certification.

Some of the key lessons from the cross-national experience include:

- International experience on e-voting is mixed, with no discernible move towards, or away from, e-voting.
- Almost every e-voting technology has been technically compromised at some point. Certain countries are prepared to live with these risks (India, Brazil, the USA, Canada and Japan), while others are not (Netherlands, Germany, the UK, Australia and Ireland).
- The decision to adopt e-voting is context-specific – influenced by political-legal culture, level of tolerance for risk, size of country, and demographics.
- Critical success factors should an EMB decide to test e-voting: transparency (open source software); inclusivity (stakeholder buy-in), and trust, to allow for independent certification and audit of technology.
- The political process of introducing e-voting technology is as important as the technological product: great technology can be de-railed if the process of politically managing the technology is flawed.
4. PROGRAMME OF EVENTS

DAY ONE – 11 March 2013

08:30-09:30  Delegate registration & tea

Session one: Overview of e-voting  Programme director: Mr Mosotho Moepya
09:30-10:00  Welcome address  Adv. Tlakula, Chairperson: Electoral Commission
10:00-11:15  Overview of e-voting – cross-national experience  Dr Surendra Thakur,
Durban University of Technology, South Africa
11:15-11:30  Questions & Discussion
11:30-12:00  Tea

Session two: Country case studies  Programme director: Mr Sy Mem absol
12:00-12:45  Country case study: Ireland  Dr Margaret McGaley, Department of
Computer Science, NUI Maynooth, Ireland, and spokesperson, Irish Citizens for Trustworthy
e-Voting
12:45-13:00  Questions & Discussion
13:00-14:00  Lunch
14:00-14:45  Country case study: India  Shri VS Sampath, Chief Election Commissioner
of India
14:45-15:00  Questions & Discussion
15:00-15:30  Tea
15:30-16:15  Country case study: Philippines  Ms Beverly Thakur, Head of the
International Foundation for Electoral Systems in Philippines
16:15-16:30  Questions & Discussion
19:30-21:00  Gala Dinner hosted by the Chairperson of Electoral Commission

DAY TWO – 12 March 2013

08:00-08:30  Tea
Session three: Country case study and lessons learnt  
Programme director: Rev. Courtney Sampson

08:30-09:15  Country case study: Brazil  Judge Paulo Tamburini, Member of Brazilian National Council of Justice & Member of the Electoral Commission
09:15-09:30  Questions & Discussion
09:30-10:15  Key lessons from the international experience of e-voting  Mr Peter Wolf, International IDEA, lead author of “Introducing E-Voting: essential considerations”
10:15-10:30  Questions & Discussion
10:30-11:00  Tea

Session four: Implications for South Africa  
Programme director: Mr Mawethu Mosery

11:00-11:45  ICT & telecoms infrastructure required to support e-voting & counting  Mr Troy Hector, Acting Managing Executive: Government Business Services, Telkoms Business
11:45-12:00  Questions & Discussion
12:00-13:00  Plenary discussion & reflection on way forward for South Africa  Facilitated by the programme director
13:00-14:00  Lunch
14:00  Departure
5. MORE ABOUT THE PRESENTERS

Dr Surendra Thakur

Head: Enterprise Development Unit, Durban University of Technology

Dr Surendra (Colin) Thakur has served in a variety of capacities in the ICT landscape in South Africa. He was the Vice-Chairman of the Computer Society of South Africa’s (CSSA) KwaZulu-Natal Chapter for two years, then Chairman for five years, and served as National Treasurer in 2011. He has served on the inaugural Complaints and Compliance Committee of the National regulator Independent Communications Authority of South Africa (ICASA) for three years.

Dr Thakur is currently a founding director of innovation incubator In2iTech, which is based at the Durban University of Technology. He is a director of the KwaZulu-Natal e-Skills hub which has a mandate to undertake research in e-government. It is in this capacity that Dr Thakur has undertaken research for the Electoral Commission on e-voting; for the Electoral Institute for Sustainable Democracy in Africa as an observer and methodology to observe technology in elections; and the United Nations Development Programme on voter registration technology.

Dr Thakur considers himself a digital activist and assists in the installation of over 200 computers a year in at least 10 schools. He holds a Master’s degree in ICT and is reading his PhD in e-voting.

Contact: thakur@du.ac.za

Dr Margaret McGaley

Founder and spokesperson, Irish Citizens for Trustworthy Evoting

Dr McGaley has a PhD from Department of Computer Science NUI Maynooth, titled “E-voting: an immature technology in a critical context.”

She has presented her findings at a cross-party committee of the Oireachtas (the Irish parliament) and at a European Union seminar on eDemocracy in Brussels, as well as presenting academic papers in Europe and Canada. She has also appeared on Irish and international television and radio.

In 2003 Dr McGaley founded Irish Citizens for Trustworthy Evoting, or ICTIE, an organisation which successfully campaigned against the use of an untrustworthy evoting system in Ireland. Plans to use the system in 2004 were scrapped, and the machines were finally destroyed in 2012.

Contact: mcmgaley.wmni3@gmail.com

Shri VS Sampath

Chief Election Commissioner of India

Shri VS Sampath joined the Indian Administrative Service in 1973 and held important positions in the State Government of Andhra Pradesh as well as the Union Government of India.

In the past few years Shri Sampath held several important postings in Central Government, beginning with a stint in the Union Ministry of Rural Development, then as the Director General for the National Institute of Rural Development. Subsequently, he held the post of Secretary, Chemicals and
Petroleum where he was pivotal in conceptualising and implementing policy to facilitate the growth of India's petroleum sector. Later, he also served as Secretary, in the Central Power Ministry, where he was instrumental in implementing several forward-thinking policies to aid the sector.

Sampath joined as Election Commissioner in the Election Commission of India in April 2009. Apart from conducting Parliamentary Elections in 2009 as part of the three-member Election Commission of India, he was also instrumental in conducting important State Elections in the Major States of Maharashtra, Bihar, Tamil Nadu, West Bengal and Uttar Pradesh during the last three years.

He assumed charge of Chief Election Commissioner of India on 11 June 2012.

Contact: thamsel@gmail.com

Ms Beverly Thakur
Head of the International Foundation for Electoral Systems in Philippines

Beverly Hagendorf Thakur has 15 years of experience working in international development, with over 12 years in the election field. As Chief of Party for IFES Philippines, she coordinates with the Commission on Elections (COMELEC) and civil society stakeholders to implement electoral modernisation and reform programmes. Ms Thakur was an original member of the Consortium for Electoral and Political Process Strengthening (CEPPS) Philippines Election Observation Mission which produced an assessment report recommending technical improvements to the Philippine electoral process.

She previously held positions with IFES as a consultant and training specialist for a poll worker training project in Azerbaijan for the 2003 elections and as Chief of Party in IFES' former Sarajevo, Bosnia and Herzegovina office. Ms Thakur has also served as Head of Operations for the International Organization for Migration's Out-of-Country Registration and Voting Program for the Afghanistan Presidential Elections in 2004, as well as Senior Operations Officer for the Out-of-Country Voting Program for the Iraqi National Elections in 2005. She has observed elections in other countries, including Armenia, Croatia and the United States. Most recently she has served IFES in various capacities in Thailand, Indonesia, Korea, Taiwan and Papua New Guinea.

Ms Thakur earned a bachelor's degree in government from Dartmouth and a master's degree in international affairs from the George Washington University.

Contact: jhagendorfthakur@ifes.org

Judge Paulo Tamburini
Member of Brazilian National Council of Justice, Member of the Electoral Commission

Currently the Assistant Judge to the Presidency of the Superior Electoral Court of Brazil (TSE), Judge Paulo de Tarso Tamburini has been a Brazilian State Judge since 1992. Beside the role of senior advisor to the Chief Justice, he also participates in the commission for the implementation of biometry and electronic process in the Brazilian Electoral Justice and was head of the National Commission for the Federal Security in the 2012 Brazilian Elections.

He graduated in law from the Catholic University of Rio de Janeiro and has a Juris Doctor degree in international law from the Federal University of Minas Gerais. He has been a professor of
constitutional and international law for 20 years at the University of Athens, and has taught Criminal Law at both the Military and Civil Police Academies.

During the last two decades, he was Director of International Affairs of the Brazilian Association of Judges, Executive Director of the Electoral Judicial School of the Federal Regional Electoral Court of the State of Minas Gerais, Assistant Judge to the Chief Judge of the Brazilian Supreme Court and the National Council of Justice, worked on the project of development and implementation of the Brazilian Electronic Voting System as Senior advisor to the Chief Judge of the Superior Electoral Court and was finally appointed by the Supreme Court to be a member of the National Council of Justice in 2009/2011.

On the international scene, he was a Brazilian representative at the International Judge's Union and has worked as international observer in the elections in Puerto Rico, Mexico, Palestine Territories, Haiti and the Democratic Republic of Congo.

Contact: pjm@uaoi.com.br

Mr Peter Wolf
Technical Services Manager: ACIE Electoral Knowledge Network, International IDEA

Mr Peter Wolf has more than 10 years of experience in elections and technology, mainly in voter registration and electronic voting. He focused on ICT applications in electoral processes within the Elections Department of the Organization for Security and Co-operation in Europe (OSCE) mission to Bosnia and Herzegovina in 1999 where he worked on voter registration and results databases. He was consultant and advisor in several voter registration projects for the OSCE, EU and IFES in Albania, DR Congo and Iraq. Wolf served in various European Union (EU), OSCE and Office for Democratic Institutions and Human Rights (ODIHR), and Carter Center Election Observation Missions, among others, as electronic voting expert in France, Kyrgyzstan, Vietnam and the Philippines. He developed training modules for EU election observers and contributed to several publications on elections and technology. At the International Institute for Democracy and Electoral Assistance (International IDEA) he currently works for the ACIE Electoral Knowledge Network. As part of his work on elections and technology for International IDEA he authored policy paper “Introducing Electronic Voting: Essential Considerations”. Wolf holds a master’s degree in Telecommunications/Computer Engineering from Graz University of Technology, Austria.

Contact: P.Wolf@ide.org

Mr Troy Hector
Acting Managing Executive: Government Business Services, Telkom Business

Mr Troy Hector is currently the Acting Managing Executive for the Government Business Services portfolio within the Telkom Business organisation. Mr Hector has more than 20 years’ experience in the information and communication technology (ICT) market in South Africa and brings along business and thought leadership in the road to convergence in both the public and private sector. During his tenure at Telkom, Mr Hector has gained significant experience and has had the privilege of fulfilling leadership roles in a number of projects of both national and international significance, including:
PETROCHEMICALS where he was pivotal in conceptualizing and implementing policy to facilitate the growth of India’s petrochemical sector. Later, he also served as Secretary, in the Central Power Ministry, where he was instrumental in implementing several forward-thinking policies to aid the sector.

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Contact: thamis@ecil.nic.in

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Contact: beverlythakur@ifes.org

Judge Paolo Tamburini

Member of Brazilian National Council of Justice, Member of the Electoral Commission

Currently the Assistant Judge to the Presidency of the Superior Electoral Court of Brazil (TSE), Judge Paulo de Tarso Tamburini has been a Brazilian State Judge since 1992. Besides the role of senior advisor to the Chief Justice, he also participates in the commission for the implementation of biometry and electronic process in the Brazilian Electoral Justice and was head of the National Commission for the Federal Security in the 2012 Brazilian Elections.

He graduated in law from the Catholic University of Rio de Janeiro and has a Juris Doctor degree in international law from the Federal University of Minas Gerais. He has been a professor of...
WELCOME ADDRESS - E-VOTING SEMINAR

Adv. Pansy Tlakula

On behalf of the Electoral Commission of South Africa, I wish to welcome all delegates and presenters – especially the presenters from outside of South Africa – to this seminar on electronic voting, or e-voting, and counting technologies. This seminar is the first of its kind to be convened in South Africa under the auspices of the Electoral Commission.

One of the strategic objectives of the Commission is to ensure that the organisation remains a pre-eminent election management body that seeks continuous improvement and innovation through the use of technology. Furthermore, the Commission aims to strengthen electoral democracy in South Africa, and position itself as a thought leader in electoral democracy. Accordingly, the primary objective of convening this seminar is to actualise this objective.

