Introduction and Background

The increasing use of new electronic voting (e-voting) technologies in elections around the world has been recognized by the international election observation community as one of the paramount challenges facing election observation today. As a whole, international election observation organizations have had relatively little experience observing elections in which e-voting technologies are used. In addition, the inherent lack of transparency of electronic voting technologies discourages easy observation.

E-voting systems thus pose important and unique challenges for election observers: How can observers assess the workings of electronic systems where the processes of vote counting and tabulation are often invisible? What aspects of traditional observation remain relevant for e-voting observation? What can and should be observed in the automated or e-voting systems? What are the critical and essential access points in e-voting processes that observers need in order to assess the integrity of the voting exercise? Does e-voting present new dynamics or challenges for the interrelationships between relevant stakeholders such as vendors, legislators, election officials, and others? Are there unique legal or legislative implications for e-voting systems?

To address some of these questions, The Carter Center has embarked on a two-year initiative aimed at developing an effective methodology for observing elections in which electronic voting technologies are used. On Nov. 2, 2006, The Carter Center hosted the first activity of this initiative—a small workshop of representatives of election observation organizations and e-voting experts aimed at fostering collaborative discussion and the development of a draft methodology for observing electronic voting. This meeting, called "Developing a Draft Methodology for Observing Electronic Voting Technologies," built on the results of a previous workshop hosted by the Center in 2005 on the challenges posed by electronic voting technologies.

Shortly after the November 2006 meeting, The Carter Center deployed a specialized technical mission to Venezuela to observe the use of electronic voting in its Dec. 3, 2006, presidential election and to conduct a preliminary field test of the methodology. Following the Venezuela mission, Carter Center staff and consultants worked to update and revise the methodology. The Center plans to test the draft methodology in at least two additional pilot missions.

This short document, with the attached revised draft observation forms, summarizes the discussions of the November 2006 meeting, the methodological findings of the technical mission to Venezuela, and subsequent efforts by Carter Center staff to revise the draft methodology for observing electronic voting.[1]

Summary of November 2006 Meeting

Perspectives on Electronic Voting: Professor Douglas Jones

In advance of the November 2006 meeting, The Carter Center developed a draft methodology for review by meeting participants. This methodology served as the basis of discussion during the meeting. As an introduction and overview to the topic of electronic voting technologies, professor Doug Jones of the University of Iowa opened the meeting with a short presentation on the ways in which different perspectives on the use of electoral technologies can help to identify openings and opportunities for more meaningful observations.[2] According to Dr. Jones, it is helpful to understand the path of the voting machine through several cycles—the election cycle, the life cycle of the machine itself, and the cycle of data flow

Note. The Carter Center gratefully acknowledges the government of Ireland, Jim Stanard, Cherida Smith, and the Hughes Foundation, whose generous support makes the Center's election standards project possible.

1 This report was written by Avery Davis-Roberts, program associate in the Carter Center's Democracy Program.

2 http://www.cs.uiowa.edu/~jones/

between different equipment and software and different physical locations. The next several sections summarize the main points of Dr. Jones' presentation and the discussion among meeting participants.

Election Cycle

Pre-election tests and audits are an optimal opportunity for international election observers to assess not only the functioning of the electronic voting system but also the access of key stakeholders to the electoral process, including the technologies in use. However, when considering the election cycle, there are various factors that limit the extent and effectiveness of pretesting and auditing of the electronic voting system.

First, there is often political pressure to extend the candidate registration period. If candidates are allowed to register at a later date, the period between candidate registration and election day may not be long enough to conduct the proper audits and tests. Shorter testing periods translate into shorter periods for correcting any detected errors or flaws in the electronic voting system, which can result in serious problems that must be resolved in an unrealistically short period of time.

A second important factor is the location and chain of custody of machines throughout the election cycle. Election observers should pay particular attention to the chain of custody of the machines, especially once they have been distributed from the central warehouse, where testing likely takes place, to the polling places. Once the machines are deployed to the polling places, physical security measures become paramount as transportation and in-polling-place storage provide a significant opportunity for tampering to take place. Because testing of the machines does not usually occur once the machines are distributed to the polling place, observing the chain of custody becomes the most effective means of ensuring that the equipment has not been tampered with or that any tampering that does occur is evident and that proper procedures are followed.

