



Electronic Transaction Standards for Voting Systems

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Two Key Issues

The current revision of the Voluntary Voting System Guidelines (VVSG) reflects a desire to incorporate many of the lessons learned from recent science and experience related to voting technologies. Not surprisingly, the proposed VVSG now contain extensive sections related to security and usability. These efforts are to be commended: security and usability are critical components of any effective voting system.

However, the sharp focus on voting systems and the various controversies related to security and usability have created several gaps in the VVSG that I would like to address today. Today, I would like to focus on two of those gaps:

1. The need for all voting system components to be completely interoperable in order to facilitate data exchange; and
2. The need for the VVSG to cover voter registration systems.

Much of my testimony today is based on a report I recently co-authored with Michael Alvarez, Professor of Political Science at Caltech and co-director of the Caltech/MIT Voting Technology Project. The report, which will be released in the next month by the IBM Center for the Business of Government, is entitled *The Next Big Election Challenge: Developing Electronic Data Transactions Standards for Election Administration*.

Interoperability and Data Exchange

Our world of electronic technology—from email to the Internet—works because of the existence of basic standards of data exchange. In many areas of commerce and government there exist electronic transaction standards (ETS) that facilitate electronic data interchanges (EDI). An EDI provides a defined format for the exchange of data for every specific transaction in question. These standards allow for there to be a marketplace full of different products and services that give end-users the ability to communicate with other users who also purchase software with the same EDI.

Currently, there are no electronic transaction standards included in the VVSG. The lack of standards to facilitate data exchange has several ramifications.

- **First, it is difficult for a local election official to integrate election management and voting products acquired from different vendors into a single unit, making any sort of “plug-and-play” or modular approach impossible for election systems.** It is difficult for a local election official to integrate various election management and voting products acquired from different vendors into a single unit. For example, an election official would be hard pressed today to get one vendor’s ballot design product to work with a different vendor’s electronic voting equipment, or to get one vendor’s electronic voting equipment to work with a different vendor’s tabulation product. The lack of a electronic transaction standards severely limits “plug-and-play” or modular approaches for the development of election administration electronic solutions, making the electronic voting system market dysfunctional. Having no standard for ETS is a barrier to market entry for companies, and a barrier to local election officials as they attempt to build the best voting systems possible.
- **Second, the lack of data exchange standards affects the ability of states to develop truly integrated voter registration systems.** The Help America Vote Act (HAVA) requires states to develop electronic, statewide voter registration databases. Therefore, states are now integrating voter registration data from local election officials (typically counties) into these new databases, a process that is raising the issue of inconsistent data formats for this particular component of election administration. Also, the statewide voter registration files, once complete, must integrate with other databases, most importantly state Department of Motor Vehicles files, federal Social Security Administration databases, as well as existing election administration databases in each state and county. Some election officials have even talked about setting up mechanisms so that states can share election administration data, for example, so that they can check the authenticity of newly registered voters and verify that they are not currently registered to vote in another state.
- **Third, the lack of election data transfer standards hinders the capabilities of election administrators and others to produce consistent and effective post-election audits of election practices and procedures.** Currently, the quality and consistency of information reported by election administrators is highly variable; it can be exceedingly difficult for third-parties interested in auditing election practices and procedures to obtain

even rudimentary data from many state and local election officials. By developing a standard format for data exchange, all election data would be reported uniformly. Additionally, election administrators will be able to move easily and efficiently report election administration information that can be used to appropriately audit election practices and procedures.

Having an ETS for public elections would improve all aspects of election management. An ETS would allow election management systems to communicate seamlessly and share data to create a more accurate, cost-effective, and accessible election process and voting experience. Fortunately, there are several ongoing efforts to create uniform standards for exchanging election data. The first is being conducted under the auspices of the Organization for the Advancement of Structured Information Standards (OASIS) and uses an interoperable Election Markup Language that would facilitate data exchange. The second is being developed by the Institute of Electrical and Electronics Engineers (IEEE). Both of these are open collaborative efforts that bring together experts from around the world to develop these new standards. Regardless of whether either of these two protocols is adopted (or a new protocol is developed and adopted), the move to an ETS will streamline election data transfer. An ETS can encourage innovation in election management by increasing competition and lowering barriers to entry and also facilitate local and state election officials who want to add new services that can expand the franchise to traditionally disenfranchised populations.

The Election Assistance Commission can facilitate the creation of comprehensive standards for electronic data transmission by:

- working with IEEE, NIST, OASIS, and others to develop a standard ETS for election data;
- including a requirement for voting systems to have a common electronic data exchange component in the revised VVSG;
- including a similar requirement in the guidance given to states regarding what makes a statewide voter registration system compliant with the Help America Vote Act (HAVA).

Additionally, if such a standard is required for voting and voter registration systems, the EAC should consider developing a process to encourage states to share voter registration data to improve the maintenance of voter registration rolls.