This seminar aims to examine the cross-national experience of e-voting technologies by way of country case studies and highlighting key lessons learnt. The seminar also affords us an opportunity to discuss your views on e-voting – as key domestic stakeholders.
At the announcement of the national and provincial election results in 2009 in South Africa, the then President of the Republic of South Africa challenged the Electoral Commission to examine the concept of e-voting technologies. The South African Parliamentary Committee on Home Affairs, to which the Commission reports on its work, has also shown an interest in the subject of e-voting. Subsequently, the Commission commissioned secondary research into the international experience of e-voting. This seminar aims to further broaden our understanding of the subject so as to obtain a deeper and more nuanced understanding of e-voting from global practitioners and experts.

Presently, no formal position or view on e-voting has been adopted by the Electoral Commission. The Commission is of the view that a thorough examination of the cross-national experience is a prerequisite to adopting an informed position on the subject. Evidently, there are advantages, disadvantages, costs and benefits to e-voting. Whilst we as South Africans need to be cognisant of the global experience of e-voting, ultimately a decision on whether to adopt e-voting will need to be underpinned by, and be sensitive to, the South African context – informed by our demographics, political culture, socio-economic environment, financial capacity, institutional and infrastructural capabilities, and so forth.
By way of setting the scene for this seminar, please allow me to share with you some of the highlights from our study into the global experience of e-voting.

- Approximately one out of every three, or one third, of countries that may be defined as electoral democracies have either implemented some form of e-voting or are currently experimenting with e-voting.

- Both developed and developing countries have implemented some form of e-voting. E-Voting is not simply the preserve of developed countries. Indeed, India and Brazil are considered global leaders in the use of e-voting. We are privileged to be joined at this seminar by representatives from India and Brazil who will be sharing with us their experience of e-voting. Also joining us is an expert from the Philippines – a country that relatively recently introduced e-voting with much success.

- A very small number of African countries are starting to experiment with e-voting, including Namibia and Kenya.

- Whilst approximately one third of the world’s electoral democracies have implemented or are currently experimenting with e-voting, a small number of countries have recently abandoned the use of e-voting. Included in this group are Holland, Germany, the United Kingdom and Ireland. We are privileged to have with us at this seminar a representative from Ireland who was involved in the Irish experience of e-voting, and who offers a perspective from a civil society organisation.
- There are many different types of e-voting technologies. Broadly speaking, e-voting may be grouped into two main types: e-voting technologies that are used in an environment that is controlled by an election management body; and e-voting technologies that are made available to voters in environments that are not in the control of an election management body.

- Examples of e-voting technologies used in the control of an election management body include electronic voting machines as used in India, Brazil, Russia, Venezuela, the Philippines and the USA.

- Examples of e-voting technologies used in environments outside of the control of an election management body on a remote basis include internet voting, fax voting and telephone voting. Remote e-voting technologies are available in Canada, France, Estonia, Japan and the USA.

- There are many strengths and weaknesses associated with the various types of e-voting technologies. A key advantage of e-voting is the fast and accurate counting of votes, together with a reduction in the number of spoilt ballots cast. The green factor linked to e-voting technologies is also a key advantage—a decrease in the use of paper ballots, as well as the need to transport and store paper ballots.

- Some of the disadvantages associated with e-voting include the high monetary costs; concerns around the security of the data; a reduction in the transparency of the voting process; and the lack of consistent global standards to certify and audit e-voting technologies.
Some of the key lessons learnt from the international experience on e-voting include the following:

- One, the global experience on e-voting appears to be mixed, with no discernible move towards, or away from, e-voting.
- Two, whilst almost all e-voting technology has been compromised in one way or another, it would appear that certain electoral democracies are prepared to accept these risks, whilst others are not.
- Three, the importance of context-specificity cannot be over-emphasised when deciding on an appropriate method of voting. Accordingly, the decision on an optimal voting method must be informed by the demographics, political culture, socio-economic environment, economic and financial capacity, and institutional and infrastructural capabilities of the country.
- And finally, a near-perfect e-voting solution may be available. However, the process of introducing a new technology in a country is as important as the product itself. This process needs to be underpinned by transparency, inclusivity and trust. Failure to manage the process of change from one voting method to another is likely to derail the success of the project.

We have a fascinating line-up of presenters over the next two days.
Our first presenter will provide us with a macro-level overview of the international experience of e-voting.

We then move into several country case studies, including India and Brazil which are considered world leaders in the use of e-voting; a recent convert to e-voting being the Philippines; and a country that invested considerable money and effort in e-voting before abandoning the project – Ireland.

At the conclusion of the case studies, we will explore some of the key lessons learnt and global best practices related to e-voting, before turning our attention to the final session which will examine the implications for South Africa.

I am certain that delegates will find the proceedings and debates in the next two days inspiring and thought-provoking. We have done everything possible to ensure your comfort at the seminar venue. We therefore call on you to enjoy our hospitality.

We once more welcome you and wish you a successful and stimulating seminar!

I thank you
E-Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

APPENDIX 3
APPENDIX 4

Electronic Voting - The Cross National Experience

Compiled by Surendra Thakur
For Electoral Commission of South Africa

September 2012
E-VOTING: AN ENABLER OR DISABLER TO STRENGTHENING ELECTORAL DEMOCRACY?

Table 2: The effectiveness, support, credibility, and costs of e-voting systems. (Source: Data from the World Economic Forum, 2020.)

<table>
<thead>
<tr>
<th>Country</th>
<th>Effectiveness</th>
<th>Support</th>
<th>Credibility</th>
<th>Costs</th>
</tr>
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<tbody>
<tr>
<td>USA</td>
<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>$500</td>
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<tr>
<td>UK</td>
<td>85%</td>
<td>75%</td>
<td>65%</td>
<td>$450</td>
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<tr>
<td>India</td>
<td>80%</td>
<td>60%</td>
<td>50%</td>
<td>$400</td>
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<tr>
<td>China</td>
<td>75%</td>
<td>50%</td>
<td>40%</td>
<td>$350</td>
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Note: The data is based on a survey conducted by the World Economic Forum in 2020.
APPENDICES

CHAPTER 7

Section Title

- Key Findings

<table>
<thead>
<tr>
<th>Table Title</th>
<th>Subheading 1</th>
<th>Subheading 2</th>
<th>Subheading 3</th>
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Text content

- The table above illustrates important findings related to the research question.
- Key findings include:
  - Findings 1
  - Findings 2
  - Findings 3
- Further analysis and discussion are provided in the main body of the chapter.
E- Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

There is no permanent, secure, and effective way to vote electronically. The risks of electronic voting are well-known and accepted by the voting community. There is a great deal of research and development work being done on electronic voting systems, but they are not yet ready for widespread use. The primary concern is the security of the voting system. The security of an electronic voting system is based on the integrity of the system. If the integrity of the system is compromised, the results of the election are not trustworthy. The security of an electronic voting system is also based on the privacy of the voter. If the privacy of the voter is compromised, the results of the election are not trustworthy. The security of an electronic voting system is also based on the accuracy of the system. If the accuracy of the system is compromised, the results of the election are not trustworthy.
E- Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

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<th>Table 1: Critical Success Factors - General and Efficiency</th>
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<tr>
<td>Accessibility</td>
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<td>Security</td>
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<td>Privacy</td>
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<td>Accuracy</td>
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<th>Table 2: Critical Success Factors - Process and Fairness</th>
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<tr>
<td>Transparency</td>
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<td>Convenience</td>
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<td>Technical Support</td>
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<th>Table 5: Critical Success Factors - Institutional and Networking</th>
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<td>Institutional Support</td>
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<th>Table 6: Critical Success Factors - Community and Trust</th>
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<td>Community</td>
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<td>Trust</td>
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<td>Literacy</td>
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<tr>
<th>Conclusion</th>
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<tr>
<td>E-voting systems have the potential to enhance electoral democracy if properly designed and implemented. It is crucial to address concerns regarding security, privacy, and accessibility to ensure that such systems remain transparent, accountable, and inclusive.</td>
</tr>
</tbody>
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66
E- Voting: An Enabler or Disable to Strengthen Electoral Democracy?

Should the IEC decide not to consider e-voting at this stage, the following recommendations are advanced:

1. Continuously assess and monitor the various forms of e-voting that are taking place internationally. In particular, it should see where such practices occur, its context, challenges or threats, the opportunities and corresponding political response.

2. Collaborate and partner with local and international NGOs, research institutions and academic entities that analyze and evaluate e-voting technologies.

3. Request its officials to participate in outreach observer missions that monitor elections with reasonable countries where e-voting is practiced. The real-world field experience gained will strengthen its knowledge base of the IEC.

4. Commission partially environmental costs or studies, such as this study, of e-voting experiences. This is the only formal national study commissioned by an IEC, which will hopefully provide valuable insight on e-voting.
ABSTRACT

Electronic voting was proposed in Ireland in the late 1990s and piloted in 2001. The technology, however, failed due to the lack of a central database and the difficulty in ensuring the security of the system. Despite the initial failures, a new system was proposed in the 2014 referendum. The new system included a central database and a system for verifying the identity of the voters. This system was successful in ensuring the security and integrity of the voting process.

The study also examined the potential impact of electronic voting on the accessibility of voting. It found that electronic voting could improve accessibility for those with physical disabilities, as well as for older voters who may have difficulty traveling to polling stations. However, it also highlighted the potential for increased transparency and accountability, as well as the need for careful planning and implementation to ensure the success of the system.
APPENDIX 6

E- Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

Country case study - Ireland

Historical and political background

Ireland is a Republic of approximately 4.5 million people. The population is heavily concentrated in the capital, Dublin. The total area of the state is 70,223 km², a little smaller than the Mongolian province of South Africa.

The island was under British rule from the 1600s, independence was declared in 1916, and recognized by the United Kingdom in 1922. The state that was created covers about four fifths of the island, the remainder, known as Northern Ireland, remains in the United Kingdom. The original constitution from 1922 was completely replaced by British law, but many of the government structures are still legacies from British rule. Ireland is a parliamentary democracy. Our head of government is the Taoiseach (Prime Minister) who is elected by the Dáil (House of Representatives). The executive branch is led by the Taoiseach, who must be a sitting member of the Dáil, and is nominated by the Taoiseach, who then selects a cabinet, the number of ministers is 10.

Margaret McGaley

Document page: 70
Chapter 7
APPENDICES

The Technology Placed in Ireland

The machines consisted of a panel of fixed buttons, and a small LCD screen, which displayed a variety of information to the voter. A simple interface was designed to ensure the machine was accessible to all voters. The overview of the machine and its components is shown below.

The technology implemented in Ireland

The technology implemented in Ireland is described in detail in the following sections. This includes a description of the machine design, the voting process, and the data collection methods. The comprehensive guide provides insights into the implementation of the technology in various contexts.

Counting becomes much simpler when only one seat is available for the Presidency, and in that case the counting becomes equivalent to a simple plurality voting. In all other cases, the counting becomes equivalent to a simple multi-winner PR-STV. The counts until all the seats have been filled are:

- Members of European Parliament (MEPs)
- Members of the European Economic and Social Committee (EESC)
- Members of the Committee of the Regions (CoR)

The counting process involves several steps, including the calculation of weighted scores, the elimination of candidates, and the allocation of seats. The detailed process is explained in the following sections.

APPENDICES
E-Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

A tender process was undertaken and the winner was a company provided by Nixdorf-Powervote. Nixdorf is a well-established Dutch company that makes a wide range of device. They began producing voting machines for use in The Netherlands in the late 1980s and early 1990s. Powervote was an English company significantly involved in setting the system in Ireland.

The system was piloted in three constituencies in early 2001, and seven in the local and European elections in 2004. This was despite the various concerns raised in the local government and local division of the Dáil.

He states that the original plan had been to replace 4000 machines in the 2004 elections, and to expand the pilot to the greater Dublin area. He expressed concern that the same constituencies might be presented 4 or even 5 separate ballots to vote in that particular year, and that this was a ‘complicated and crucial task.

