

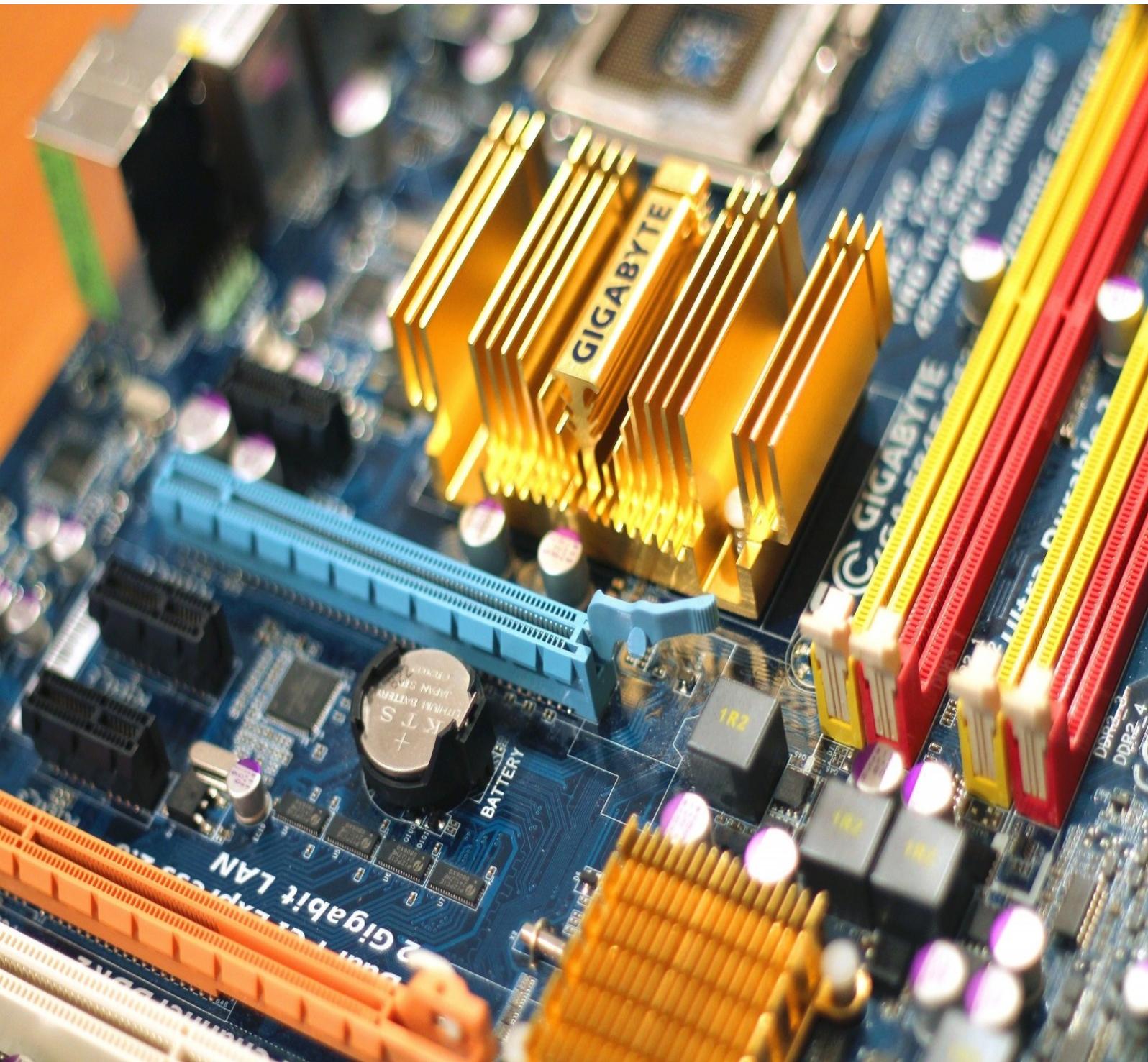


Comissão  
Nacional de Eleições



# The Use of New Technologies in Electoral Processes

Workshop report: Praia, Cabo Verde, 22–23 November 2017





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International IDEA  
Strömsborg  
SE-103 34 Stockholm SWEDEN  
Email: [info@idea.int](mailto:info@idea.int)  
Website: <http://www.idea.int>

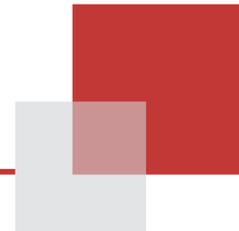
Réseau des compétences électorales francophones  
Édifice René-Lévesque, 3460, rue de La Pérade  
Québec (Québec) G1X 3Y5 CANADA  
Email: [recef@dgeq.qc.ca](mailto:recef@dgeq.qc.ca)  
Website: <https://recef.org>

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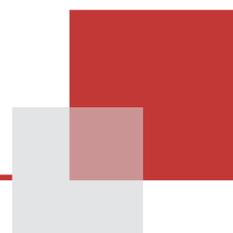
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## Abbreviations

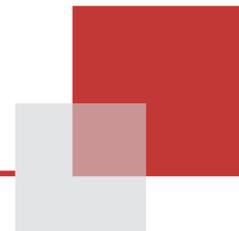
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CNE	National Electoral Commission (Cabo Verde)
COMELEC	Commission on Elections (Philippines)
ECES	European Centre for Electoral Support
EMB	Electoral management body
ICT	Information and communications technologies
IFES	International Foundation for Electoral Systems
OSIWA	West Africa Civil Society Institute

## Executive Summary

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This report documents a workshop on the use of technologies in electoral processes organized jointly by International IDEA and Réseau des compétences électorales francophones (Francophone Electoral Network, RECEF) in partnership with the National Electoral Commission of Cabo Verde and with the support of the International Organization of La Francophonie.

The event took place on 22–23 November in Praia, Cabo Verde, and was attended by 60 participants from over 30 countries. The aims of the workshop were to:

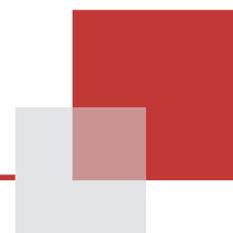
- examine the trends in new technology over the past decade and assess their impact on electoral processes;
- provide a platform for EMBs to share lessons learned on the introduction of ICTs in elections;
- identify strategies for supporting EMBs in ensuring the sustainable introduction of new technology for elections;
- examine emerging trends and potential risks related to new technology in elections; and
- reflect on possible advances in electoral technology over the next decade.

After the opening ceremony, participants heard from 18 different speakers in five panels. The panels discussed case studies presented by representatives of participating electoral management bodies (EMBs) and heard presentations from electoral experts.

At the conclusion of the event, a summary of key points was approved by the participants. This summary has been adapted for publication below as Chapter 5 of this report. The five panels, representing the key elements of the event, are reviewed in Chapter 4.

## 1. Background

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Over the past decade, new technologies have been playing an integral role in the organization of an increasing number of elections around the world. A number of countries have turned to a variety of technological solutions in a bid to make elections more efficient and more cost-effective, and to strengthen stakeholder trust in each stage of the electoral cycle. Solutions range from the use of geographic information systems to conduct boundary delimitation and establish the location of polling stations to the use of sophisticated databases to maintain the voter registers, mobile technology for the transmission of election results or electronic voting machines to enable citizens to cast their ballots. In particular, biometric technology now plays a significant role in a number of electoral processes around the world, such as voter registration and the identification of prospective voters at the polling station on election day.

The introduction of information and communications technologies (ICTs) into the electoral process is generating both interest and concern among voters and practitioners across the globe. Technology has undoubtedly helped electoral management bodies (EMBs) to make their processes more efficient. Increased Internet penetration—even in developing countries with poor communications infrastructure—is enabling EMBs to be more effective at communicating internally and with all the stakeholders involved in the process.

Technology is also playing an increased role in enhancing the integrity of electoral processes and strengthening trust between stakeholders. The use of biometric technology in voter registration has enabled EMBs to improve the accuracy of voter registers by providing an effective mechanism for identifying duplicate entries on the voter register. The use of biometric technology to verify voters' identities on election day has also contributed to enhanced trust in the electoral process. Similarly, technology is providing EMBs with ways to count, tabulate and transmit the results of elections more quickly through measures such as electronic voting or transferring election data through mobile technology. This enables election results to be announced sooner, which can diffuse tension in closely contested elections and strengthen trust in the process. Research suggests that, despite its cost, biometric technology can be a worthwhile economic investment for a country even if it only decreases the likelihood of serious post-election violence by a few percentage points.