Third, after election day has concluded, voting information must be transmitted to the central tabulation system. The actual collection of the results from the voting machines usually involves the use of modems, memory sticks, and other electronic devices. Depending on the electoral body, there may or may not be postelection audits that check the accuracy of the tabulated vote. These postelection audits would ideally occur before the official results have been announced and would be another opportunity for election observers to assess the efficacy and inclusiveness of the procedures in place.

Machine Life Cycle

The machine's life cycle begins with the invention of the voting equipment and ends when the machines are finally retired from use. Ideally, the first election employing a new voting technology will be a minor election with a low number of voters because there are almost always significant glitches associated with the first deployment of a technology.

Before the voting machines are used in an election, the electoral jurisdiction should assess whether the machine meets not only a set of recognized certification standards for electronic voting systems, but also the particular requirements of the election taking place and of the jurisdiction in which that election will occur. A jurisdiction may have different requirements for a voting machine depending on various factors, including whether the jurisdiction is rural or urban, the number of registered voters, and so forth.

Ideally, an independent body will be responsible for the certification of the technology and will determine whether or not the machine has met the standards set for e-voting technologies. In the United States, independent testing authorities (ITAs) perform this function. These laboratories are private companies that have been accredited by the U.S. Election Assistance Commission. However, the extent of a testing authority's actual independence is dependent to a large degree on the electoral body and the voting machine vendor. In the United States, for example, the ITAs often are paid to test the equipment and software by the voting machine vendor, potentially compromising the legitimacy of the certification process.

Observers should seek to answer the following questions when considering the certification process: What are the certification standards for a particular jurisdiction? Are these standards public information?

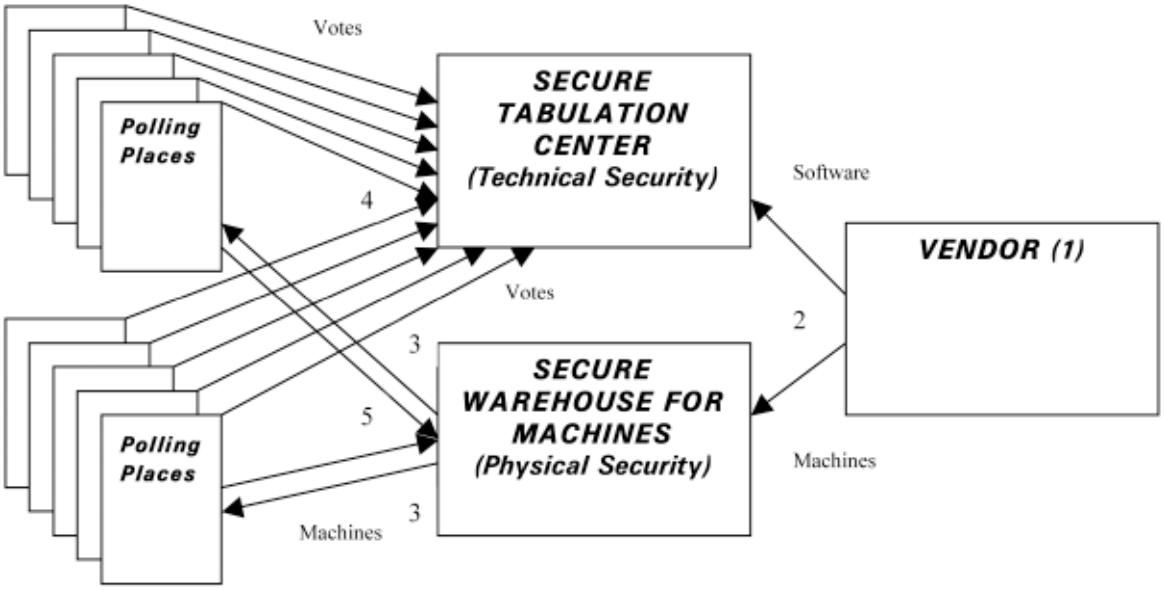
Is the process for certifying electronic voting systems transparent?