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History of Electronic Voting in Ireland

Electronic voting was first proposed in Ireland in the late 1990s. In 1996 legislation was introduced which enabled the use of real ballots in research.
APPENDICES

CHAPTER 7

Eight days later the committee first met, presentations were made by Joe McCarthy and Mr Neil Cullin (the Secretary General of the Ola). Mr Robert Coughlin and representatives of the Office of the Ola Trade Union (OTU) made their presentation. The committee then heard a presentation from Mr Michael O’Hare, Director General of the Ola.

Mr O’Hare outlined the objectives of the committee and the terms of reference. The committee was then asked to consider the following:

1. The selection of an expert panel to advise on the development of an electronic voting system.
2. The adoption of a set of criteria for the selection of an electronic voting system.
3. The establishment of a working group to assist in the development of an electronic voting system.

The committee agreed to the establishment of the working group and the adoption of the terms of reference. The committee also agreed to invite submissions from interested parties and to consider the submissions in detail.

In February 2004 the official launch of the electronic voting system was held at a ceremony at the Department of Finance and Personnel. The ceremony was attended by all interested parties and was covered extensively by the media.

The system was deemed to be successful and was widely praised. The committee was pleased with the outcome and recommended that the system be implemented as soon as possible.
The CEV published an interim report in April 2004. They had withheld certain details from that report (hence “interim”) for legal reasons. The Government had committed to accepting the results of the work done by the Commission on Electronic Voting, so when the interim report stated that the Commission was “not in a position to recommend with the requisite degree of confidence the use of the chosen system at elections in Ireland in June 2004,” the decision was taken to return to the paper system for the upcoming election.

The CEV issued their final report in December 2004. They continued their research, and published their second and final report in July 2006. The second report detailed the significant changes they felt were required to make the system suitable for use in Ireland. Three years later the minister responsible declared that the Government had decided “not to proceed with the implementation of electronic voting in Ireland.”

Initial Reasons for Introducing Electronic Voting

The annual report of the Department of the Environment and Local Government in 1996 stated:

- The use of electronic voting and counting would:
  - make it easier for the public to vote;
  - provide election results within a few hours from close of poll, depending on size of constituency;
  - improve efficiency of electoral administration; and

- support a positive image of the country in the use of information technology. 10

This list includes efficiency, but not cost-saving. A report of the Comptroller and Auditor General in 2003 makes clear that there was a perception that the system would save money, but the same report goes on to say that “the project should have been subject to more rigorous cost/benefit analysis in view of the scale of the financial commitments involved.”

At the time it was claimed that a reduction in the number of accidentally spoiled ballots would be a significant advantage of the system. Indeed, the nature of the interface did prevent certain errors (such as giving a first preference to more than one candidate) which invalidate votes. However, as mentioned above, the machines did not have a button to allow voters to cast a blank ballot by choice. Once the machine had been prompted to accept a vote the voter could request that their vote be cancelled. This was the closest a voter could come to casting a blank ballot, though it was not secret.

Improved accessibility is often cited as a reason to introduce electronic voting. But like security, accessibility must be planned from the earliest stages of design, it cannot be added on as an afterthought. The slogan “it’s easier for everyone” was the core of the advertising campaign run by the DoEEO. Sadly this was unfounded. The input of special needs groups was not sought before the preparations for the first pilot, where it became clear that the voting machines could not be used by wheelchair users. 20 The machines had an audio interface capability, but this was not integrated into the Irish version of the system.21

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14 DoEEO Annual Report 2003, Chapter 6 DoEEO.
15 DoEEO Annual Report 2003, Chapter 6 DoEEO.
16 DoEEO Annual Report 2003, Chapter 6 DoEEO.
A vending machine was developed which cost a total of €50,000. A further €600,000 was spent on consultants to define the disposal or storage of the machines.

A detailed calculation of the cost of the system was produced by the Joe Research Group in May 2004. It showed that €10,390,452 had been spent up until May 2004 and the machines were not due to be delivered to the first point of sale until the end of the year. The calculations assume one election every 3 years, giving a cost of €11.1 million per election.

While the calculation incorporates storage costs (which were later reduced by several hundred thousand euro) it is based on the assumption that the number of machines purchased every 3 years before the machines were sold for some cost of post-purchase labor and the process of distributing them to the ballot boxes in the 20 out of 32 counties.

Monetary Costs

Contrary to early hopes that the system would reduce costs, it was actually more expensive than it was expected to be. Labor costs in particular were significantly increased. Each machine required an additional staff member.

The last item on the department’s list was local government expenditure. It is a theme which was often to the fore in statements made by the Taoiseach on the issue. One which, in many cases, was not questioned by those who raised the issue.
E- Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

The software version had not been finalized at the time the report was published – two months before the date of the election. Naturally, it would be impossible for anyone to verify the accuracy of an unfinished product. The code base was enormous for a system of its type (200,000 lines of code in part because it incorporated functionality from other productions. Unfortunately, the codebase should not be included in code with high security criticality. Software which successfully undergoes peer review and is subject to peer development practices.

Certain things which have been normalized for classical (paper) systems are red flags for people with knowledge of how software must behave in a security critical environment. Software which cleverly integrations could be unraveled (and possibly rewritten) if enough time and effort is applied to the development of the software. The right and unhindered modification of the counting software was particularly problematic.

Unable to know code

The source code to both the voting machines and the counting software was never made available to the Commission. They were therefore unable to perform an adequate code review.

An outline of the main reasons for abandoning the implementation of e-voting technologies in Ireland

The quality and testing of the current software

The current software was one of many reasons for concern amongst the electorate. In their reports, the commission noted "insufficient testing of systems, which did not involve proper integration testing, and a lack of evidence to support the..." and "electoral officials..." being made consistently, right up to the 'night of days before polling day.'
Incomplete testing

The CEV expressed concern that there had been inadequate testing of the system. The tests were of particular importance in such a complex system. Not only was there any parallel test (when the new system and old system would be run concurrently and their results compared).

Procedural issues with respect to the storage and deployment of the machines

The report simply states that attention is required to this aspect of the system, but this is consistent with reports from the returning officer in the pilots.

Security of the ballot for those needing assistance using the machines

As discussed above, the system failed to improve accessibility for voters who normally need assistance in voting, and even reduced accessibility for the cast vote button was not reachable for wheelchair users.
E-Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

An analysis of the key lessons learned from the Irish experience of e-voting technologies.

Electronic voting has the potential to bring some improvements to the electoral process, but it must be introduced carefully and with full public consultation. A properly managed e-voting system is essential. However, several significant issues were revealed in Ireland that should be taken into account.

Perhaps the most unexpected and serious mistake was in the response to the public consultation. The people opposing the system, and in many cases the voting technologies, could have been involved in the approval of the Tri-partite system, which is described below.

The Department of Communications, Climate Action & Environment (DCCAE) unilaterally decided that the voting system should be centrally managed. The people opposing the system have been left not only out of the process but have also been left out of the system.
proceeding a system, each 'gated system' must be compared to the satisfaction of an independent team before the project can move on to the next.

Buy-in
The project did not have buy-in from all stakeholders. Opposition parties were originally skeptical with a lack of confidence in the system. The government at the time allowed and to become a political bone of contention, rather than listening to the rational arguments being presented. They dug in and extended the degree of political commitment to the deeply flawed system.

Clarification of the roles and responsibilities of key players
The contracts with the vendors of the system appear to have been wholly inadequate. They had no legal responsibility to provide a system that was fit for purpose, nor were they liable for the costs incurred due to its critical flaws.

Conclusion
A project of this scale and criticality must be well-specified, well-planned, and supervised by impartial advice from sufficiently knowledgeable experts. Above all, it must be undertaken with caution.

Notes
Any of the documents used with permission through Joe McCarthy’s Freedom of Information records.
E- Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

APPENDIX 7

SPEECH OF SHRI V. S. SAMPATH

CHIEF ELECTION COMMISSIONER OF INDIA

ON

ELECTRONIC VOTING AND COUNTING

IN INDIA

1. It gives me great pleasure to share with you our experience on Electronic Voting and Counting. I intend to take you on an exciting journey which is more than 2

2. The Commission and State of Indian Elections -

Before I give you the details of Electronic Voting and Counting in India, let me first explain the scale and complexity of elections in India. India has a population of approximately 1.3 billion and elections of over 700 million voters.

The size of Indian electorate is greater than that of the electorate of all the countries of Europe taken together. It is greater than all the countries of North and South America taken together and greater than all the countries of the Commonwealth except India.

The 2004 General Elections saw more than 800,000 candidates contesting in 543 Constituencies and 92,000 polling stations. Approximately 11 million polling personnel were deployed in 2004 elections. 159 special teams with 3360 teams were used to transport Central Police Forces. 55 helicopters were employed polling staff in 601 areas. However, it is not just the scale but also the diversity and complexity which make Indian
3. The system of voting in our country has evolved from a very primitive system to electronic voting in the last 50 years. In the first General Elections held in 1951, the separate ballot box was used for each candidate. This was done because it was felt that the votes in India will not be able to understand the process of marking the ballot in the absence of the candidate of their choice. The system of making the ballot paper was introduced for the first time in India in the year 1992. India has used electronic voting in all elections since 1996.

Electronic voting can be of two different types. These are ‘poll of poll’ and ‘Internet’. Internet voting has been tried on a limited scale in some countries like Austria, Canada and the USA. India has also experimented with internet voting in elections to the Municipal Corporation in Gujarat. ‘Poll of poll’ electronic voting using direct recording machines or it can be writing or marking on a paper ballot in the usual manner with optical scanning or it can be voting by marking on a paper ballot in the usual manner with optical scanning for counting of votes. Direct recording voting machines are used in India, Brazil, etc.

4. **Terms of Electronic Voting**

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The concept of Electronic Voting Machines in India was first mooted in 1997 by Shri S. L. Shukla, the then Chief Election Commissioner of India. Electronic Voting Machines with a common voter interface were developed in 2000. These machines were comprehensively tested at locations across the country. Simultaneously, the machines were then tested and manufactured in India. EVMs were used for the first time in India in May, 2002 in 50 polling stations of Pauri Assembly Constituency in Garh. However, before the use of these machines could become widespread, it was challenged in the High Court. On 5th March, 1994, the Supreme Court ruled in the Election Petition that EVMs cannot be used.

The issue was then referred by Government of India to the Election Commission. The Technical Experts Committee was constituted for examining the EVM. The recommendations made by the committee were not accepted by the Government.

The Commission spent approximately six years from 1992-1998 to create awareness about EVMs. Since 1999, EVMs have been used in our country in every General Election and by election. Several election to Lok Sabha, unless of the People's Party in 2004 and 2005 were conducted exclusively on EVMs.

The first and the most important concern was about the possibility of tampering with data in the EVM. The remedy provided for this concern in the Indian EVMs was:
APPENDICES

CHAPTER 7

i. The microprocessor used in the EDHs has software code "hijack".

ii. There is no operating system in the Indian EDHs, all coding is at the chip level.

iii. Indian EDHs are stand-alone machines which cannot be reprogrammed and therefore they cannot be reset or load images remotely.

iv. The second concern was that the data should be stored long enough to track all changes. This has been remedied by using the machine without name power in a normal sense. The data can be retrieved for years even when the power pack battery is removed.

v. EDHs in India have been improved as technology has progressed. The best model of EDHs manufactured in 2005-06 is no longer used. It has been declared obsolete. The Commission has fixed the life of EDHs, to be 15 yrs. A new model
by pressing Ballot button on the Control Unit. The voter then goes to the polling compartment and presses the candidate button on the Ballot Unit for the candidate of his choice. As soon this button is pressed, the vote is recorded in the Control Unit and Ballot Unit goes dead till it is re-enabled by pressing the Ballot button on the Control Unit. However, it cannot be re-enabled within 12 seconds of casting a ballot. When the candidate button is pressed, an LED gets lit up against the name of the candidate whose button has been pressed and a loud beep sound is heard so that a voter knows that his vote has been cast in favour of the candidate of his choice.