Paradoxically, some of the earliest and keenest adopters of new electoral technologies have been from among the poorest countries, often those without a long history of conducting democratic elections. In these contexts, adopting new and sometimes costly technology is specifically designed to address the trust deficit between electoral stakeholders. In many cases, however, the technology does not necessarily improve trust in the process or address the problem it sought to resolve. In other contexts, technology has been introduced with inadequate research, planning, testing, training or voter education, resulting in decreased

trust in the process and increased costs to the electoral budget. Many EMBs now face the challenge of maintaining and replacing software and hardware, which has raised concerns about the sustainability of some electoral technology.

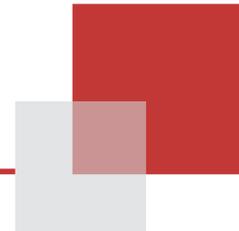
The rapid adoption of new technology by EMBs that has taken place over the past decade means that now is an opportune time to take stock and reflect on how technology has affected electoral administration around the world. The lessons of the past decade show that technology has significant potential to strengthen electoral integrity, but its introduction and use must be grounded in well-designed policies, surrounded by adequate safeguards and supported by legislation that is capable of dealing with the issues that arise. If not, technological applications may lead to an erosion of public confidence in electoral processes.

There is a need to examine how recent technological advances can help to further enhance electoral integrity and participation, and how they can be integrated into the electoral process in a sustainable way. Similarly, cybersecurity is emerging as an important topic in the discussion on how to prevent electoral interference or fraud. There is a need for EMBs to share their strategies and best practices for dealing with these emerging trends.

It is in this context that RECEF and International IDEA convened a workshop on the use of technologies in electoral processes on 22–23 November 2017. This report summarizes the content of the discussions that were held in each of the five workshop panels.

## 2. Objectives

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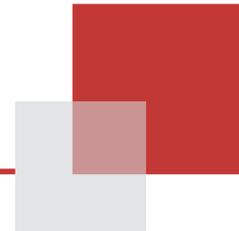


The overall objective of the workshop was to enhance the capacity of participants to ensure that ICTs contribute to strengthening the transparency and credibility of electoral processes. The specific objectives were to:

- examine the trends in new technology over the past decade and assess their impact on electoral processes;
- provide a platform for EMBs to share lessons learned on the introduction of ICTs to electoral processes;
- identify strategies to support EMBs to ensure the sustainable introduction of new technologies in elections;
- examine emerging trends and potential risks related to new technology in elections; and
- reflect on possible advances in electoral technology over the next decade.

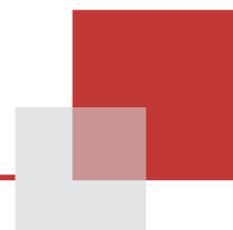
### 3. Participants

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The workshop was attended by 60 participants from around 30 countries in Africa, the Middle East, Europe, the Americas and Asia, representing electoral management bodies as well as international and regional elections-focused organizations. Among the participants were experts from the International Foundation for Electoral Systems (IFES) and the European Centre for Electoral Support (ECES). Annex C lists all the participants. The event was conducted in English, French and Portuguese, and simultaneous interpretation service was provided to facilitate the discussions.

## 4. Report from the workshop



The workshop was formally opened by Maria Do Rosário Lopes Pereira Gonçalves, Chairperson of the National Electoral Commission of Cabo Verde; Cyrille Zogo Ondo, representative of the International Organisation of La Francophonie; Professor Adebayo Olukoshi, International IDEA's Regional Director for Africa and West Asia; General Siaka Sangaré, Chairman of RECEF, and Jorge Santos, the Speaker of the National Assembly of Cabo Verde.

The event was structured in five panels, each of which had three or four speakers and was moderated by one of the participants. The following sections capture the content of the discussion in each panel. The speakers' presentations to the workshop can be accessed on the RECEF website at <http://www.recef.org> and on the International IDEA website at <https://www.idea.int/news-media/multimedia-reports/new-technologies-play-integral-role-organizing-elections>.

### Panel 1. Overview of the use of technology in electoral processes in the past decade

Moderator	Badrieh M. A. Al-Balbisi, Secretary General of the Network of Arab EMBs
Speakers	<ul style="list-style-type: none"><li>• Peter Wolf, Technical Manager, International IDEA</li><li>• Mathias Houunkpe, Programme Administrator for Democratic Governance, West Africa Civil Society Institute (OSIWA)</li><li>• Abbas Sabah Qasim Al-Jawabir, ICT Director, Independent High Electoral Commission of Iraq</li><li>• Mike Yard, Electoral Expert, IFES</li></ul>

The first workshop panel sought to provide an overview of the technologies used throughout the electoral cycle, primarily in Africa but also in Europe and North America. The discussions provided participants with an overview of trends, challenges and lessons learned. A recap of the key historical milestones in the use of technology in elections around the world illustrated the progress made over the past two decades. These include the pioneering use of electronic voting machines in India and Brazil in the late 1980s and early 1990s, the early 2000s 'boom' in the use of voting machines, especially for elections conducted in the USA, and Estonia's introduction of Internet voting in 2005.

In 2005–2006, the Democratic Republic of the Congo became the first country to use biometric technology for voter registration and many African countries followed suit to register voters or identify them at polling stations. Other technologies were also introduced

to facilitate the transmission of results. In 2007, hackers and a coalition of media outlets and civil society organizations managed to expose weaknesses in electronic voting machines in the Netherlands. The country eventually reverted to a paper-based ballot system in 2008. Ireland also cancelled the use of machines already procured. In 2009, the Constitutional Court of Germany found the use of electronic voting machines unconstitutional, since the results would not be verifiable by the public.

The speakers demonstrated that the introduction of ICTs has had some advantages, among them the possibility of enhancing voter confidence and increasing the integrity, accuracy and transparency of the electoral process. However, they also emphasized that significant debate should take place before any decision is taken to introduce any new technology. EMBs should outline the objectives and problems being addressed by the introduction of ICTs, and also take into account the short lifespan of technologies and match them with the duration of the electoral cycle.

EMBs should strive to ensure that a sufficient number of qualified staff are in place to maintain systems once the technology has been put in place. The speakers emphasized the importance of investing in the training of staff to guarantee system maintenance, facilitate the addition of new features and modifications to the system, and guarantee the ability to resolve any system malfunctions.

In West Africa, some of the challenges to electoral processes are a lack of stakeholder confidence, the weak integrity of electoral processes, the quality of citizen participation and the rising cost of elections. New ICTs can offer solutions to these challenges in some instances. ICTs can bring about greater efficiency in data capture and analysis, and reduce the risk of mistakes. In addition, the introduction of new technologies might facilitate interaction and the sharing of information in real time between actors, thereby contributing to increased transparency in the management of electoral process.

The Iraq case study supports this observation. In 2014, a country with 22 million voters established a biometric voter register in response to the challenges of updating the voter register and searching for a given voter on the register on polling day. The new biometric voter register ensures greater efficiency and increased security in one. The voter register was therefore a good starting point for the introduction of new technology in elections.

EMBs can look to other fields or sectors for inspiration in developing new technologies for electoral processes. For instance, in the field of retail technology, a series of tests is made to verify that a system is working properly. In the aerospace sector, extensive preparations and testing are carried out in advance to ensure the success of a project. Furthermore, it is wise to avoid the most complex technologies, since the simplest methods are sometimes the most efficient. In Germany, there is a constitutional requirement that every citizen should be able to understand the technology and how it functions. This constitutional provision prevents the implementation of technologies that are too complex in elections.

There is vast potential to explore in ICTs. While such technologies have the potential to resolve issues related to electoral management, they must be used carefully and not neglect the necessary synergy with traditional methods. Finally, the legal framework and electoral procedures must be considered carefully when embedding new technologies into the electoral process. At the same time, there must be realistic expectations about the new systems.