After the machine has been independently certified and accepted by the electoral body, the decision to deploy the technology can be made. At that point, election officials and poll workers must be trained to operate and use the machines. If the decision to deploy the technology is made too late, the amount of time available to test the machines, to properly train poll workers and election officials on their use, and to familiarize the electorate with the technology may be condensed to the detriment of the electoral process. Observation of the training of poll workers, election officials, and the electorate must be a central component of any e-voting observation methodology.

Cycle of Data Flow

When considering e-voting, observers should try and identify all the delivery paths of information between various software programs and equipment. Understanding the expected flow of information will help observers to identify potential opportunities for manipulation of the system and to assess whether adequate security procedures (both technical and physical) have been put in place. The cyclical flow of information and equipment between the vendor, the tabulation center, the warehouse, and the polling places requires that a certain level of security be implemented at each exchange of information to ensure that the system is, at least, tamper-evident. Figure 1 summarizes the cycle of data flow.

Figure 1: Cycle of Data Flow



1. Vendor produces equipment and software.
2. Machines and software are delivered to the warehouse and tabulation centers—***data flow between vendor and tabulation center and warehouse***.
3. Machines are then deployed to polling places—***data flow between the polling place and the warehouse.***
4. On election day, votes are cast and then the election results are sent to the tabulation center—***data flow between the polling place and the tabulation center.***
5. After the election, the equipment is returned to the warehouse for storage—***data flow between the polling place and warehouse.***

There are two components for providing proper security during the various exchanges in the cycle: physical security and technical security. Physical security measures often include documented chains of custody to certify that each person involved in the process performed the proper protocol for the delivery and transfer of equipment and data. Technical security, on the other hand, usually involves cryptography to ensure that the software and the machines cannot be tampered with. The need for observers to focus exclusively on technical security measures generally occurs only if the physical security procedures have proven inadequate.

The methods used for transferring data from the polling centers to the tabulation center and for finally tabulating the votes can also present a significant challenge to observation and auditing. Most tabulation centers are set up with individual technicians sitting in front of computers, making it very difficult to observe the work that they are actually performing. The method for observing at the tabulation center must be fundamentally different from the way that the rest of the electoral process is observed.

International Standards for Electronic Voting

During discussion at the November 2006 meeting, there was general agreement among the participants that consideration of the legal framework is an especially important aspect of observing electronic voting and that the right of key stakeholders to have access to complaints procedures and other effective legal remedies becomes even more critical when new technologies are introduced. Several participants suggested that developing international standards for electronic voting technologies could give observers the tools necessary to assess both the legal framework of a particular country's elections and the electronic voting system. The Council of Europe's Standards for Electronic Voting Systems are one example of international standards.[3]

It was suggested that by working toward more harmonized methodologies for observing electronic voting, the election observation community is helping to articulate standards for e-voting based on widely accepted democratic principles, such as transparency and accountability. The Council of Europe recommendations go a step further and begin to tie those emerging standards to international law.

More generally, members of the group questioned whether electronic voting could ever be completely observable. Proprietary issues and nondisclosure agreements between the vendor and the electoral body can add to the opacity of electronic voting systems.

Technical Expertise

Meeting participants agreed that there is a general shortage of people, in both developing and developed countries, who have the technical expertise not only to observe all aspects of the electronic voting process but also to work with electoral commissions to adequately administer electronic elections. A few members of the group suggested that the gap between the knowledge of the technicians who run the election and that of the electorate could become so wide as to make the processes of electronic voting completely opaque to observation. In such circumstances, the ability of the general public to lodge complaints or legal challenges would be severely eroded. Similarly, political parties also suffer from a lack of technical capacity to observe electronic voting. There was a general consensus that political parties should be trained to observe electronic voting; one concrete suggestion for a next step was the creation of training programs for political party agents and other key stakeholders on voting technology.

3 http://www.coe.int/t/e/integrated%5Fprojects/democracy/02%5FActivities/02%5Fe%2Dvoting/