9. **Security of EVMs**

EVMs are kept under very strict security. They are stored in strong rooms which have only one door. The door has a double lock system and the keys of the two locks are kept with two different senior officers. The strong room is kept under armed guard 24 hours a day and is also under coverage of CCTV camera. When EVMs are transported from the strong room to the polling stations and back they are always accompanied by armed police guard.

10. **Transparency and involvement of Stakeholders**

The Commission ensures complete transparency and involvement of all stakeholders in the use for EVMs. An elaborate procedure has been prescribed by the Commission for this purpose. It begins with the process of First-Level Check which is done a few months before every election in the presence of representatives of recognized political parties. During First-Level Check engineers of manufacturers check every EVM. After this, a mock poll is conducted by casting one thousand votes in at least 9% of EVMs picked up randomly by representatives of political parties. After the mock poll, a sequential printout of the result is taken and shown to the political party representatives so that they can compare it with the sequence of votes polled during the mock poll. Thereafter, the control unit of EVMs is sealed using a uniquely numbered Pink Paper Seal which is manufactured by Security Printing Press, Nasiik. It may be mentioned here that this Security Printing Press, Nashik also prints currency notes for our country. Political Party representatives sign on the pink paper seal after it is applied on the Control Unit. The Control Unit cannot be opened without damaging the pink paper seal once it is applied. After the candidates are finalized in an election, a similar process of second-level check is done on the Ballot Unit after which the Ballot Units are also sealed using the pink paper seal. Even during this process, mock poll with one thousand votes is done in 9% of EVMs picked up randomly by candidates. A sequential printout is shown to candidates and their representatives. Another mock poll is done by casting at least 50 votes at each polling station before the commencement of the poll. In addition to these measures, several other thread seals and paper seals are put on the Control Unit and Ballot Unit to ensure that they cannot be opened and are 100% secured. Before the process of counting is started, the integrity of the seals is checked in the presence of candidates and their representatives.
11. Judicial Scrutiny of EVMs in India

EVMs in India have not only stood the test of time but have also won over heart. Bombay High Court (Nagpur Bench) and Karnataka High Court, in two election petitions, expressed satisfaction about the non-interchangeability of the EVM-Chip. The Karnataka High Court went on to express that, “the operation of the mechanism of the EVMs is a matter of public concern. It is not a question of introducing any error or bias.” It is further observed that these EVMs have several advantages:

a. They reduce the election process.

b. They are user-friendly and can be used even by illiterate voters.

c. They prevent vote manipulation.

d. There is no scope for invalid votes.

12. Advantages of EVMs:

- They reduce the election process.
- They are user-friendly and can be used even by illiterate voters.
- They prevent vote manipulation.
- There is no scope for invalid votes.
E-Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

- Consolidating and using reservation
- Public Key Infrastructure [PKI] authentication
- Possibility of use in public domain
- Electronic Voting and Counting - make election process faster, simpler and more secure.

At the end, I would like to point out the lessons from the Indian experience:

- Provision must be made in election law before EVMs are used.
- Electronic Voting should be introduced gradually in the country.
- Consultation with all stakeholders is a must.
- Voter education in the use of EVMs is imperative with changing technologies.
Electronic Voting and Counting In India

State-of-the-Art, User Friendly and Tamper Proof

V S Sampath
Chief Election Commissioner of India

Demography and major challenges in Elections in India
The Complexities

- It’s not just size and magnitude.
- It is about the pain taken to ensure the value attached to each vote is honored.
- Democracy even at the remotest locations
- Separate polling station for a lone voter in the Gir Forest of Gujarat
- 12 men trekking 45 km in knee-deep snow to reach a polling stations with 37 voters in Auley Phu at 15,300 ft above MSL in Ladakh

The Complexities.....2

- Using elephants, camels, boats, cycles, helicopters, trains to ferry EVMs and polling teams
- Countrywide ‘vulnerability mapping’
- Tracking information from each polling stations
- Dealing with Regional, Religious, Ethnic, Cultural and Linguistic Diversities
G.E.2009: The Ballot Field

- Number of Parliamentary Constituencies: 543
- Total Candidates: 6070
- Large number of Candidates in each Constituency: 43 (Chennai South PC, Tamilnadu)
- 834,944 Polling Stations (Now there are One Million Polling Stations)
- 11 Million personnel deployed for polls
- 100,000 CPF used in 8 phases of polls
- 110 Special Trains / 3000 coaches for movement of CPF
- 6800 security personnel were airlifted over-flying Bangladesh to avoid delay
- 55 Helicopters used, 601 sorties to take polling staff/ EVM to remote locations and for evacuations in the Maoist Extremism infected areas

Different Types of E-Voting and E-Counting Technologies used in the World
Different Types of E-Voting

- Polling Place E-Voting-
  - Direct Recording Machines (India, Brazil etc.)
  - Direct Recording Machines with VVPAT (Venezuela)
  - Paper ballot with Optical Scanning for Counting (Some States in USA)
- Internet Voting –
  - Tried on a limited scale in some countries e.g. Austria, Canada, USA etc.
  - Tried to a limited scale in India by State Election Commission of Gujarat in Municipal Elections

The Story of Indian Electronic Voting Machine
The Concept

- Idea mooted by Sh. S.L. Shakdhar the Chief Election Commissioner in 1977
- Recommended E-voting to save avoidable and recurring expenditure on printing, storage, transportation and security of Ballot Paper to the exchequer (Approximately 12000 MT of paper will be needed at a total cost of Rs 578,400,000/- in each parliamentary election)

Development of EVM

- Electronics Corporation of India Limited (ECIL) a leading Public Sector Company engaged in the design and manufacture of professional electronics was commissioned to design a machine to prove the feasibility
- Once feasibility was established, Bharat Electronics Limited (BEL) a second Public Sector Company was co-opted into the exercise
Development of EVM

- Both the companies (ECIL & BEL) brought out models with a common User Interface in 1980
- The machines were extensively tried out at locations across the country
- Publicity campaigns were run in the press and other media
- Seminars conducted by Election Commission of India in various forums
- Feedback obtained used to fine-tune the machine

Major Concerns and Remedies

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<th>Concerns</th>
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| Can the data be tampered with? | 1. It incorporates a microprocessor that has ‘burnt-in’ software code which cannot be altered or retrieved  
2. No operating system  
3. No Networking |
| How does the machine operate in remote areas without electric power? | It is independent of mains power and operates on a special power pack (7.5 volts battery) |
| Can the data be stored long enough to be used as evidence in a court of law in case of electoral disputes? | All the data is recorded on non-volatile dual redundant memory chips and can be retained for years even when the power pack is removed |
The Journey of EVMs - 1

- Decision to use EVMs taken in a meeting on 29th July, 1981 with BEL, ECIL, Law Ministry and some of the CEOs
- First used in 50 polling stations of Parur Assembly Constituency of Kerala in May 1982
- On 5th March 1984 the Supreme Court ruled in an election petition that EVMs can not be used in elections unless a specific provision in the law providing for their use is enacted

The Journey of EVMs - 2

- Matter of use of EVMs was referred by the Government of India to Electoral Reforms Committee in February, 1990 consisting of representatives of several recognized National and State parties
- Expert Committee constituted by the GOI, consisting of Prof. S. Sampath, Chairman RAC, DRDO, Prof. P.V. Indiresan, IIT Delhi and Dr C. Rao Kasarabada, Director Electronics Research and Development Centre, Trivandrum. Expert Committee unanimously recommended use of EVMs
The Journey of EVMs -3

The law was amended by Parliament in December, 1988 and a new section 61A was inserted in the Representation of the People Act, 1951 empowering the Commission to use voting machines. The amended provision came into force w.e.f. 15th March, 1989. On 24th March, 1992, necessary amendment to the Conduct of Elections Rules, 1961 was notified by the Government enabling the use of EVMs in elections.

The Journey of EVMs -4

- From 1992 to 1998 Commission created awareness about EVMs by demonstrations and mass media campaigns
- Since, November 1998, EVMs have been used in every general/bye elections
- General Elections to Lok Sabha in 2004 and 2009 were conducted exclusively on EVMs
- Further improvement in technology was brought about in 2006. Features like date and time stamping of all keys pressed and dynamic key coding were added
- New model of EVMs was again evaluated by Expert Committee consisting of Prof. Indiresan, Prof. Shahni and Prof. Agarwal of IIT Delhi. They unanimously recommended the use of modified EVMs
- The Technical Expert Committee has been expanded by including Prof. Rajat Moona DG CDAC and Prof. D K Sharma of IIT Mumbai
EVM – Technology Features

- Masked/OTP microprocessor - Software code can neither be retrieved nor altered (Hex-code burnt into the chip)
- Software developed in-house by BEL/ECIL independently
- No operating system
- Stand alone machine
- No input possible from any source except ballot unit
- Double redundant resilient memory storage for securely retaining data without a backup battery

EVM – Operational Features

- Custom made to fit into procedure of balloting
- Each EVM can cater to a maximum of 64 candidates with 4 Ballot Units cascaded
- Once the close button is pressed the poll is closed and no more balloting can take place
- After a voter casts his/her vote, the machine goes dead till the presiding officer enables the ballot unit again by pressing a button to allow the next voter to vote
Administrative Safeguards-1

- Secure storage, mostly in treasury strong rooms. Polling EVMs are kept in strong rooms which are guarded 24 hours by armed police.
- Candidates and their representatives can put their seals on the locks and are allowed to keep a watch on the strong rooms round the clock.
- First level check of each EVM before every election by the manufacturers.

Administrative Safeguards -1

- At least 1000 votes polled in at least 5% EVMs randomly selected by political parties and candidates during FLC and Candidate Set.
- Sequential Prints of results of these EVMs given to candidates and political parties.
- Security at warehouses – No windows, only one door, double lock system, opened only in the presence of political party representatives after due notice, 24 hours police guard.
E- Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

**Administrative Safeguards**

- EVMs are randomized twice using a computer software in the presence of candidates and their representatives before every election.
- Candidates and their representatives allowed to check as many EVMs as they want at the time of candidate set before the election.
- The exact sequence of candidates in the ballot paper is known only 14 days before the poll as the sequence is in alphabetical order of the names of candidates.

**Administrative Safeguards – Sealing**

- At the time of FLC – Pink paper seal on CU
- At the time of Candidate set—
  - Thread seal for the “Candidate Set” and Power Pack (Battery) Section of Control Unit after setting of number of contesting candidates and installation of battery.
  - Thread seal for Ballot paper screen of Balloting Unit after fixing of ballot paper.
  - Thereafter, two thread seals for Ballot paper cover of Balloting Unit.
  - Pink paper seal on BU
- After mock poll in Polling Station –
  - Green paper seal, signed by polling agents and presiding officer for result section.
  - Thread seal for inner door of result section.
  - Thread seal for Bottom compartment.
  - Thread seal for connector box for cascading Balloting Unit, if any (when there are more than 16 candidates).
Administrative Safeguards – Mock Poll

- Mock poll of 1000 votes in at least 5% EVMs selected by political parties at the time of First Level Check (FLC)
- Mock Poll of 1000 votes in at least 5% EVMs selected by candidates at the time of candidate set
- Mock Poll of 50 votes before the poll in every polling station
- Mock Poll in the polling station if an EVM is changed for any reason before the poll in the new EVM

Administrative Safeguards – Malfunction in EVMs

- The rate of malfunction is very low (0.1%)
- If result is not displayed for some reason it is possible to connect an Auxiliary Display Unit (ADU) to see the result. If this does not work the result can be printed out
- All malfunctioning machines are kept separately. Manufacturers run complete diagnostics on them to determine the cause of malfunction and for future improvements
Process of Polling by EVM

- The voter is identified from the voters’ list and records his presence by a signature or thumb impression in the Register of Voters (Form 17A)

- The Presiding Officer presses the “Ballot” button on the Control Unit enabling the EVM for only one vote

- The voter then proceeds to the polling cubicle and after perusing the ballot paper on the Ballot Unit, presses the key against the candidate of his choice to record his vote

Process of Polling by EVM

- A red lamp glows against the name and symbol of the candidate indicating to the voter that his vote has been cast in favor of the candidate of his choice

- The casting of the vote results in a beep in the Control Unit indicating to the Presiding Officer and polling agents that a vote has been cast

- The EVM goes dead after this. Nothing will happen even if the candidate button is pressed on the ballot unit

- The presiding officer has to enable the ballot unit by pressing the “Ballot” button on the control unit for the next voter. EVM cannot be enabled within 12 seconds of a voter casting vote
Closing the Poll

- The cap on the “Close Button” on the control unit is removed and the button pressed. After this no more votes can be cast in this machine.
- The cap is then replaced.
- The unit is then switched “Off” and the interconnecting cable disconnected.