## Panel 2. Medium- and long-term trends in the use of technology in elections: Review of efficiency, sustainability, maintenance and overall impact on the electoral process over time

Moderator	Hery Rakotomanana, Chairperson of the Independent National Electoral Commission of Madagascar
Speakers	<ul style="list-style-type: none"> <li>• Al A. Parreno, Member of the Commission for Elections of the Philippines</li> <li>• Général Siaka Sangaré, Executive Officer for Elections in Mali and President of RECEP</li> <li>• Maria Do Rosário Lopes Pereira Gonçalves, Chairperson of the National Electoral Commission of Cabo Verde</li> <li>• Elmano Amancio De Sa Alves, Advisor to the Department of Information and Communications Technologies, Superior Electoral Court of Brazil</li> </ul>

The introduction of ICTs has greatly influenced the development of electoral processes. In some instances, the planning of electoral cycles has been made more complex, the cost of organizing elections has increased and the granting of significant contracts to international firms is now part of the new reality. The second panel shared experiences of the use of technologies in elections over several electoral cycles, and reviewed their experience in terms of efficiency, sustainability, maintenance and the impact on the electoral process. This panel sought to identify some fundamental principles to be observed to ensure the integrity of the electoral process and promote confidence among actors, with the aim of promoting the efficient and sustainable introduction of ICTs.

The Philippines has used technology in elections for the past 20 years and the first fully automated national elections took place in 2010. A country of over 7,000 islands and 54 million voters poses major challenges for the Commission for Elections (COMELEC). The case study emphasized the significance of establishing a rigorous legal framework when working to introduce new technologies into the electoral process.

COMELEC has had to deal with a number of legal challenges in recent years. This led the country to establish an Independent Technology Assessment Committee in order to get buy-in from and gain the confidence of all stakeholders. The law also contains provisions to ensure flexible timeframes and modalities for the technologies to be put in place. Provisions related to the education and participation of stakeholders are a fundamental component of the legal framework. These provisions aim to ensure that the technology is understood by voters and political parties. Other provisions allow for a revision of the source codes by stakeholders or a third party.

The introduction of technology must be adapted to the level of development in the country in question and cannot resolve a deficit in confidence in the electoral system among or between stakeholders. For instance, even though it is often perceived as a silver bullet, biometric technology is costly and cannot resolve all the problems related to voter registration.

In Mali, the challenges related to establishing a voter register were resolved through the implementation of a reliable civil registration system. In 2003, the Government of Mali initiated a modernization of the civil registration database through the implementation of a unique identification: the Numéro d'Identification Nationale (NINA) card. This became a voter ID card in 2013, following the development of a biometric file that contained a photograph and the digitalized fingerprints of all voters. Despite certain weaknesses in relation to security, deterioration and even data capture errors, the NINA card helped to enhance the credibility of elections. Biometric data contributed to an improvement in several elements of the electoral process, most notably the eradication of duplicates from the register and compliance with the maximum number of voters per polling station (500).

Improvements are planned for the next electoral cycle, which illustrates the need to assess the systems introduced in order to make necessary adjustments.

Cabo Verde introduced legislative provisions on the use of technology, especially with regard to voter registration, the conduct of elections and the transmission of election results, while also conducting civic education programmes for its citizens. In 2008, following criticism of the quality of the computerized voter register, the National Electoral Commission began work on the biometric registration of voters and the creation of a national database. This considerably reduced mistakes in the identification of voters and helped to lend credibility to the voter register. However, the high cost of maintaining the machines and updating the software remains a challenge. Since 1999, legislation has provided for the use of electronic voting and the biometric identification of voters at polling stations, but these modalities have not yet been introduced. The basic requirements for the successful introduction of these technologies, such as consensus-building among stakeholders, have not yet been met.

Brazil has used various technologies at different stages of the electoral process for nearly 20 years. An election in Brazil involves slightly more than 144 million eligible voters, nearly 500,000 candidates and 2.4 million electoral officials. The slow manual process and the high number of mistakes linked to human intervention are among the reasons why the country turned to technology. This automation, which has included the introduction of electronic voting machines and biometrics to identify voters, was achieved progressively. In order to plan for the introduction of technology, the Electoral Commission conducted a cost-benefit analysis and chose a solution developed in Brazil. The use of a tailor-made, internally developed solution allowed the EMB to safeguard against electoral fraud. The software and technologies developed were adapted to the specific legislative and contextual needs of the country. Despite all these advantages, challenges remain regarding the confidence of the public in the technologies used during elections, especially in terms of the security of the process.

### **Panel 3. Decision-making on the adoption of new technologies in the electoral process: Feasibility study, needs and security assessments, and evaluation of other factors in making an informed decision**

Moderator	Catherine Lagacé, Secretary General of the Chief Electoral Officer of Quebec
Speakers	<ul style="list-style-type: none"> <li>• Karine Morin, Chief of Staff, Elections Canada</li> <li>• Ulrich Freyer, Commissioner at the Electoral Commission of Namibia</li> <li>• Amadou Salif Kébé, Chairperson, Independent National Electoral Commission, Guinea</li> <li>• Christian-Alexandru Leahu, Head of Legal Department, Permanent Electoral Authority of Romania</li> </ul>

This panel sought to share information about the decision-making process on the introduction of new technologies into the electoral process. In some countries, technologies were introduced without conducting a feasibility study, which sometimes led to reduced confidence in the electoral process.

The Polling Place Process Enhancement Project in Canada is a case that illustrates the importance of each step in the decision-making process. The first step was to analyse and assess the efficiency of the existing voting system. This analysis showed perceived inefficiencies in the polling stations, with voters unhappy about long waiting times to cast their ballots and poll workers complaining about difficult working conditions.

The next step was to identify needs and the objectives to be achieved through any new solution, before assessing the efficiency of the options under consideration. This analysis aimed to ensure that the planned technological option would be the best solution for



reducing waiting times and improving the working conditions of polling staff. Consulting stakeholders is also an important step in the decision-making process in order to obtain buy-in. In Canada, parliament was consulted to seek its approval and allow it to make adaptations where necessary.

In 2014, Namibia was the first African country to conduct elections using electronic voting. The introduction of electronic voting was preceded both by a feasibility study and a field visit to India to assess their experience of electronic voting. Furthermore, different consultations conducted over a 10-year period facilitated buy-in from and enhanced the confidence of stakeholders. Indeed, without stakeholders' confidence in the technology, automation of the voting process would have posed additional challenges for the EMB. In addition, investing time in testing prototypes can prove useful when the time comes to make proposals for legislation. These tests allow for adjustments to be made before final legislation is submitted. Throughout this process, the proper training of electoral officials, extensive programmes of voter education and contingency planning were key requirements for the successful implementation of electronic voting. In Namibia, the use of a voter verified paper audit trail is currently under consideration to enable a full audit of election results.

The case of Canada illustrates that a public procurement process should be put in place once the initial research and feasibility studies have been conducted. Goods and services provided by vendors can significantly help EMBs improve the organization of elections. In recent times, however, there has been a proliferation of suppliers offering solutions for electoral processes. EMBs should be precise in identifying the issues they are tackling and the improvements they are seeking to make so that solutions can be adapted in an appropriate way.

A number of political, legal, technical and financial factors need to be considered when selecting a supplier. This allows the EMB to protect its integrity, neutrality and independence. Guinea's experience sheds light on this issue. In periods of political crisis, as have occurred in Guinea, dialogue between different stakeholders is one of the major factors that influence the choice of vendor and the timeframe for implementation of a technological solution. In Guinea, the use of a public tender process enabled stakeholders to monitor the selection process, which included some fundamental technical and financial specifications that suppliers had to abide by. Among these were issues related to cost-effectiveness, the security and accuracy of the results, and protection of personal data. In addition, the selection process had to abide by a legal and institutional framework, and be carried out in a transparent manner. In addition, political and legal issues related to cybersecurity in the electoral process must not be neglected in the decision-making process. Depending on the context, concerns about cybersecurity can either hinder electoral computerization or catalyse electoral reform.

Disinformation and concerns about cybersecurity can undermine the implementation of technology in electoral processes. Perceived threats sometimes hide the reality. In this context, the EMB should strive to inform stakeholders and obtain their buy-in. In Romania, for example, all the alternatives regarding the implementation of electronic voting were rejected because informing citizens about the security aspects of the system proved too challenging and they failed to gain the confidence of voters. In these contexts, efforts to invest in a proactive risk management strategy and the protection of infrastructure and personal data must not be neglected if the introduction of technology into the electoral process is to be successful. These elements should be embedded in the decision-making process.