Electronic Transaction Standards in E-Government: The Case of HIPAA

An effort by the EAC to develop and report electronic transaction standards would be in keeping with recent federal activities in the area of ETS. A key example of the role that the federal government can play in developing ETS for software and e-government systems in a given policy area are the requirements under the Health Insurance Portability and Accountability Act of 1996 (HIPAA). HIPAA is generally considered to be one of the most sweeping changes to federal health care policy since the passage of the Medicare Act in 1965. One of the most sweeping provisions in HIPAA is a data exchange requirement whereby all covered health care related organizations, as well as entities who exchange data with a HIPAA covered organization, are required to use a common data exchange format. Under HIPAA, all covered healthcare-related organizations, as well as entities that exchange data with a HIPAA-covered organization, are required to use a common data exchange format.

An EDI overcomes these problems by allowing data transfers to be done with very low cost, because the data exchange occurs instantaneously and without human intervention. Without an EDI, humans must fill the communication gap that exists between incompatible computers. The benefits of the HIPAA ETS requirement are numerous. Some of the more obvious ones are:

- Reduced administrative costs
- Instantaneous transmission of claims and other data
- Improved accuracy in information transmission
- Integration of provider transactions into an entity's overall administrative framework
- Increased security, as fewer individuals have to handle the data when it is transferred.

There are other, less obvious benefits to having these standards. One study notes that ETS can facilitate corporate synergies among software development and systems implementation firms, as well as among healthcare firms. Companies now have incentives to cooperate in the development of new products, since they have to use a common ETS. Likewise, EDI features provide companies with

incentives to share appropriate data to improve healthcare outcomes, in addition to improving claims processing and benefits delivery. Because a standard set of codes will be used for the processing of health information, the reliability of this data will be increased across providers. No longer will a given illness, procedure, or treatment be coded and labeled differently by different healthcare claims payers or providers.

The benefits described above could all accrue to election officials and election equipment vendors should the EAC adopt electronic transaction standards. Election administration would be more efficient and effective were the EAC to require ETS in the VVSG.

Voter Registration Standards

The VVSG explicitly cover voting technologies, as well as election management systems. For some reason, the guidance does not address the beginning of the election management process—which is voter registration—even though voter registration (VR) is becoming a completely integrated part of election management. Moreover, the VVSG do explicitly cover items that are functions of voter registration, so it is not a stretch to wonder why the VVSG does not cover VR in its entirety.

Section 1.5.1. (Voting System) states that “A voting system...includes the software required to program, control, and support the equipment that is used to define ballots...” For the voter casting a ballot in an election, ballot definition is determined by their registration. In certain primary elections, for instance, the voter’s registration indicates which party ballots they are eligible to choose among and then vote. In all elections, voter registration determines which races are on the ballot that the voter is given (or sent, in the case of by-mail voting).

Today, voter registration systems are also interfacing directly with electronic voting technologies. For example, new technologies allow poll workers to use electronic poll books to activate the voter card that determines the specific ballot style the voter receives. Even in non-electronic voting contexts, voter registration is an integral part of the voting process, yet there are not standards for these databases. Again, this is also a reason for having electronic data transaction

standards, so that state voter registration systems can be interoperable with all voting technologies.

Why is it important for the VVSG to cover voter registration? It is important because voter registration is the point at which, historically, it has been easiest to disenfranchise voters. VR is also one of the places where questions about fraud are often raised. And with VR increasingly involving dynamic electronic systems, the issues of security, interoperability, quality assurance, and functional requirements that are the centerpiece of the VVSG are critical as well to VR. VR is moving from being a people process to an electronic process; therefore, you need standards, certification, and testing of these electronic processes. Voter registration files are the backbone of the election administration process, and we are running the risk that these electronic databases may not be reliable, secure, or private. A failure in a VR database would be much more catastrophic than a failure of a voting system, since VR is the first part of the voting chain. You simply cannot run an election in the United States without accurate and well-managed voter-registration data.

The EAC should bring voter registration under the VVSG and create testing and certification processes for voter registration systems that mirror those used for voting technologies.

Background on Thad Hall

I am currently an Assistant Professor of Political Science at the University of Utah and a research fellow at the University's Center for Public Policy and Administration. I have a Ph.D. in political science from the University of Georgia, a MPA from Georgia State University, and a B.A. from Oglethorpe University. I study election administration and public policy, and have written two books and several articles in these areas. I am currently completing a book on the electronic voting controversy, which should be available in the late summer 2006.

Of special interest to the EAC members is a report I have co-authored with Michael Alvarez entitled *The Next Big Election Challenge: Developing Electronic Data Transactions Standards for Election Administration*. This report will be released in the next month by the IBM Center for the Business of Government.

Before coming to the University of Utah, I worked for The Century Foundation, where I worked on issues related to election reform, including serving on the professional staff of the National Commission on Federal Election Reform and on the Secure Electronic Registration and Voting Experiment (SERVE) evaluation team. I have since been involved in several election reform conferences and activities, including events sponsored by the American Association for the Advancement of Science, the Kennedy School of Government, and the American Political Science Association's Working Group on the Mechanics of Voting. I am also a collaborator with the Caltech/MIT Voting Technology Project and have testified before the United States Senate Judiciary Committee on election-related issues.