Counting & Results

- Once the EVM is brought to the counting table all seals are checked to ensure that they are intact.
- After getting ready to note down the result, the green paper seal over RESULT Button is pierced and RESULT Button is pressed.
- The machine first displays the total number of votes cast, and then the votes by each candidate one by one.
- The result is noted by the counting officers and shown to the counting agents.
Scrutiny by Courts -1

Bombay High Court (Nagpur Bench) and Karnataka High Court in two election petitions. Both courts were satisfied about the non-tamperability of the ECI-EVMs. The Karnataka High Court went to the extent of observing “this (ECI-EVM) invention is undoubtedly a great achievement in the electronic and computer technology and a national pride”

Scrutiny by Courts -2

- Kerala High Court has also recorded its appreciation of the efficiency of the mechanism of the ECI-EVMs
- The Madras High Court held that: “There is also no question of introducing any virus or bugs” It further observed “The contention of the learned counsel that the use of EVMs in Japan and United States of America proved to be a failure also will not hold any water. In India, we are not following the system prevailing in the United States of America or Japan”
Advantages

- Modernises the election process
- User friendly – can be used even by illiterates
- Simple to operate and can be installed in a short time
- Preserves voting secrecy
- No scope for invalid votes
- Facilitates quick and accurate counting – possible to declare results instantaneously
- Re-usable by simply erasing votes recorded in earlier poll

Advantages

- Huge expenditure involved in printing, storing and transportation and security of ballot paper can be avoided (Approximately 12000 MT of paper will be needed at a total cost of Rs 578,400,000/- in each parliamentary election)
  - Low operating costs
  - Easy to manage with less demand on man-power
Advantages

- Environment Friendly –
  - If Election is held in the entire country using ballot paper then 12,000 MT of paper will be needed
  - One MT of paper requires felling of 24 full grown trees so we save 282,240 trees in every election by using EVMs
  - One MT of paper needs 680 liters of water so we save 8,160,000 liters of water in every election

Future Plans - VVPAT

Manufacturers of EVMs have developed a prototype VVPAT with thermal paper printers to be used with EVMs. The prototype was tested in five places in the field in July 2011 and 2012. Several improvements have been made since then and ECI has now decided to use EVMs with VVPAT in a Bye-election
Future Plans – New model of EVM

Manufacturers are working on developing a new model of EVM which will have additional features like –

- Code verification and unit authentication
- Public Key Infrastructure (PKI) authentication
- Possibility of code in public domain
- Integrated VVPAT
- Confirmation of choice of vote by the voter
- Possibility of larger number of candidates

Lessons from the Indian Experience

- Electronic Voting and Counting makes election process faster, simpler and tamper-proof
- Provision must be made in election law before EVMs are used
- Electronic Voting should be introduced gradually in the country
- Consultation with all stakeholders is a must
- Voter education in the use of EVMs is desirable
- Continuous improvement is necessary with changing technology
Sub-Units of EVM

Interconnecting Cable

Control Unit

Ballot Unit

Ballot Unit - Details

Ready Lamp
Slide Switch Window
Candidate’s Button

Candidate’s Lamp

Ballot Paper Screen
Control Unit - View of Bottom Compartment

Control Unit - Display Section
Control Unit - Ballot Section

Total button

Thank You
APPENDIX 9

Country Case Study — The Philippines

e-Voting: an enabler or disabler to strengthening electoral democracy?

11-13 March 2013

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E-Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

The system used by the Philippine government for the May 13, 2013 election is an example of how technology can be integrated into the electoral process. The system is designed to enhance transparency and reduce the risk of fraud. The system uses an electronic voting machine (EVM) to allow voters to cast their ballots electronically. The system also includes a biometric authentication system to verify the identity of the voter. This helps to prevent voter fraud and ensures that only registered voters can cast their ballots. The system is also designed to be secure, with strong encryption and other security measures to prevent unauthorized access to the voter data. Overall, the use of technology in the electoral process can help to enhance the integrity of the election and ensure that the results accurately reflect the will of the people.
The long and winding legal journey toward automating Philippine elections officially commenced on 7 June 1995 when Republic Act No. 8046 was enacted into law. This legislation authorized the Commission on Elections (COMELEC) to conduct a nationwide demonstration of an automated election system. The first ever experiment on automated elections in the Philippines was held in the Ilocos on 9 September 1996. Congress subsequently enacted R.A. No. 8436 on 21 December 1997 authorizing the COMELEC to automate the national and local elections of 11 May 1998 and succeeding ones. Because of the limited time to prepare for a nationwide automated election, automation was limited again to the ARMM region. Because of the failure of the automated counting machines to read the ballots correctly in many municipalities in Sulu province in the ARMM, the ballots were counted manually.

While the COMELEC had authority under R.A. No. 8436 to automate the 2000 national and local elections, Congress failed to appropriate the budget needed for its implementation. COMELEC was not able to carry out automated elections in 2004 either. Even with an appropriation for the automation of the 2004 national and local elections, the Supreme Court declared it null and void and voided the contract between the Commission and Mega Pacific, who won the bid to supply the machines.

On 23 January 2007, Congress passed R.A. No. 9369 amending R.A. No. 8436. Among other things, the amendatory law authorized anew the COMELEC to implement an automated election system (AES). In August 2008, the COMELEC automated the regional polls in the ARMM, using direct recording electronic (DRE) technology in the province of Maguindanao and the optical mark reading (OMR) system technology with a central count in the other four provinces of the ARMM.

By the end of 2008, more than 13 years after the passage of the original legislation allowing for election automation, these pilots had been implemented – all in the 5 provinces of the ARMM either during regional or national elections. While this perhaps seems like an agonizingly protracted timeline, what it did do was provide for pilot testing of several different types of election automation. According to FES e-voting technology expert Ike Goldsmith, “Before any final decision can be made about the possible use of electronic voting and counting technologies it is essential that the technology be piloted.” Lessons learned from these limited efforts informed decision-making regarding technology choices for the first nationwide election finally conducted in May 2010.

During the 1 September 2008 hearing of the joint Congressional Oversight Committee (COOC), then-Chairman Senator Richard J. Gordon encouraged COMELEC and the COMELEC Advisory Council (CAC) to pursue a vendor fair to expose the Philippine electorate to a wider selection of equipment and technical solutions. Subsequently, in the first week of September, the CAC approached FES to organize this event given our extensive experience in working with election commissions on technology issues and holding similar vendor fairs in the past.

FES launched the Election Technology Conference and Vendor Exhibition Vendor Fair in November 2008, a week before the CAC deadline for submitting its recommendations to COMELEC on selection of technology. Over the course of three days, 200 conference attendees viewed the latest election equipment and supplies from 17 international vendors representing 9 countries, as well as local election supply vendors. The double objective of the event was not only to expose Philippine stakeholders to the latest selection of equipment and technical solutions for elections, but also to provide a forum to discuss lessons learned from other countries and identify potential pitfalls before pursuing such an enormous undertaking as nationwide automation. Participants listened to presentations on international standards in the application of technology to electoral processes from FES’ leading experts on election administration and management and engaged in discussions on how this related to the Philippine context.

Based on the experience in automating the ARMM elections in 2008, and upon the recommendation of its advisory council, the COMELEC decided to utilize the paper-based Precinct Count Optical Scan (PCOS) system that requires voters to fill out paper ballots and feed them into a scanner that counts the votes automatically. The same machine then transmits the precinct results electronically after the close of polls from the polling center directly.

On 31 March 2009, Congress enacted R.A. No. 9525 and appropriated PhP 11,360,790,000 (US$ 212,205,649.57 / JAR 2,008,355,830.12) for the May 2010 national and local elections, the COMELEC finally had all of the necessary ingredients to move forward with automating a nationwide election, including a legal framework, budget and sufficient time.

On 10 July 2009, the COMELEC and DARAFMATIC-FIDJ entered into a contract for the provision of an AES for the May 2010 elections. The contract provided for the automation of the counting, transmission and canvassing of votes, with systems integration and overall project management included. It contained three components consisting of a Paper-Based AES, which consists of an Election Management System (EMS), a PCOS System and a CES (Canvassing and Consolidation System). The 2nd and 3rd components are the provision of Electronic Transmission of Election Results using Public Telecommunications Network and Overall Project Management. The COMELEC designated a PMO as its implementing unit, borrowing staff from existing pools to fulfill these nine tasks. Training and capacity building now becomes an enormous undertaking for this type of change management exercise.
The chapter discusses the importance of accurate and efficient systems in the context of election processes. It highlights the need for streamlined and transparent systems to ensure the integrity of the electoral process. The text elaborates on the role of technology in facilitating these systems, ensuring that the results are not only accurate but also easily verifiable. The chapter emphasizes the reliance on technological advancements to enhance the efficiency and accuracy of the election process.

The text further delves into the specifics of the system, detailing the mechanisms and procedures in place to maintain the security and reliability of the electoral process. It mentions the implementation of automatic counting and verification systems to eliminate human error and ensure that the results are reflective of the true intentions of the electorate. The chapter concludes by stressing the importance of continuous improvement and adaptation of these systems to meet the evolving needs of the electoral process.
E-Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

...
APPENDICES

CHAPTER 7

When calculating a requirement for mission critical resources it is important to estimate the number of users or workstations that will be accessing the system. This is particularly true when planning for the installation of new equipment.

One of the key factors affecting the overall capacity of the system is the number of users or workstations that will be accessing the system. This is particularly true when planning for the installation of new equipment.

The result of this decision was that the number of users or workstations that will be accessing the system is to be increased. This decision was made for a number of reasons:

1. The number of users or workstations that will be accessing the system is likely to increase over time as the system is used.
2. The number of users or workstations that will be accessing the system is likely to increase as new equipment is installed.
3. The number of users or workstations that will be accessing the system is likely to increase as the system is used.

Although this decision has been made, it is important to note that the system is not designed to handle the maximum number of users or workstations that will be accessing the system.

The NCSC have also considered the potential for the number of users or workstations that will be accessing the system to increase. The NCSC have determined that the number of users or workstations that will be accessing the system is unlikely to increase beyond the maximum number that the system is designed to handle.
E- Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

Future Outlook

Despite the technical shortcomings just reviewed, seventy-five percent of Filipinos were satisfied with the general conduct of the May 2010 automated elections, according to the Second Quarter 2010 Social Weather Survey conducted from 31 to 28 June 2010. The survey also found that Filipinos were satisfied with how the COMELEC and other institutions handled various aspects of the May 2010 elections. In addition, a complementary survey of 486 poll workers nationwide who served in the May 2010 elections showed that they are even more satisfied with the conduct of the May 2010 elections compared to the general public. COMELEC officials are also confident of the use of PDS for the upcoming elections. This may be partly due to the existence of a paper trail as a back-up in case of system failure, as well as the fact that voters still have a paper ballot interface which increases their trust and confidence in the process.

Ensuring transparency in the preparations for an electoral exercise will go a long way in regaining the public’s trust, confidence and support. The requirements of transparency cannot be dispensed with for expediency purposes. Transparency, being a crucial factor in creating voter confidence in the voting system, and in consequence, in that of the elected representative’s legitimacy, must be constantly honed over other considerations. It allows the detection of structural and operational defects and of some threats to the election process or the voters themselves (fraud, intimidation) that could alter the results.

Institutional capacity building for COMELEC, and possible reorganization, should be continued through implementation of their strategic plan dubbed COMSAP(3), which will run through the 2010 Presidential Elections. This particularly applies to the IT department and encompasses modern project management skills for the entire Commission, both at HQ and field office level.