## Panel 4. Technology procurement processes and national capacity building in managing and maintaining technological solutions

Moderator	Thiago Fini Kanashiro, Senior Advisor on Electoral Management, Superior Electoral Court, Brazil
Speakers	<ul style="list-style-type: none"> <li>• Mohamed Ould N'Tilitt, Director of IT and the Electoral Register, Mauritania Independent National Electoral Commission</li> <li>• Sébastien Allard, Director of Information Resources of the Chief Electoral Officer of Quebec</li> <li>• Mahmood Zain, Director of ICT at the National Electoral Commission of Jordan</li> </ul>

After the decision to introduce technology into the electoral process has been made, the EMB should assess which option is the most efficient and cost-effective. Automation of certain steps in the electoral cycle might not be the best option in all instances. The successful introduction of a new technology requires sound planning by the EMB. This panel aimed to increase understanding of the principles and rules of the procurement process, of the need to ensure the development of internal expertise and the maintenance of technology between electoral cycles, and to set out good practices in this regard.

Getting agreement to implement technologies in the electoral cycle requires a progressive and consensual dialogue. This was the case in Mauritania, where prior exchanges aimed to identify specific technology needs and the elements of the electoral cycle that could be automated, and, in some cases, to embed these elements into the Electoral Commission's strategic plan. A public tender process then allowed comparison of different proposals and ensured that the bidders were catering for genuine needs. The tender processes ensured transparency and equity, as well as a competitive process.

In the procurement process, a decision to rely on internal expertise can often be a good solution for electoral commissions. In Mauritania, the internal expertise of 80 IT engineers was leveraged at a cost 15 times lower than the amount proposed in a bid from external suppliers. Quebec chose to develop internal expertise and to request support from external suppliers only when more specialized skills were needed. No 'turnkey' type contract has been awarded since 2010. In this way, firms never act on their own and responsibility for the project remains in the hands of the EMB—thereby ensuring its independence and integrity.

The Mauritania case demonstrates that despite the benefits of developing technology internally, it is still necessary to address needs in the process in order to gain the buy-in and confidence of stakeholders. Political parties in particular must be convinced of the reliability of the technological solution and its compliance with international standards in this field. In order to introduce technology transparently and successfully, efforts must be made to provide appropriate information to relevant actors. In Mauritania, the legal framework and information about the mission of the Commission were published on the bilingual website of the organization. In addition, in order to develop the skills of the electoral staff, the Commission engaged in a capacity-building programme campaign regarding the procedures in this area.

In order to ensure transparency, the Electoral Commission of Jordan installed cameras to enable the various actors to monitor the opening of ballot boxes. Jordan also used a geographic information system to position voting centres and allocate polling stations to each voter.

The planning phase of the introduction of technology is instrumental. The time invested in planning saves money and increases efficiency. This step allows EMBs to anticipate challenges and plan for the development of internal expertise and knowledge transfer.

During negotiations, to ensure a successful contract with a vendor, it often proves useful to integrate certain provisions such as training on the technology to be implemented, the



support and troubleshooting to be provided by the supplier and access to documentation on the functioning of the selected solution. The contract should include a plan for project milestones, elements related to the maintenance of the solution following its implementation and safeguards on system operation.

Finally, introducing a technology can be both beneficial and challenging in many ways. These challenges are the responsibility of the Commission but can sometimes be beyond its control. For instance, Jordan was faced with the deliberate sabotage of its generators and cables but, through sound planning and the existence of a contingency plan, some of the effects were mitigated. In the Jordanian context, all polling stations and centres were connected to a database at the main office of the Electoral Commission. Backup infrastructure was also located in a secondary location, however, in case of technical problems with the main infrastructure. Whether developed internally or by external suppliers, the introduction of technology is an initiative that requires efficient planning and the development of contingency plans.

### Panel 5. Elections and technology in the next decade: emerging trends and innovations

Moderator	Maria Do Rosário Lopes Pereira Gonçalves, Chairperson of the National Electoral Commission of Cabo Verde
Speakers	<ul style="list-style-type: none"> <li>• Fabio Bargiacchi, Executive Director, European Centre for Electoral Support (ECES)</li> <li>• Issa Sall, Commissioner at the Autonomous National Electoral Commission of Senegal</li> <li>• Melanie du Plessis, Director of ICT at the Electoral Commission of South Africa</li> </ul>

This panel assessed the future of certain technologies and examined emerging trends and innovations. Although the principles of elections remain constant, there has been an increased use of ICTs in election management over time as well as changes in the way elections are conducted. All states are affected and have to adapt to this new reality.

In many cases, the development of internal expertise seems to be an efficient solution and a requirement for success. Developing internal business solutions facilitates monitoring of the system, allows EMBs to safeguard their independence for system maintenance and simplifies the process of updating technology. Internal expertise also allows for greater autonomy and flexibility.

In the context of the introduction of technology in Senegal, developing internal expertise proved efficient. The EMB's choice of a technical partner to develop new technology allowed them, over time, to build internal expertise and gain local ownership of the process. Technologies offer positive potential to improve electoral processes, but introducing new technologies requires time and caution. New technology seems to be necessary for the successful implementation of different projects and the achievement of goals. The automation of issuing national identity cards in Senegal in the late 1970s did not avoid political protests about voter registration. However, in the early 1990s various reforms resulted in the development of a consensual Electoral Code and electoral results have not been challenged since 1993.

Nonetheless, the solution does not always lie with computerization. In Senegal, the electoral process at the polling station remains paper-based. Voting and counting are done manually and there are no plans to introduce new technologies to this phase of the electoral cycle. Stakeholder concerns over trust and transparency have been key to retaining a paper-based system. Consequently, polling station activities take place in the presence of stakeholders in a fully transparent manner. In South Africa, the establishment a Political

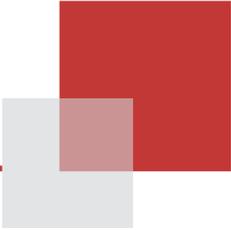
Parties Liaison Committee, which is involved in all phases of the electoral cycle, ensures that the entire electoral process is open and transparent.

Other good practices have contributed to the successful introduction of technology. For instance, EMBs conduct feasibility studies, participate in study trips to learn about existing practices, share among peers and implement pilot projects. These initiatives support project design and planning. Moreover, EMBs should ensure that the introduction of technology is not driven by suppliers' or donors' interests. Implementation must be gradual and abide by national legal frameworks.

Finally, a huge number of new technologies are available to EMBs. The use of geographic information systems has considerable potential. In South Africa, such a system was used to outline electoral boundaries and the locations of polling stations, which were approved by the Political Parties Liaison Committee. In this case, the geographic information system also enabled the collection of voter data, with regard to age, gender and political grouping. It also enabled the establishment of an atlas of results by voting section or other geographic divisions.

Finally, the use of technology is not evidence of a country's 'level of development'. Nor should it be an end in itself or make the process more complicated. It should be easy to understand by the relevant actors and by the general public. Furthermore, one of the key challenges remains ensuring the sustainable and cost-efficient use of a technology. This must take into account the differences between democracies, their economic contexts and their level of development. There is no universal solution and technology should address the specific needs of each situation.

## 5. Summary of key points



This chapter captures the key findings presented during the closing session under four priority areas:

1. Overall findings and the benefits of using technologies in electoral processes
2. Challenges and limitations of their use
3. Requirements for the successful introduction of ICTs
4. Conclusions and future prospects

### 5.1. Global findings on the benefits of using technologies

The use of technologies in electoral processes varies from one country to another. As part of this workshop, all the presentations revealed that technologies offer undeniable advantages and that their potential is far from being exhausted. They deserve the full attention of electoral practitioners and experts.

Embedding technologies into electoral processes has the potential to increase voter confidence and contribute to increased integrity, accuracy and transparency in the electoral process. In some cases, the use of technologies offers quicker implementation and a reduced risk of mistakes in different aspects of the electoral cycle. It also facilitates interactions and information sharing in real time between stakeholders.

### 5.2. Challenges and limitations

Despite these advantages, it is advisable to take care in adopting technologies, since they also present certain challenges and have certain limitations. An EMB should undertake a cost-benefit analysis before selecting technologies. It should also be aware that there are no universal solutions. The level of development in each country, its social and political context, and its geography and size are among the factors that should be considered. For instance, the Philippines, a country of over 7,000 islands, had to take its geographic specificities into account when introducing technology.

Finally, technology is not necessarily the best solution or an end in itself. It can neither prevent nor resolve political or social crises. Nonetheless, they can mitigate the risks that might lead to a crisis. Among the issues to be monitored are the reliability of the machines,

the secrecy and security of the vote, and the lifespan of the technology and how this matches the timeframe of the electoral cycle.

### **5.3. Requirements for facilitating the successful, efficient and sustainable introduction of technologies**

The national experiences presented in this workshop, and those of Brazil and Iraq in particular, demonstrate that careful planning is crucial before initiating the introduction of new technology. This allows challenges to be foreseen and internal expertise to be built. The Quebec experience demonstrates that planning is instrumental to saving money and avoiding extra costs in the long run.

The successful introduction of technologies goes hand in hand with a sound legal framework. The case of the Philippines illustrates that an EMB can be vulnerable to litigation by electoral stakeholders. Despite the existence of legislation to regulate the introduction of technologies, it might sometimes be prudent to postpone a decision to go ahead where all the requirements for success have not been met. This was the case in Cabo Verde and Mali. When introducing new technologies it is crucial to establish the ideal conditions, which means gaining the buy-in and confidence of stakeholders. In Brazil, independent monitoring and evaluation mechanisms, such as an independent technical evaluation committee and a review of source codes by a third party, were put in place. These mechanisms contributed to a more transparent process. Furthermore, in order to get the buy-in of relevant actors, it is crucial to encourage them to participate, and to provide them with detailed information on the technology.

The successful introduction of technologies also depends on a cost-benefit analysis. A clear articulation of the problems faced and the desired improvements is instrumental to determining which solutions are best in each situation. The case of Canada illustrates how important it is to properly outline the issues and the goals to be achieved. In short, in order to maximize the gains, it is crucial to establish clear targets for the steps in the electoral cycle that need to be automated.

The cost-benefit analysis should also take account of the costs of testing the systems on a regular basis as well as the maintenance of and updates to systems. The costs related to the storage and renewal of equipment should also be part of the evaluation. EMBs should ensure that they have the necessary staff to ensure proper maintenance. Both Brazil and Iraq invested in developing such national expertise.

The selection of external partners or suppliers, as required, should be carefully considered. Certain principles and regulations in the procurement processes will be crucial. It might be necessary to consult stakeholders during the tender process, as was the case for example in Canada and Namibia. The procurement process should be transparent in order to justify the choices made and safeguard the independence and integrity of the EMB. Contracts might include provisions that ensure expertise or knowledge transfer. EMBs must remain the true owners, as illustrated by the case of Quebec.

Developing internal expertise might prove a good solution to reducing costs. In such cases, it is essential to establish the correct conditions for obtaining the buy-in and confidence of stakeholders. This is well illustrated by the case of Mauritania, which invested in its own internal expertise. The EMB managed to prove to the relevant actors that the proposed solution was reliable and abided by international standards in the electoral field. The EMB was able to demonstrate the reliability of its system, thereby illustrating that the development of new technology does not necessarily have to be done through private sector firms.

Given the limited lifespan of technologies, it might be appropriate to consider using a technology for more than one phase in the electoral cycle, and to explore opportunities for equipment sharing between countries in the same region. In these contexts, it will be



necessary to look at the bigger picture beyond the electoral process. For instance, Mali invested in consolidating its civil register, thereby developing an appropriate and consensus-based voter register.

It is crucial to properly test a technology before it is introduced. Namibia introduced electronic voting after 10 years of consultations, testing and examining a variety of prototypes. The Romania case study emphasizes the importance of investing in efforts to establish a proactive risk management strategy aimed at protecting infrastructure, countering cyberthreats and protecting personal data, proving that contingency planning is pivotal.

#### **5.4. Some conclusions and future prospects**

Overall, despite their various weaknesses, ICTs have significant potential to improve electoral processes. In order to avoid or minimize their shortcomings, it is important to be patient in their introduction. Feasibility studies, as well as tight specification of objectives and needs should guide the introduction of technological solutions into the electoral process. Nor should the required legislative amendments and new procedures that result be neglected. Establishing new technologies in the electoral process should involve all actors in order to guarantee the confidence of stakeholders in each step of the electoral cycle. This will help to strengthen the credibility and transparency of the process. It is also crucial to monitor a system's resilience to cyberthreats, to ensure that it is protected against hackers and any other possible intruders. This will prevent electoral fraud and strengthen the credibility of elections.

Moreover, the continued use and efficiency of technologies requires the regular maintenance of new solutions. Trained and skilled staff should be on hand to ensure proper maintenance and allow EMBs to add new features, make modifications to the system and troubleshoot any problems.

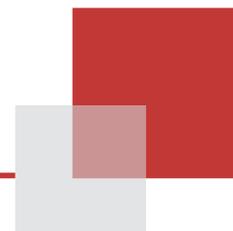
Technology should be appropriate to the level of development of a country, its geography, and its political and social realities. Finally, factors such as the short lifespan of new technologies and the timing of their introduction in the electoral cycle should also be taken into account. This is necessary to ensure a synergy between existing platforms and the new technologies introduced.

As for future prospects, several presentations addressed communication with voters and political parties. It is of strategic importance to be open to the opportunities presented by social media, smart telephones and the Internet in these areas. Open data and open source technology also offer new areas of potential that deserve further scrutiny. The case of South Africa clearly illustrates the potential of geographic information systems in the electoral context. Finally, the application of blockchain technology to elections, as storage and information transmission technology, is another area worthy of further study and debate. Electoral technology is a field in itself but the use of technologies in other sectors can be a source of inspiration for improving the conduct of elections.

In conclusion, the continual adoption of new and emerging ICTs in electoral processes is here to stay, and they will need to be monitored and studied on a continuous basis. Failure to do so would result in electoral processes falling behind other sectors and becoming outdated.

## Annex A. Concept note

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### **Workshop on the use of information and communications technologies in electoral processes: Assessing experiences over several electoral cycles**

Praia, Cabo Verde, 22–23 November 2017

#### 1. Introduction

Over the past decade, new technologies have played an increasingly integral role in the organization of elections around the world. A number of countries have turned to a variety of technological solutions in a bid to make elections more efficient, more cost-effective and to strengthen stakeholder trust at each stage of the electoral cycle. The solutions range from the use of geographic information systems to conduct boundary delimitation and the establish polling stations; the use of sophisticated databases to maintain the voter registry; the use of mobile technology for the transmission of election results; and the use of electronic voting machines for citizens to cast their ballots. In particular, biometric technology has come to play a large role in a number of electoral processes around the world during voter registration as well as during the identification of prospective voters at the polling station on election day.

The introduction of information and communications technologies (ICT) into the electoral process is generating both interest and concern among voters, as well as practitioners across the globe. Technology has undoubtedly assisted Electoral Management Bodies (EMBs) in making their processes more efficient. Increasing internet penetration—even in developing countries with poor communication infrastructure—is enabling EMBs to be more effective in communicating both internally as well as with all stakeholders involved in the process.

Increasingly, technology is also playing a role in enhancing the integrity of electoral processes and strengthening trust between stakeholders. The use of biometric technology in voter registration has enabled EMBs to improve the accuracy of voters' rolls by providing an effective mechanism to identify duplicate entries into the voter registry. The use of biometric technology to verify voters' identities on election day has also contributed to enhancing trust in the electoral process. Similarly, technology is also providing EMBs with ways to count, tabulate and transmit elections more quickly through measures such as electronic voting or transferring election data through mobile technology. This enables election results to be announced sooner, potentially diffusing tension in closely contested elections and strengthening trust in the process. According to some research, despite its cost, biometric



technology can be a worthwhile economic investment for a country even if it only decreases the likelihood of serious post-election violence by even a few percentage points.

Paradoxically, some of the earliest and keenest adopters of new electoral technologies tend to be poorer countries, often without a long history of conducting democratic elections. In these contexts, adopting new and sometimes costly technology is specifically designed to address the trust deficit between electoral stakeholders. Yet in many cases, the technology does not necessarily improve trust in the process or address the problem it aimed to resolve. In other contexts, technology has been introduced with inadequate research, planning, testing, training and voter education – resulting in either decreased trust in the process and/or increased costs to the electoral budget. Many EMBs are also faced with the challenge of maintaining and replacing software and hardware, which is raising concerns about the sustainability of some electoral technology.

With the rapid adoption of new technology by EMBs having taken place over the past decade, now is an opportune time to take stock and reflect on how technology has affected electoral administration around the world. The lessons of the past decade show that technology carries a great potential to strengthen electoral integrity, but its introduction and use must be grounded in well-designed policies, surrounded by adequate safeguards and supported by legislation that is adequate to deal with the issues that it raises. Otherwise, technological applications may lead to erosion of public confidence in electoral processes.