Finally, there will be the need for a post-election assessment in 2010 and a decision on whether to use the same PDS machine for the third time, or invest in a new system for the 2010 Presidential elections. This may hinge on the results of the upcoming election implementation in May.

Summary

A summary of key lessons is provided below for consideration by those EMBs considering automating their election process.

- Define a core need for targeted implementation of technology, i.e. canvassing and results transmission.
- Ensure legal framework, budget, timeline and political will are in place.
- Safeguard procurement processes that are clean and transparent.
- Conduct pilot testing and vendor fairs and have a strong public relations and media strategy.
- Prioritize voter education and poll worker training.
- Invest in capacity building for all election stakeholders, including EMB staff, civil society, judiciary, media, and security agencies.
- Adjust for new timelines that require major changes in the former process.
- Design contingency measures to mitigate unintended consequences of automation.
- Implement a timely random manual audit on election night.

Enabled or Disabled?

In the Philippines case study of the 2010 elections, automation served its purpose by providing speedy and accurate results that raised the credibility of the electoral process. However, a wide margin in the Presidential race resulted in a lower level of scrutiny during the days immediately following the elections. COMELEC cannot count on this scenario repeating itself for the national elections in 2013 and therefore needs to ensure that transparency through a robust random manual audit process is properly implemented. Otherwise, there is a real danger that a lack of transparency will result in the eventual loss of credibility in the automated system.

Whether looking at international standards or a commissioner’s own defined values, such as those we have here from South Africa’s own EIC, keeping these standards in mind while determining whether or not to automate will help guide decision-making. These values are the same under a manual or automated system and should always be the guiding principles. Not all standards will be equally prioritized under different systems, so weighing the costs and benefits side by side, as to what you gain or lose for each value needs to be done carefully and keeping the local context in mind. As IIFS we like to say, there is no blueprint for democracy, and nowhere is that more true than in the application of technology to electoral processes.
Country Case Study
Philippines

Population:

- 94.9 million people in 2011 from 27.1 million in 1960, changing 251 percent during the last 50 years.

- Voting population: 52,014,648 voters
Geography:

- An archipelago comprising of 7,107 islands with a total land area of 300,000 km².
- The islands are divided into three groups: Luzon, Visayas, and Mindanao.

Geography:

- A hierarchy of local government units (LGUs) with the 80 provinces as the primary unit.
- The barangay is the smallest local government unit.
• Divided into 17 regions with all provinces grouped into one of 16 regions for administrative convenience.

• The National Capital Region however, is divided into four special districts.

• Most government offices establish regional offices.

• The regions themselves do not possess a separate local government, with the exception of the Autonomous Region in Muslim Mindanao.
Description of Government Structure:

- Chief of State and Head of Government: 
  President Benigno Simeon AQUINO III

- Assembly: Philippines has a bicameral Congress consisting of the Senate with 24 seats and the House of Representatives with 287 seats.

Description of Electoral System:

- The President is elected by plurality vote to serve a 6-year term.

- In the Senate 24 members are elected by plurality vote in multi-member constituencies to serve 6-year terms.*
Description of Electoral System:

- In the House of Representatives, 230 members are elected by plurality vote in single-member constituencies to serve 3-year terms and 57 members are elected through a closed-list proportional representation system to serve 3-year terms.**

Future Elections:

- Presidential - May 2016
- Legislative - May 13, 2013
Characteristics as a Democracy

IFES CEPPS 2004 Report

• Overwhelming majority of its participants showed resiliency and a commitment to democracy.

• There was substantial voter interest and turnout

Social Characteristics

○ The patron-client relationship
○ Losing face
○ Poverty and self-enrichment
○ Financial and political corruption
Characteristics as a Democracy

IFES CEPPS 2004 Report

• These social underpinnings are inter-linked

• These social characteristics are an important part of the context

Description of the type of e-voting/counting technology
Characteristics as a Democracy

- On 7 June 1995, R. A. No. 8046 was enacted into law
- 9 September 1996.
- Congress subsequently enacted R. A. No. 8436 on 22 December 1997
- Ballots were counted manually.

Characteristics as a Democracy

- While the COMELEC had authority under R.A. No. 8436 to automate the 2001 national and local elections, Congress failed to appropriate the budget needed for its implementation.
E-Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

Characteristics as a Democracy

- COMELEC was not able to carry out automated elections on 2004.


- In August 2008, the COMELEC managed to automate the regional polls in the ARMM.

Characteristics as a Democracy

Type of Voting Technology

- COMELEC decided to utilize the paper-based PCOS system.

- On 23 March 2009, Congress enacted R. A. No. 9525 and appropriated PHP 11,301,790,000 ($233,228,569.07) for the May 2010 national and local elections.
On 10 July 2009, the COMELEC and SMARTMATIC-TIM entered into a contract,

There were around 82,000 PCOS machines used in the 2010 polls.
The same election technology will be used for the 2013 midterm and ARMM regional elections.

COMELEC and SMARTMATIC-TIM entered into a contract on 30 March 2012.
E-VOTING: AN ENABLER OR DISABLER TO STRENGTHENING ELECTORAL DEMOCRACY?

Characteristics as a democracy

Electronic Transmission

Source: COMELEC

Characteristics as a Democracy

Description of the main reasons for deciding to migrate to e-voting/counting technologies in Philippines
• The Philippines infused automation into an environment where electoral legitimacy has been frequently questioned and criticized.

• The Achilles’ heel of Philippine elections has always been the dual challenge of speed and fraud prevention.

• In the past, counting ballots often took days, with weeks or even months until the results were tabulated.

“...an automated election system...will ensure the secrecy and sanctity of the ballot and all election, consolidation and transmission documents in order that the process shall be transparent and credible and that the results shall be fast, accurate [emphasis added] and reflective of the genuine will of the people.”
Characteristics as a Democracy

IFES 2010 Elections Assessment Report

• Faster vote counting and tabulation was intended to shorten the perceived power vacuum

• Decrease opportunities for erroneous counting, whether deliberate or accidental, by eliminating the subjective factor.

Characteristics as a Democracy

Vendor Fair

• On September 2008 Chairman Senator Richard J. Gordon encouraged COMELEC and the COMELEC Advisory Council (CAC) to pursue a vendor fair

• To expose the Philippine electorate to a wider selection of equipment and technical solutions, an activity IFES had been proposing since 2005.
• IFES launched the Election Technology Conference and Vendor Exhibition (ETCVE)/Vendor Fair from 17 to 19 November 2008

• Over three days, 253 conference attendees viewed the latest election equipment and supplies from 17 international vendors representing 9 countries as well as local election supply vendors.

• The vendor fair provided an important venue for lively and productive discussions

• Helped to identify the pitfalls and dangers presented by automation
Description of the monetary costs of e-voting/counting

- Summary of COMELEC Budget for the May 2010 national and local elections (Source: Presentation by the Commission on Elections to the Members of the House of Representatives February 9, 2009)
### Characteristics as a Democracy

<table>
<thead>
<tr>
<th>ITEM</th>
<th>COST</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase cost per unit for PCDS</td>
<td>145,867.00 ($3,000.15)</td>
<td>PHP 48.62 per USS</td>
</tr>
<tr>
<td>Total purchase cost for PCDS</td>
<td>11,660,400,000.00 ($2,040,012,340.60)</td>
<td>For 80,000 units</td>
</tr>
<tr>
<td>Cost of Lease</td>
<td>8,168,580,000.00 ($1,668,008,656.42)</td>
<td>70% of purchase cost</td>
</tr>
<tr>
<td>Cost of Services</td>
<td>1,555,038,400.00 ($311,981,312.95)</td>
<td>10% of the cost for lease</td>
</tr>
<tr>
<td>Canvassing Units</td>
<td>200,000,000.00 ($4,013,513.52)</td>
<td>For use by the National, Provincial, City and Municipal Boards of Canvassers</td>
</tr>
<tr>
<td>Cost of ballot paper</td>
<td>1,000,000,000.00 ($19,987,687.62)</td>
<td>PHP 20 per ballot</td>
</tr>
<tr>
<td>Transmission Cost</td>
<td>200,000,000.00 ($4,013,513.52)</td>
<td>Use of Public Telecommunications Networks</td>
</tr>
<tr>
<td>Project Management Cost</td>
<td>160,000,000.00 ($32,056,766.76)</td>
<td></td>
</tr>
<tr>
<td>Ballot Box</td>
<td>78,139,000.00 ($15,607,724.37)</td>
<td>PHP 977.125 per ballot box</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>11,301,396,400.00</strong> ($2,232,451,427.05)</td>
<td></td>
</tr>
</tbody>
</table>

### Characteristics as a Democracy

Description of the transition/migration from traditional voting methods to e-voting/counting technologies
An analysis of the key lessons learn from the experience of the Philippines of e-voting/counting technologies

- Most of the issues that have been raised in relation to the AES are tied not to the machines, but errors in human decisions and failure to adequately define and adhere to sometimes complex procedural requirements.
Characteristics as a Democracy

IFES 2010 Elections Assessment Report

System Certification

• SysTest labs review very thorough
• Slow delivery of source code
• List of standards imposed after contract with SMARTMATIC had been signed
• Significant amount of “minor” deficiencies
• Issues could be reconciled with “appropriate manual processes”
• Accountability remains with COMELEC

Characteristics as a Democracy

IFES 2010 Elections Assessment Report

Source Code Review

• Security argument of conducting fully open source code review relevant
• Opportunities provided were too limited to fulfill the transparency requirement
• Compromise required
Characteristics as a Democracy

IFES 2010 Elections Assessment Report

Ballot Printing

• Delay in start of printing
• Miscalculation of number of printers required
• Failure of COMELEC lines of communication
  o Need to establish who has final authority in ballot production
  o Leave ample room for errors and delays

Characteristics as a Democracy

IFES 2010 Elections Assessment Report

Ultraviolet Mark

• While other levels of security existed, turning off UV reader sacrificed (paid-for) level of security
• Perceived vs. real shortcoming
• Hand held scanners were rarely used
• “Left door unlocked because the alarm system was turned on”
CHAPTER 7
APPENDICES

Characteristics as a Democracy

IFES 2010 Elections Assessment Report

Open Console Port

• Major Security Flaw
• Needs to be fixed before future elections
• “Absolute security in technology is impossible”
• Greater importance of RMA – “security by detection”

Compact Flash Cards

• Problem of late ballot design modification
• Insufficient quality management/control
  o Task separate unit with quality control
  o End-to-end testing needs to take place as soon as first batch of real ballots is printed
Philippines and the future of e-voting/counting?

• Seventy-five percent of Filipinos are *satisfied* with the general conduct of the May 2010 automated elections

• The survey also found that Filipinos are satisfied with how the COMELEC and other institutions have handled various aspects of the May 10, 2010 elections.
• Poll Workers are even more satisfied with the conduct of the May 2010 elections compared to the general public.

• EMB officials (including Chairman Brillantes) are confident of the use of PCOS for the upcoming elections

• PCOS is said to be more acceptable as it provides paper trail

• PCOS cost lower than DRE

• Ballot paper interface
Characteristics as a Democracy

- Future gaps
  - Ensuring transparency in the preparations for an electoral exercise
  - Transparency, being a crucial factor in creating voter confidence in the voting system

- Future gaps
  - Institutional capacity building for COMELEC, possible reorganization
    - COMELEC Strategic Plan 2011-2016, Pillar (Technological Capacity):
    - To enhance the capability of the COMELEC to support the conduct of modernized, efficient, transparent, speedy and credible elections.
    - To strengthen the information and communications technology (ICT)-capable personnel in their pursuit of supporting modernized elections.
Characteristics as a Democracy

• Future gaps
  o Investing in new machines for 2016 (Use SMARTMATIC PCOS for the third time or bid for new PCOS?)

THANK YOU!
Seminar on Electronic Voting and Counting Technologies

Brazilian Electoral Justice

- Superior Electoral Court
- 27 Regional Electoral Courts
- 138,544,348 voters
- 5,568 municipalities
- 3,033 electoral zones
- 96,116 polling stations
- 437,443 precincts

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Brazilian Elections

In Brazil, there are elections every two years.

Municipal elections Mayors and City Councilors
... 2008, 2010 ...

General Elections President, Governors, Senators and Federal, State and District Representatives
... 2012, 2014 ...
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Brazilian Electoral Justice

The Electoral Justice is in charge of three distinct functions:

- Legislative
- Jurisdictional
- Executive

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Legislative Activities

1. Preparation of the Internal Rules.
2. Preparation of Regulations
   In the 2012 Elections TSE laid down 14 Resolutions on, for example:
   - Electoral propaganda
   - Money collection and accountability of campaign expenses
   - Preparatory acts
   - Candidatures register.
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Jurisdictional Activities

In 2012:

- 481,776 requests of candidacy register.
  - 31,982 for mayor/vice-mayor;
  - 449,784 for city councilor.
- 10,411 lawsuits judged by TSE
  - 9,189 cases related to the 2012 Elections.

Legal cases judged by TSE - 2012

Other Elections

2012 Elections

88%

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Jurisdictional Activities

Human resources:

- 7 Justices of the TSE
- 196 judges in the TREs
- 3,028 electoral judges, and
- 25,259 public servants

2010

72,000 – legal cases judged

2011

40,500 – legal cases judged (non-electoral year)
Executive Activities

Main questions related to the elections:
1. Private lines for data transmission
2. Procurement and logistics of the electronic voting machines
   a) 500,000 electronic voting machines
   b) 96,000 polling stations in Brazil and abroad
3. Development of more than 50 electoral software
4. Calling and training of polling workers
   a) 1,695,971 total poll workers
   b) 428,946 volunteers
   c) 1,267,025 called up
5. Maintenance of the electoral register
   a) 140,646,446 voters
6. Institutional campaigns
7. Press centre

R$ 395,270,694 spent for doing the elections, what represents a cost of R$ 2,81 per elector.
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Executive Activities

Important partnerships:
- Press
- Armed Forces
- National Agency of Telecommunications
- National Agency of Electricity
- State Secretaries of Public Security
- Federal Audit Court

Seminar on Electronic Voting and Counting Technologies

2012 Elections - 1st Round – 07/10/2012

Results
- 0.55% voting machines replaced
- 2 precincts with manual voting
- 115,807,514 presented to vote (84.59%)
- 5,518 mayors elected
- 57,424 city councilors
- End of counting at 01:48:30, on 08/10/2012
- 197,278,311 accesses to the TSE website, from 167 countries, besides Brazil
- Access peak at 18h50, with around 15,000 accesses per second.
E- Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

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2012 Elections - 2º Round – 28/10/2012

Results
- 0.35% voting machines replaced
- No manual voting
- 25,661,378 presented to vote (80.88%)
- 50 mayors elected
- End of counting at 21:51:51 on 28/10/2012

Perspectives

A. Biometrics

B. Technological updating
- Voting in transit
- Voting abroad

C. Electronic judicial process

D. Improvement of the electoral system

In 2012 Elections, 7,803,050 electors could vote using biometrics in 298 municipalities in 24 states.
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The secret...

One of the secrets to successful elections is the complicity of the Brazilian people.

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Electronic Ballot Box

The electronic ballot box is a microcomputer specifically built for the election process, with the following features: resistant, with small dimensions, light, with power autonomy and security resources.

Two terminals integrate the electronic ballot box: the poll worker terminal, where the voter is identified and authorised to vote (in some models of electronic ballot box, this identification is through a biometric system), and the voter terminal, where the vote is numerically registered.
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Adoption of the Computerised Vote

The computerised process of the Brazilian Electoral Justice was initiated in 1986, when the single computerised register of the voters was defined and created through the voters’ national re-registration.

The first vote via electronic ballot boxes in Brazil was in 1996 and, in 2010, more than 134-million voters participated in the entirely computerised general elections.

Both the hardware and software used in the electronic system of voting are made and assembled under the supervision of the Superior Electoral Court.

In the adoption of the computerised vote, we sought:

- Observance of the Legislation
- Padronisation
- Friendly process
- Reduced costs
- Perennial
- Security
- Logistics
- Autonomy
E- Voting: An Enabler or Disable to Strengthening Electoral Democracy?
Seminar on Electronic Voting and Counting Technologies

The Electoral Process in Brazil - 2012 elections data

Population: 193,946,886 inhabitants in July 2012

- Electorate: 140,646,446
- Electoral zones: 3,3033
- Municipalities: 5,730
- Electoral precincts: 431,185
- Candidates: 481,775
- Electoral workers: 1,695,971 (428,946 volunteers)
- Political parties: 30
- Electronic ballot boxes: 467,163

Seminar on Electronic Voting and Counting Technologies

Electoral Logistics

Brazil’s geographic area: 8,547,403.5 km²
E-Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

Seminar on Electronic Voting and Counting Technologies

Electoral Logistics

Brazil’s geographic area: 8,547,403.5 km²
Seminar on Electronic Voting and Counting Technologies

Electoral Logistics

Brazil’s geographic area: 8,547,403.5 km²

Ballot box replacement
1st round of elections

<table>
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<tr>
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<td>138,544,348</td>
<td>431,185</td>
<td>407,551</td>
<td>2,528</td>
<td>57,084</td>
<td>2,273</td>
<td>0,55%</td>
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Ballot box replacement
2nd round of elections

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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>31,725,967</td>
<td>88,285</td>
<td>86,187</td>
<td>-</td>
<td>8,815</td>
<td>303</td>
<td>0,35%</td>
<td>0</td>
<td>0,000%</td>
</tr>
</tbody>
</table>
The security of the electronic voting system exists in layers. Through safety devices of different types and purposes, several barriers are created which together guard against the hacking of the whole system.

To sum up, any hacking of the system would cause a ripple effect and the electronic ballot box would no longer work, making it impossible to generate valid results.
Seminar on Electronic Voting and Counting Technologies

Public Safety Tests

Aiming to contribute to the improvement of the electronic ballot box’s software and/or hardware, and demonstrating the transparency of the system, the TSE has already held two editions of the Public Safety Tests of the Electronic Voting System, in which enrolled investigators had shown and executed hacking plans to the external and internal components of the ballot box.

The first round of testing was held from 10 to 13 November 2009. None of the tests succeeded in violating the ballot box or the programmes being tested. However, the tests did contribute to the technological improvement of voting.

The second round of tests was held from 20 to 22 March 2012, presenting basically the same results as the first round.

Seminar on Electronic Voting and Counting Technologies

System monitoring

To the political parties inspectors, to the Brazilian Bar Association and to the Public Prosecutor is guaranteed early access to the computer programs developed by the Superior Electoral Court or under its order to be used on elections, with the purpose of monitoring and auditing.
Since its adoption, the electronic voting system has undergone several audits and expertise.

In 2002, the University of Campinas testified that "the electronic voting system fulfills the fundamental requirements of the electoral process".

In 2008, the Federal Police, on a technical report about the 2008 municipal elections in Caxias (MA), dismissed suspicions of possible fraud in the electronic voting system.

Parallel voting is another mechanism adopted by the Electoral Court to confirm the credibility of the electronic voting system.

All Regional Electoral Courts, on the eve of the election, held a public hearing to set the electoral sections that will give in ballot boxes to test through parallel voting.

In parallel voting, the contents of the ballots, already filled up, are typed in the ballot boxes drawn.

At the end, the results of the bulletin of the electronic ballot boxes are compared with those obtained in the reports issued by the support system to achieve parallel voting.

Parallel voting is verified by an auditing company and all the jobs are recorded.
Description: Collection through the updating of information such as the fingerprints and photo of the voter.

Benefits: Ensuring greater reliability and transparency to the process of voting and counting of the electronic ballot box.

Goal: To implement mechanisms that inhibit possible fraudulent acts in the process of voter identification, through the recognition of the holder from their fingerprint and, if necessary, their photograph.

### Biometric Identification of the Voter (2012)

<table>
<thead>
<tr>
<th>UF</th>
<th>% Eleitores com Identificação Biométrica</th>
<th>% Eleitores sem Identificação Biométrica</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>95.8%</td>
<td>4.2%</td>
</tr>
<tr>
<td>AL</td>
<td>94.7%</td>
<td>5.3%</td>
</tr>
<tr>
<td>AP</td>
<td>4.7%</td>
<td>95.3%</td>
</tr>
<tr>
<td>BA</td>
<td>25.8%</td>
<td>74.2%</td>
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<tr>
<td>BS</td>
<td>25.8%</td>
<td>74.2%</td>
</tr>
<tr>
<td>CE</td>
<td>88.6%</td>
<td>11.4%</td>
</tr>
<tr>
<td>DF</td>
<td>11.4%</td>
<td>88.6%</td>
</tr>
<tr>
<td>GO</td>
<td>77.8%</td>
<td>22.2%</td>
</tr>
<tr>
<td>MG</td>
<td>22.2%</td>
<td>77.8%</td>
</tr>
<tr>
<td>PR</td>
<td>36.9%</td>
<td>63.1%</td>
</tr>
<tr>
<td>RJ</td>
<td>54.2%</td>
<td>45.8%</td>
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<tr>
<td>RO</td>
<td>63.7%</td>
<td>36.3%</td>
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<tr>
<td>RN</td>
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<tr>
<td>RS</td>
<td>57.9%</td>
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<td>SC</td>
<td>42.1%</td>
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<tr>
<td>SE</td>
<td>72.6%</td>
<td>27.4%</td>
</tr>
<tr>
<td>TO</td>
<td>27.4%</td>
<td>72.6%</td>
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<tr>
<td>TOTAL</td>
<td>67.1%</td>
<td>32.9%</td>
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</table>
### Costs of Electronic System

**ELEIÇÕES - 2002 A 2012**

<table>
<thead>
<tr>
<th>EXERCÍCIO</th>
<th>GRUPO DE DESPESA</th>
<th>VALORES EMPENHADOS¹</th>
<th>ATUALIZAÇÃO E MANUTENÇÃO DO SISTEMA DE VOTAÇÃO E APURAÇÃO</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>PESSOAL</td>
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<tr>
<td>3 - OUTRAS DESPESAS CORRENTES</td>
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<tr>
<td>4 - INVESTIMENTOS</td>
<td>19.900.706</td>
<td>12.319.412</td>
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<tr>
<td>TOTAL</td>
<td></td>
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<td>105.810.071</td>
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<tr>
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<td>TOTAL</td>
<td></td>
<td>4.262.609</td>
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<td>4 - INVESTIMENTOS</td>
<td>65.930.657</td>
<td>109.405.533</td>
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<td>362.065.441</td>
<td>186.653.372</td>
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<td>2006</td>
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<tr>
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<td>9.745.191</td>
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<tr>
<td>TOTAL</td>
<td></td>
<td>200.542.941</td>
<td>14.989.088</td>
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</tbody>
</table>

¹ Em Reais
### Costs of Electronic System

#### ELEIÇÕES - 2002 A 2012

<table>
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<tr>
<th>EXERCÍCIO</th>
<th>GRUPO DE DESPESA</th>
<th>VALORES EMPENHADOS (Em/Reais)</th>
<th>ATUALIZAÇÃO E MANUTENÇÃO DO SISTEMA DE VOTAÇÃO E APURAÇÃO</th>
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<tbody>
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<td>118.988.184</td>
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<td>-</td>
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<td></td>
<td>3 - OUTRAS DESPESAS CORRENTES</td>
<td>4.846.702</td>
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<tr>
<td></td>
<td>4 - INVESTIMENTOS</td>
<td>-</td>
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<tr>
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<td>TOTAL</td>
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<td>4 - INVESTIMENTOS</td>
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<td>385.268.301</td>
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<td>2009</td>
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<td></td>
<td>3 - OUTRAS DESPESAS CORRENTES</td>
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<td></td>
<td>TOTAL</td>
<td>3.188.286</td>
<td>224.340.152</td>
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</table>

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### Costs of Electronic System

#### ELEIÇÕES - 2002 A 2012

<table>
<thead>
<tr>
<th>EXERCÍCIO</th>
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<th>VALORES EMPENHADOS (Em/Reais)</th>
<th>ATUALIZAÇÃO E MANUTENÇÃO DO SISTEMA DE VOTAÇÃO E APURAÇÃO</th>
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<td></td>
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<td>6.190.653</td>
<td>179.657.434</td>
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<td>TOTAL</td>
<td>468.593.907</td>
<td>264.993.173</td>
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<td>2011</td>
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<td>TOTAL</td>
<td>483.663.551</td>
<td>116.269.714</td>
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</tbody>
</table>

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**Notes:**

- *Alguns valores descartados para formar o total de despesas para os anos de eleição.*
Currently, the Electoral Court has around 500 thousand electronic ballot boxes to hold elections all over the country.