Though technology is a rapidly changing field, now is also an opportune time to assess emerging trends and speculate on how they may affect electoral process over the next decade. There is a need to examine how recent technological advancements could contribute to further enhancing electoral integrity and participation and how they can be integrated into the process in a sustainable manner. Similarly, cyber security is emerging as an important topic in the discussion on how to prevent electoral interference or fraud. There is a need for EMBs to share strategies and practices to deal with some of these emerging trends.

It is to reflect on these critical issues that the organizing partners have convened a workshop on New Technology in Electoral Processes in Praia, Cabo Verde, from 22–23 November 2017.

## 2. Objectives

The overall objective of the workshop will be to enhance participants' capacity to ensure that ICTs contribute to strengthening the credibility, transparency and credibility of electoral processes.

Specific objectives include:

- examining the trends related to the new technology over the past decade and assessing their impact on electoral processes;
- providing a platform for EMBs to share lessons learned on the introduction of ICTs in elections;
- identifying strategies to support EMBs in ensuring the sustainable introduction of new technology for elections;
- examining emerging trends and potential risks related to new technology in elections; and
- reflecting on possible advances in electoral technology over the next decade.

It is expected that following this activity, the organizing partners will develop a policy paper intended to provide the target audience with a series of recommendations aimed at ensuring the sustainable use of technology in electoral processes.

### 3. Participants

The workshop will bring together approximately 40 participants from Africa and the rest of the world. Among the participants will be:

- Representatives of EMBs
- IT staff from EMBs
- Electoral technology experts
- Representatives of international organizations

### 4. Methodology

The workshop will take place over a two-day period and will consist of five/six thematic panel discussions. Each two-hour panel will have a dedicated theme and will include 3-4 presentations of approximately 20-30 minutes by experts to share thematic knowledge and/or experiences from selected case studies. At the end of each panel, the plenary will be invited to participate in discussions and debates on the issue concerned.

Illustrative examples of potential panels include:

1. Overview of the past decade of technology in electoral processes;
2. Utilizing ICTs in elections in the mid and long term: taking stock of experiences regarding effectiveness, sustainability, maintainability and overall impact on the electoral process over time;
3. The decision-making process of adopting new technology in the electoral process: feasibility studies, needs assessments, security, evaluation and other factors informing a final decision;
4. Procurement process: market research (including the use of open source technology), developing specifications, tendering process and drafting contracts with the vendor;
5. Building domestic capacity to manage and maintain technological solutions: lessons learned;
6. Elections and technology in the next decade: emerging trends and innovations.

Prior to the workshop, the organizers will invite EMBs from selected countries to prepare case study presentations.

### 5. Language

The workshop will be conducted in several languages to ensure broad participation. Simultaneous interpretation will be available in English, French and Portuguese.

### 6. Venue

Praia, Cabo Verde.

### 7. Partners

At present, the proposed organizing partners include:

- Comissão Nacional de Eleições (CNE) de Cabo Verde;
- International IDEA;



- Réseau des compétences électorales francophones (RECEF); and
- Organisation internationale de la Francophonie (OIF).

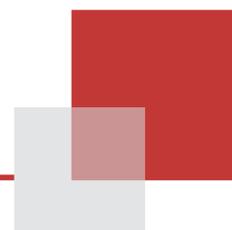
## 8. Materials

For interested participants, background material developed by International IDEA on the topic area of elections and technology is suggested:

- International IDEA: Introducing Electronic Voting: Essential Considerations
- International IDEA: The Use of Open Source Technology in Elections
- International IDEA: Certification of ICTs in Elections
- International IDEA: Electoral Law Reform in Africa: Insights into the Role of EMBs and Approaches to Engagements
- International IDEA: Open Data in Electoral Administration
- International IDEA: Introducing Biometric Technology in Elections
- EC/UNDP JTF on Electoral Assistance & International IDEA: Procurement Aspects of Introducing ICT Solutions in Electoral Processes, The Specific Case of Voter Registration
- ACE Topic Area: Results Management Systems (also available in French)
- EISA: Voter Registration in Africa: A Comparative Analysis
- Biometric Elections in Poor Countries: Wasteful or a Worthwhile Investment?, Center for Global Development Working Paper 435, August 2016

Additional material in English and French on elections and ICTs can be found on the ACE website.

## Annex B. Workshop agenda



### Day 1: Wednesday 22 November 2017

9:00	Opening ceremony	<p><b>María Do Rosário Lopes Pereira Gonçalves</b>, Chairperson, National Electoral Commission  <b>Cyrille Zogo Ondo</b>, Programme Specialist, International Organization of La Francophonie  <b>Professor Adebayo Olukoshi</b>, Regional Director Africa and West Asia, International IDEA  <b>General Siaka Sangaré</b>, President of RECEF, Executive Officer for Elections in Mali  <b>Jorge Santos</b>, President of the National Assembly of Cabo Verde</p>
10:15	Group photograph	
10:30	Coffee/tea break	
10:55	Overview of the workshop agenda	
11:00	<b>Panel 1: Overview of the past decade of the use of technology in electoral processes</b>	<p>Over the past decade, new information and communication technologies (ICTs) have been introduced in electoral processes around the world. A number of countries have turned to new technological solutions to improve the integrity of electoral processes and build stakeholder confidence at each stage of the electoral cycle. The introduction of ICTs into the electoral process is generating interest, but also concerns, among voters and election professionals around the world. This workshop proposes to take stock of the technologies used in the electoral cycle, mainly in Africa, but also in Europe and North America. It reviews the trends and presents the issues and lessons learned from the past decade of technological innovations in electoral processes.</p> <p><b>Moderator</b>          Badrieh M. A. Al-Balbisi, Secretary General of the Network of Arab EMBs</p> <p><b>Overview of the use of new technology in elections around the world</b>          Peter Wolf, Technical Manager, International IDEA</p> <p><b>Examples of technological innovations in West Africa</b>          Mathias Houunkpe, Programme Administrator for Democratic Governance, OSIWA</p> <p><b>Integrating electoral technology: the Iraqi experience</b>          Abbas Sabah Qasim Al-Jawabir, Director of ICT, Independent High Electoral Commission of Iraq</p> <p><b>Key issues and lessons learned in the use of electoral technology</b>          Mike Yard, Electoral Expert, IFES</p>
13:00	Lunch	



14:30	<b>Panel 2: Utilizing ICTs in elections in the medium and long-term: taking stock of experiences regarding effectiveness, sustainability, maintainability and overall impact on the electoral process over time</b>	<p>The introduction of ICTs has had a great impact on the evolution of electoral processes. Electoral cycle planning is more complex, the cost of organizing elections has increased and the awarding of major contracts to international companies has become a reality in many countries. The purpose of this panel is to identify fundamental principles that must be respected to ensure the integrity of the electoral process and to foster stakeholder confidence. Based on the experiences of the last decade, it sets out conditions for the introduction of efficient and sustainable technologies.</p> <p><b>Moderator</b> Hery Rakotomanana, Chairperson, Independent National Electoral Commission of Madagascar</p> <p><b>An extensive track record of using technology in elections: the case of the Philippines</b> Al Pereno, Member of the Commission for Elections (COMELEC) in the Philippines</p> <p><b>Voter registers and ID cards in Mali: the experience of recent years</b> General Siaka Sangaré, President of RECEF and Executive Officer for Elections in Mali</p> <p><b>The use of technology in elections in Cabo Verde: overview and prospects for the future</b> Maria Do Rosário Lopes Pereira Gonçalves, Chairperson of the National Electoral Commission of Cabo Verde</p> <p><b>The impact of new technology on the electoral cycle: the case of Brazil</b> Elmano Amancio De Sa Alves, Management Support Advisor, ICT Department, Superior Electoral Court of Brazil</p>
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## Day 2: Thursday 23 November 2017

8:30	<p><b>Panel 3: The decision-making process when adopting new technology in the electoral process: feasibility studies, needs assessments, security, evaluation and other factors leading to a final decision</b></p>	<p>This panel aims to discuss the decision-making process leading to the introduction of a new technology in the electoral process. In some countries, technologies have been introduced without preliminary studies, which has sometimes led to a decline in confidence in electoral processes. This panel will present the different stages that should comprise the decision-making process as well as the principle factors to consider. An evaluation analysis framework, which could be used as a decision support tool, will be presented to the participants.</p> <p><b>Moderator</b> Catherine Lagacé, Secretary General of RECEF and Director General of Elections in Quebec</p> <p><b>From identifying goals to proposing solutions: steps in the decision-making process</b> Karine Morin, Chief of Staff, Elections Canada</p> <p><b>Feasibility studies and evaluation of potential solutions: the introduction of e-voting in Namibia</b> Urich Freyer, Commissioner, Electoral Commission of Namibia</p> <p><b>Factors to consider in vendor selection: the case of Guinea</b> Advocate Amadou Salif Kébé, Chairperson, Independent National Electoral Commission of Guinea</p> <p><b>Political and Legal issues in IT and technological security in the Romanian electoral process</b> Cristian-Alexandru Leahu, Chief of Legislative Department, Permanent Electoral Authority of Romania</p>
10:30	Coffee/tea break	
11:00	<p><b>Panel 4: The procurement of electoral technology and national capacity building in the maintenance of technological solutions</b></p>	<p>Once a decision to adopt technology to improve the electoral process has been made, the best option at the best price must be selected. Good planning is therefore essential at each stage of the procurement process. Furthermore, the successful introduction of new technology requires good planning within the electoral management body that is responsible for conducting elections, in order to properly supervise all aspects of the work needed. This panel aims to better understand the principles and guidelines to be followed during the procurement process. The panel will also present good practices to adopt in order to foster successful technological integration, while ensuring the development of in-house expertise and the maintenance of technology between election cycles.</p> <p><b>Moderator</b> Thiago Fini Kanashiro, Chief Advisor for Electoral Management, Superior Electoral Court of Brazil</p> <p><b>Management and maintenance of technological solutions in Mauritania</b> Mohamed Ould N'Tilitt, Director of ICT and Voter Register, Independent National Electoral Commission of Mauritania</p> <p><b>The role of electoral management bodies in the development of technological expertise: the case of Quebec</b> Sébastien Allard, Director of Information Resources, Elections Quebec</p> <p><b>Case study: Jordanian procurement of electoral technology</b> Mahmoud Zain, Director ICT, Independent Electoral Commission of Jordan</p>
13:00	Lunch	



14:30	<b>Panel 5: Elections and technology in the coming decade: emerging trends and innovations</b>	<p>The last decade has seen the introduction of biometrics across swathes of Africa and new voting mechanisms such as the adopting of e-voting in some countries. This is a good time to assess emerging trends and discuss how they can improve electoral processes in the coming decade. At the same time, possible cyber fraud is a concern in several countries that are evaluating the best approaches to prevent interference or electoral fraud. This panel will discuss the future of certain technologies and present the new trends that are coming to light.</p> <p><b>Moderator</b>          Maria Do Rosário Lopes Pereira Gonçalves, Chairperson, National Electoral Commission of Cabo Verde</p> <p><b>Voter registers and voter ID cards in Senegal: procurement of technology and national expertise</b>          Issa Sall, Commissioner, Autonomous National Electoral Commission of Senegal</p> <p><b>Emerging trends in electoral technology</b>          Fabio Bargiacchi, Executive Director, European Centre for Electoral Support</p> <p><b>Technological improvements to watch: the South African approach</b>          Melanie Du Plessis, Manager, ICT Systems, Electoral Commission of South Africa</p>
16:30	Coffee/tea break	
17:00	<b>Summary of workshop findings and recommendations</b>	

## Annex C. List of participants

Country/organization	Name/Title
BENIN	Freddy Thierry Hougbedji Commissioner responsible for External Relations, Recruitment of Election Officials and Archives, Autonomous National Electoral Commission, Cotonou, Benin
BOTSWANA	Dintle Sparkie Rapoo Chief Information and Education Officer, Independent Electoral Commission, Gaborone, Botswana
BRAZIL	Thiago Fini Kanashiro Chief Advisor for Electoral Management, Superior Electoral Court, Brasilia, Brazil  Elmano Amancio De Sa Alves Management Support Advisor, ICT Department, Superior Electoral Court, Brasilia, Brazil
BURKINA FASO	Newton Ahmed Barry Chairperson, Independent National Electoral Commission, Ouagadougou, Burkina Faso  Nouroudine Tall Director of ICT and Voter Register, Independent National Electoral Commission, Ouagadougou, Burkina Faso
BURUNDI	Annonciate Niyonkuru Vice-Chair, Independent National Electoral Commission, Bujumbura, Burundi
CAMEROON	Enow Abrams Egbe Chairperson, Elections Cameroon, Yaoundé, Cameroun  François Owoutou Bornaud Executive assistant, Elections Cameroon, Yaoundé, Cameroun
CANADA	Jacques Mailloux Executive Director—Polling and Innovation, Elections Canada, Gatineau, Canada  Karine Morin Chief of Staff, Elections Canada, Gatineau, Canada
CABO VERDE	Maria Do Rosário Lopes Pereira Gonçalves Chairperson, National Electoral Commission, Praia, Cabo Verde
CENTRAL AFRICAN REPUBLIC	Marie-Madeleine N'kouet Hoornaert Chairperson, National Electoral Authority, Bangui, C.A.R.  Julius Rufin Ngouade-Baba Rapporteur, National Electoral Authority, Bangui, C.A.R.
CHAD	Dr Ahmat Ali Hissein Director General, Permanent Office for Elections, N'Djamena, Chad



COMOROS	Said Mze Dafine Secretary General, Independent National Electoral Commission, Moroni, Union des Comores
CÔTE D'IVOIRE	Sourou Koné 1st Vice-Chair, Independent Electoral Commission, Abidjan, Côte d'Ivoire
DEMOCRATIC REPUBLIC OF THE CONGO	Corneille Nangaa Yobeluo Chairperson, Independent National Electoral Commission, Kinshasa, DRC
GABON	René Aboghe Ella Chairperson, Autonomous and Permanent National Electoral Commission, Libreville, Gabon  Guy Serge Essono Ndoh Advisor to the Chairperson, Autonomous and Permanent National Electoral Commission, Libreville, Gabon
GHANA	Isaac Kofi Asomaning Director of Monitoring, Evaluation and Research, Electoral Commission of Ghana, Accra, Ghana  Prince Oppong Kyekyeku Assistant Director, Information and Technology, Electoral Commission of Ghana, Accra, Ghana
GUINEA	Advocate Amadou Salifou Kébé Chairperson, Independent National Electoral Commission, Conakry, Guinea  Jacques Gbonimy Commissioner and Director of Training and Accreditation, Independent National Electoral Commission, Conakry, Guinea  Oumory Sano Treasurer, Independent National Electoral Commission, Conakry, Guinea
GUINEA-BISSAU	Idriça Djalo Deputy Executive Secretary, National Electoral Commission, Bissau, Guinea-Bissau  Braïma Tura Director of Statistics and IT, National Electoral Commission, Bissau, Guinea-Bissau
HAITI	Carlos Hercule Member of the Provisional Electoral Council, Port-au-Prince, Haiti  Roger Jean-Philippe Augustin Member of the Provisional Electoral Council, Port-au-Prince, Haiti
IRAQ	Abbas Sabah Qasim Al-Jawabir ICT Director, Independent High Electoral Commission, Baghdad, Iraq
JORDAN	Mahmood Zain ICT Director, Independent Electoral Commission, Amman, Jordan
LIBYA	Aladdin Ahmed Taher Sooni Web Developer, High National Electoral Commission, Tripoli, Libya  Abdulathim Faraj Misbah Aqeel Web Developer, High National Electoral Commission, Tripoli, Libya
MADAGASCAR	Hery Rakotomanana Chairperson, Independent National Electoral Commission, Antananarivo, Madagascar
MALI	Général Siaka Sangaré President of RECEF, Executive Officer for Elections in Mali, Bamako, Mali  Évariste Fousseï Camara Commissioner, Independent National Electoral Commission, Bamako, Mali
MAURITANIA	Mohamed Ould N'Tilitt Director of ICT and the Voter Register, Independent National Electoral Commission, Nouakchott, Mauritanie