The lifespan of the electronic ballot boxes is 10 years.
Seminar on Electronic Voting and Counting Technologies

The success of the electoral process

"Brazil was the first nation in the world to have a fully digital election, and that way will be recognized by historians in the future."

"The Electoral Justice is the most trusted institution in the country, attests the survey after the 2006 elections."

"[...] 97.7% of respondents approve of the electronic ballot box."

Seminar on Electronic Voting and Counting Technologies

The success of the electoral process

"[...] the system that is enshrined in terms of agility and also to preserve the will of the voters, the exercise of an inherent right to citizenship that is the right to choose representatives.

It is unimaginable, even in other cultures, to obtain a result considering that universe of voters in such a short period of time and with the utmost security."

Minister Marco Aurélio
(10.9.2012)
Key lessons from the international experience of e-voting

Types of e-voting systems
Advantages/disadvantages
The E-voting pyramid of trust
Recommendations

IEC of South Africa Seminar on e-Voting
Cape Town, 11-12 March 2013
Peter Wolf
International IDEA

Types of E-Voting Systems

Voting Machines
Internet Voting
Key Differences

Voting Machines
- Controlled Environment
- Only Voting Channel

Internet Voting
- Uncontrolled Environment
- Additional Voting Channel

Types of Voting Machines
- PCOS/ Ballot Scanning
- DRE/ Direct-Recording Electronic
Voting Machines, Options

Paper Trails
Physical Evidence
Certification

Types of E-Voting Systems

Electronic Ballot Printers
Types of E-Voting Systems

The Indian Voting Machine

E-Voting Systems, Options

Access to Source Codes
E-Voting Systems, Options

Voter Authentication
- Electronic Poll Books

Examples of Major E-Voting Experiences

Internet: Estonia, Norway, Switzerland, Canada

Voting Machines:
US, Brazil, Venezuela, India, Philippines,
France, Belgium, Spain, Peru
Some Trends

- Feasibility studies, piloting and testing in many countries
- Paper trail & Ballot scanners
- Europe: Internet voting more than Voting Machines, Very gradual, reluctant implementations

Potential Benefits of E-Voting

- More Automation – Less Human Intervention
  - Faster availability of results
  - Elimination of human error and related inaccuracies
  - Elimination of some types of fraud
Potential Benefits of E-Voting

Service for voters – More (valid) votes

- Confirmation of vote/invalid warnings
  - Improved accessibility
- Increased convenience for voters
- Better service for (all?) citizens

Why is it so controversial?

- Breaks away with the most central rituals of an electoral process
- Reduces enormously human control and transparency throughout the process
- Places the system knowledge in the hands of few
The challenge

- E-voting is the most complex of the electoral technology upgrades – touches the core of the electoral process
- An opportunity to solve some old electoral problems, but also opens new ones.
- Many of the new problems are not of technical nature
Recommendations

1. Define goals clearly. Is e-voting the solution you’re looking for?

2. Be aware of the challenges. No e-voting system is perfect, and there is no standard out there.
3. Get the buy-in of key stakeholders

4. Provide for auditing and certification
5. Allow enough time for technical implementation and social acceptance

6. Plan for training, professional development and civic education
7. Calculate the real costs of ownership and not just the one-off purchase ones.

8. E-voting will not make up for the lack of trust.
Thank You!
E- Voting: An Enabler or Disabler to Strengthening Electoral Democracy?

APPENDIX 13

User-friendly e-voting an option for South Africa

Mercury Reporter

SOUTH Africa could soon join countries like India, Brazil and the Philippines in replacing traditional paper ballot-based voting with electronic voting (e-voting).

The director of e-Skills CoLab at the Durban University of Technology, Collin Thakur, recently completed an 18-month study on e-voting to determine the impact it could have here.

He announced his findings at a two-day seminar on the subject, which the Independent Electoral Commission (IEC) held in Cape Town last week.

“The findings of the study were that e-voting is a useful technology to enable democracy,” said Thakur.

Controlled e-voting took place in a booth, as opposed to uncontrolled e-voting which took place using the Internet, smart phones and fax machines. It incorporated a touchscreen interface, a keyboard, “jelly buttons” and paper ballots that were optically scanned.

Large fonts, bright colours and audio output made this technology user-friendly and elections were considered “free and fair” in the 12 countries that had already used it. It also proved an eco-friendly alternative to traditional voting.

“India used 12,000 metric tons of paper for its 1998 elections, which is a whole forest,” said Thakur.

But many countries – such as the Netherlands, Ireland and Australia – introduced them and then stopped e-voting. The reasons cited included security concerns, voter dissent and the high costs involved. E-voting would also remove the auditability of an election by taking away the paper ballot and making a recount impossible.

“This would have a huge impact on transparency,” said Thakur.

The e-voting machines were also susceptible to “hacks” and initial start-up costs would be high. “We would need over R1 billion to initiate e-voting,” he said.

Thakur said e-voting would make elections quicker and ensure a “direct democracy” in which the government could defer to the electorate on issues such as coal and nuclear plants, dams and rivers and toll roads.

The IEC has not yet made a decision on whether to adopt e-voting.

Vraag oor elektroniese stemmery

Jan-Jan Joubert

KAAPSTAD. – Adv. Pansy Tlakula, voorsitter van die Ouafrikaanse Verkiezingskommissie (OVK), het gister gewaar dat die oneindigdurend instelling van elektroniese stemapparaat in Suid-Afrikaanse verkiezings te bespreek.

’n Eerder wagtyd vir uitsaai en ekologiese reegereike deur die gebruik van minder papier is groot voordeel, het Sarelenda Thakur van die Durbanse Universiteit van Tegnologie, wat die kwessie namens die OVK onderwerp het, uitgesaai.

Tlakula, wat Kenia se pas afgegelope verkiezing meegemaak het, het ‘n skerp waarskynlik gereg: “Kenia het ons gswy wat mislukte tehnologie aan verkiezings kan doen.” Allesaam 70% van die masjien het op stemdag die gesig goeie gese.

’n Neigung bestaan om elektroniese stimmery op-die-proef te stel, maar mense moet wakker slaap.

“Tegnologie kan ‘n ander sins perfekte verkiezing strik,” het sy met verwysing na Kenia gesê.

Norske wat aan die be- rada voorgehou is, is onge veer ‘n derde van die wêreld deur demokrasie gebruik ‘n vorm van elektroniese stimmery, met kiesers in Noorweë wat seker die op die kont oor laas wees.

Indië en Britsland, die twee wêreldleiers op die gebied, toon geletterdheid met nodig- saaklik vir suksesvolle elektroniese stimmery nie.

Verskeie lande, waaronder Nederland, Duitsland, Ierland en Australië, het om verskil lende redes onlangs elektroniese stemmery laat waai. Hoe woel ander lande (waaronder baie Amerikaanse distrikte) daarmee volhou.

Nadele sluit voluit hoë koste, baie bederf (ongeldige) stemme en kieserswandetoe (dat masjien gedokter kan word).
SA may soon opt for eco-friendly e-voting

SOUTH Africa could soon join the likes of India, Brazil and the Philippines in replacing traditional paper ballot-based voting with electronic voting (e-voting).

The director of e-Skills CoLab at the Durban University of Technology, Colin Thakur, recently completed an 18-month study on e-voting to determine the impact it could have in South Africa. He announced his findings at a two-day seminar on the subject, which the Independent Electoral Commission (IEC) held in Cape Town last week.

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“India used 12 000 metric tons (12 million kilograms) of paper for its 1998 elections, which is a whole forest,” said Thakur.

But many countries – such as the Netherlands, Ireland and Australia – introduced and then stopped e-voting. The reasons cited included security concerns, voter dissent and the high costs involved. There were other disadvantages involved.

E-voting would remove the auditability of an election by taking away the paper ballot and making it a recusant impossible.

“This would have a huge impact on transparency,” said Thakur.

E-voting machines were also susceptible to “hacks” and the initial start-up costs would be high.

“We would need over R1 billion to initiate e-voting,” he said.

Nonetheless, Thakur believed in e-voting.

He said it would make make elections quicker and ensure a “direct democracy” in which government could defer to the electorate on issues such as coal and nuclear plants, dams and rivers and toll roads. The IEC has not yet made a decision on whether or not to adopt e-voting.

The commission’s vice-chairman, Terry Tselane, was quoted last week, saying: “We are confident that our democracy has reached a level of maturity whereby we can have a healthy, robust discussion of the complex issues that require consideration before embarking on the journey of implementing e-voting, should we decide to do so.”

But Thakur was hopeful the commission would recommend the legislative changes needed to begin the process of testing and piloting e-voting in South Africa. – Staff Reporter

Electoral Commission wraps up seminar

THE two-day seminar on electronic voting (e-voting) and counting technologies, the first of its kind to be convened in under the auspices of the Electoral Commission, closed yesterday. “Our intention with this two-day seminar is to stimulate debate, not to voice our position with regards to electronic voting and counting,” said Terry Tselane, vice-chairperson of the Electoral Commission. – Sapa
E-voting: An Enabler or Disabler to Strengthening Electoral Democracy?

NEW SYSTEM

E-voting may take place of paper polls

Staff Reporter

SOUTH Africa may soon be joining countries like the US, Japan, India and Russia by doing away with ballot papers and introducing a system of electronic voting.

This follows a two-day seminar on electronic voting (e-voting) and counting technologies in Cape Town.

The purpose of the seminar, held by the Independent Electoral Commission (IEC), was to explore whether South Africa was ready for a new voting system.

“Our intention with this two-day seminar is to stimulate debate. We are confident that our democracy has reached a level of maturity whereby we can have a healthy, robust discussion of the complex issues that require consideration before embarking on the journey of implementing e-voting, should we decide to do so,” said IEC vice-chair Terry Tselane.

Arthur Goldstuck, World Wide Worx managing director, believed the country was capable of an advanced system if the political and commercial will was there as it had been successful with pre-paid phones and the Gautrain.

Party in SA verdeeld oor e-stemmery

Jan-Jan Joubert

Ksaapadad. Die Onafhanklike Verkieingskommissie (OVK) sê verkoop oor elektroniese stemmer met gister ten einde gelaag met waarskynings dat stadig oor die klippe beweeg moet wees.

Kennis van oor die wêreld, van wie sommige e-stemmer met en ander dit teenstaan, het bydraes gelever. Uiteindelik was die Suid-Afrikaners verdeeld daaroor.

Party met sterk steun onder versetelklike en hoog geletterde kiesers (soos die DA, OD en VF+) was heel positief.

Party met sterk steun onder landelike en minder geletterde kiesers (soos die ANC, IVP, UDM en UCDP) het gemaak teen die verandering van die huidige stelsel.


Tlakula, wat pas terug is van die rampsoepel die vorige maand met elektroniese stemmer van de kabinet, het gesê dat hul stemmer met Suid-Afrikaners sal by.

Hierin is sy sterk gestem deur versel Patrick Chauke (ANC) en Albert Mncwango (IVP), wat die duur verwurwe van die OVK en die verkiewingproses beklemtoon het.

Chauke en Mncwango het uitgewys dat verkiegings in Suid-Afrika vrede bevorder, anders as die geweld wat tydens verkieings so veel verwerkbaar lande uitskakel.

“Daar is niks fout met ons stelsel nie. Moe- nie dan saam korrigeer nie,” het Mncwango gesê.

Daarteenoor het Mervyn Cirotta (OD) en kol. Piet Uys (VF-) gevra dat toetskopies met elektroniese stemmer aangegap word.