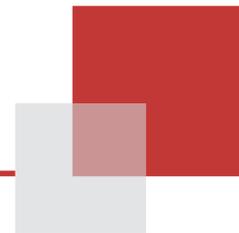
MAURITIUS	Dharmajai Mulloo Assistant to the Director General of Elections, Office of the Electoral Commissioner, Port Louis, Mauritius
MOZAMBIQUE	Apolinario Joao Commissioner, National Electoral Commission, Maputo, Mozambique
NAMIBIA	Ulrich Freyer Commissioner, Electoral Commission of Namibia, Windhoek, Namibia
PHILIPPINES	Al Pereno Member of the Commission, Commission on Elections (COMELEC), Manila, Philippines
PORTUGAL	Joao Almeida Commissioner, National Electoral Commission, Lisbon, Portugal
QUEBEC	Catherine Lagacé Secretary General of RECEF, Deputy to the Chairperson and Secretary of the Commission on Electoral Representation, Secretary General of the Office of the Director General of Elections in Quebec, Canada  Sébastien Allard Director of Informational Resources, Office of the Director General of Elections in Quebec, Canada  Simon Mélançon Advisor for International Cooperation, Office of the Director General of Elections in Quebec, Réseau des compétences électorales francophones (RECEF), Canada  Marie-Christine Ross Advisor for International Cooperation, Office of the Director General of Elections in Quebec, Canada
ROMANIA	Gabriel Sauca Director for Coordination of the Electoral and National IT System, Permanent Electoral Authority of Romania, Bucharest, Romania  Cristina Leahu Chief of Legislative Department, Permanent Electoral Authority of Romania, Bucharest, Romania
SAO TOMÉ-ET-PRINCIPE	Alberto Neto Pereira Chairperson, National Electoral Commission, Sao Tomé, Sao Tomé-et-Principe
SENEGAL	Doudou Ndir Chairperson, Autonomous National Electoral Commission, Dakar, Senegal  Issa Sall Commissioner, Autonomous National Electoral Commission, Dakar, Senegal
SOUTH AFRICA	Melanie Du Plessis Manager, ICT Systems, Electoral Commission of South Africa, Pretoria, South Africa
TUNISIA	Anouar Ben Hassen Acting Chairperson, High Independent Authority for Elections, Tunis, Tunisia
ECOWAS NETWORK OF ELECTORAL COMMISSIONS	Mariam Touré Programme Assistant, ECOWAS Network of Electoral Commissions
ELECTORAL COMMISSIONS FORUM OF SADC COUNTRIES	Hilda Modisane Coordinator, Electoral Commissions Forum of SADC countries, Gaborone, Botswana
EUROPEAN CENTRE FOR ELECTORAL SUPPORT (ECES)	Fabio Bargiacchi Executive Director, European Centre for Electoral Support, Brussels, Belgium
INTERNATIONAL FOUNDATION FOR ELECTORAL SYSTEMS	Mike Yard Electoral Technology Advisor and Chief of Party Libya Programme, International Foundation for Electoral Systems, Tunis, Tunisia



INTERNATIONAL IDEA	<p>Professor Adebayo Olukoshi Regional Director for Africa and West Asia, International IDEA, Addis Ababa, Ethiopia</p> <p>Brook Teshome Associate Programme Officer, Africa and West Asia, International IDEA, Addis Ababa, Ethiopia</p> <p>Nicholas Matatu Programme Officer, Africa and West Asia, International IDEA, Addis Ababa, Ethiopia</p> <p>Emna Zhongda Programme Officer, Africa and West Asia, International IDEA, Tunis, Tunisia</p> <p>Peter Wolf Technical Manager, Global Programmes, International IDEA, Stockholm, Sweden</p>
INTERNATIONAL ORGANIZATION OF LA FRANCOFONIE	<p>Zahra Kamil Programme Specialist, Department of Political Affairs and Democratic Governance, International Organization of La Francophonie, Paris, France</p> <p>Cyrille Zogo Ondo Programme Specialist, Department of Political Affairs and Democratic Governance, International Organization of La Francophonie, Paris, France</p>
OPEN SOCIETY INSTITUTE FOR WEST AFRICA	<p>Mathias Hounkpe Head of Governance Programme, Open Society Institute for West Africa, Dakar, Senegal</p>
ORGANIZATION OF THE ARAB ELECTORAL MANAGEMENT BODIES	<p>Badreya Belbissi Secretary General, Organization of the Arab Electoral Management Bodies</p>
UNITED NATIONS DEVELOPMENT PROGRAMME	<p>Dan Malinovich Electoral Assistance Specialist, United Nations Development Programme, Brussels, Belgium</p>

## About the organizations

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### International IDEA

The International Institute for Democracy and Electoral Assistance (International IDEA) is an intergovernmental organization with the mission to advance democracy worldwide, as a universal human aspiration and enabler of sustainable development. We do this by supporting the building, strengthening and safeguarding of democratic political institutions and processes at all levels. Our vision is a world in which democratic processes, actors and institutions are inclusive and accountable and deliver sustainable development to all.

In our work we focus on three main impact areas: electoral processes; constitution-building processes; and political participation and representation. The themes of gender and inclusion, conflict sensitivity and sustainable development are mainstreamed across all our areas of work. International IDEA provides analyses of global and regional democratic trends; produces comparative knowledge on good international democratic practices; offers technical assistance and capacity-building on democratic reform to actors engaged in democratic processes; and convenes dialogue on issues relevant to the public debate on democracy and democracy building.

Our headquarters is located in Stockholm, and we have regional and country offices in Africa, the Asia-Pacific, Europe, and Latin America and the Caribbean. International IDEA is a Permanent Observer to the United Nations and is accredited to European Union institutions.

<<http://idea.int>>

### Réseau des compétences électorales francophones

The Francophone Electoral Network (RECEF) is an association that regroups electoral commissions and administrators from across the French-speaking world. It works in close collaboration with the International Organization of La Francophonie (IOF). The idea of creating such a network originated in the late 1990s, when many countries in Africa and Eastern Europe held their first democratic multiparty elections. This commitment was reaffirmed in 2000 in Bamako, Mali, during the International Symposium on Democratic Practices, Rights and Freedoms in the Francophone world. It was during this important event that the Bamako Declaration was adopted. RECEF aims to encourage the regular holding of free, fair and transparent elections. To achieve this goal, it focuses on (i) supporting its members, contributing to their professional development, and assisting



members in the establishment of sustainable, neutral, autonomous and independent electoral institutions; (ii) promoting professionalism in electoral management through the exchange of experiences and good practices; (iii) promoting the full participation of the citizens in electoral processes; (iv) encouraging research on elections; (v) establishing and deepening partnerships with all institutions that have a similar mission to RECEF; and (vi) reflecting on emerging electoral issues and assisting members in addressing them. RECEF currently has 29 members and has produced many publications on elections.

<<http://www.recef.org>>

### **National Electoral Commission of Cabo Verde**

The National Commission for Elections of Cabo Verde (Comissão Nacional de Eleições, CNE) is the body responsible for electoral administration in Cabo Verde. The CNE was created as an independent and permanent body by the Law 112/IV/94 in 1994, ending the system of ad hoc commissions for each election. In 2007, its composition was amended, and its mandate broadened following the passage of Law 17/VII/2007. The CNE is responsible for organizing and supervising national and local elections in Cabo Verde. It also has an important civic mission in educating citizens about all aspects of the electoral process. The CNE has played an important role in the contributed to the development and consolidation of democracy in Cabo Verde.

<<https://www.cne.cv>>

### **International Organisation of La Francophonie**

The International Organisation of La Francophonie (Organisation internationale de la Francophonie, IOF) is an institution based on the sharing of the same language and common values. It currently has 77 states and governments, including 57 members and 20 observers, representing a total population of 900 million individuals. According to the 2010 French language report, there are 220 million French-speakers around the worldwide. Present on five continents, the IOF conducts political and cooperation initiatives in the following priority areas: the French language and cultural and linguistic diversity; peace, democracy and human rights; education and training; sustainable development and solidarity. In all its initiatives, the IOF pays particular attention to young people and women and to enabling access to information and communication technologies. The initiatives led by the Peace, Democracy and Human Rights Directorate aim to consolidate democracy, human rights and the state of law and help prevent conflicts and methods of getting out of a crisis, democratic transition and peacebuilding.

<<https://www.francophonie.org>>

Over the past decade, new technologies have been playing an integral role in the organization of an increasing number of elections around the world. A number of countries have turned to a variety of technological solutions in a bid to make elections more efficient and more cost-effective, and to strengthen stakeholder trust in each stage of the electoral cycle.

Solutions range from the use of geographic information systems to conduct boundary delimitation and establish the location of polling stations to the use of sophisticated databases to maintain the voter registers, mobile technology for the transmission of election results or electronic voting machines to enable citizens to cast their ballots.

This report documents a workshop on the use of technologies in electoral processes organized jointly by International IDEA and the Francophone Electoral Expertise Network (Réseau des compétences électorales francophones, RECEF) in partnership with the National Electoral Commission of Cabo Verde and with the support of the International Organization of La Francophonie.