

An OASIS White Paper

Requirements for common data formats and standards for e-Voting

The OASIS View

Submitted for NIST Workshop on a Common Data
Format for Electronic Voting Systems

Abstract

Voting is one of the most critical features in our democratic process. In addition to providing for the orderly transfer of power, it also cements the citizen's trust and confidence in an organization or government when it operates efficiently. Society is becoming more and more web / collaboration oriented, and citizens, used to the high degree of flexibility in the services provided by the private sector and in the Internet in particular, are now beginning to set demanding standards for the delivery of services by governments using modern electronic delivery methods.

The implementation of electronic voting would allow increased access to the voting process for millions of potential voters. Higher levels of voter participation will lend greater legitimacy to the electoral process and should help to reverse the trend towards voter apathy that is fast becoming a feature of many democracies. It is also recognized that more traditional voting methods will exist for some time to come, so a means is needed to make these more efficient and integrate them with the newer electronic methods.

In the election industry today, there are a number of different services vendors around the world, all integrating different levels of automation, operating on different platforms and employing different architectures. With the global focus on e-voting systems and initiatives, the need for a consistent, open, auditable, automated election system has never been greater.

This paper responds to the Call for Participation from NIST for their workshop on common data formats and shows how the use of such common formats and open standards can provide the facilitation for trusted electronic voting systems. Included is an assessment of the minimum functional mechanisms which ensure audit trail and crosschecking thus allowing verification of voting to be implemented.

The Challenge

It is extremely unlikely that in the future elections will not have some e-enabled component(s). It's probably more a question of how many components and when they are introduced. But there are still many concerns to be allayed and a good deal of confidence that needs to be built before e-voting becomes the norm. Open standards are the base on which to build future e-enabled elections that will be trustworthy, open and creditable.

How to facilitate Trust

Since democracy was invented people have sought to "influence" the result of a vote. The goal has to be to reduce the risk that people will use the computer technology introduced into the process to "cheat" in new and interesting ways that were previously not available. Also computer technology should remove old ways of cheating and therefore minimize the risks that were there previously.

People should be able to transparently understand how the computer is handling their information and vote and have the means to independently verify that and hence be confident in and embrace the process.

Essentials for Trusted Voting

There are a number of essential principles which if followed should ensure trusted voting:

- Apply the right businesses rules, in a consistent set of processes, using common data;
- Use of open public specifications is essential;

- Independent verification and inspection is vital;
- Each new situation brings its own challenges – no one-size fits all / in-country localization;
- Broad availability of proven infrastructure;
- Auditability within an Electoral Assurance Framework.

Auditability

Transparency and Auditability are key electoral requirements. Using open interfaces can provide transparency of the whole voting process from the time the votes are cast to the final count. Full scale deployment of systems within an Electoral Assurance Framework incorporating standards provides:

- Secrecy of the voter and their vote;
- Transparency, verifiability and auditability of the whole election;
- “Comfort” to the voter.

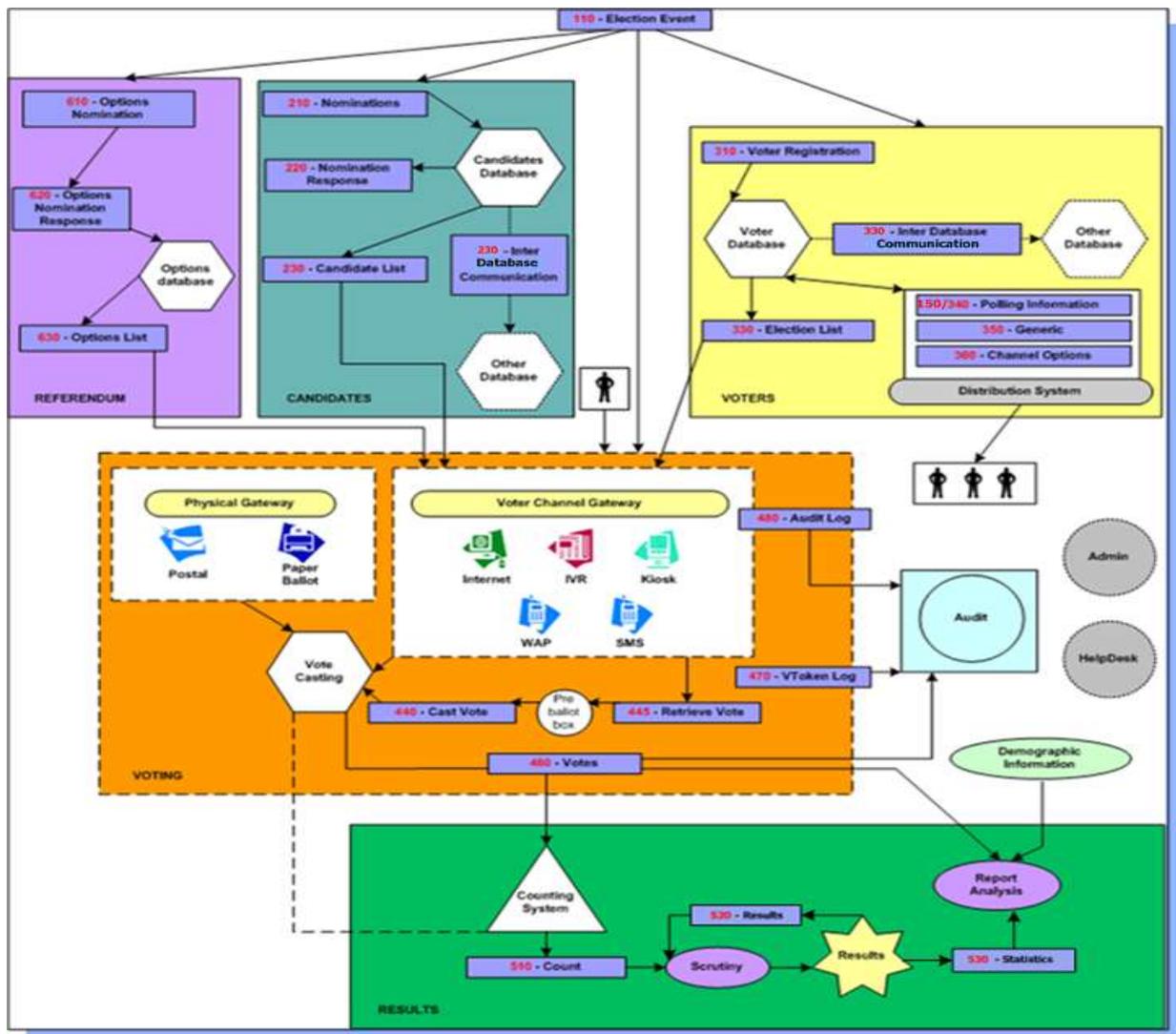
An Electoral Assurance Framework:

- Provides for Accreditation, Assessment and Certification of electoral systems and services;
- Builds trust by enabling public verifiability of the whole voting process;
- Needs to be based on open standards;
- Provides standardised interface points where vote auditing processes can be independently assessed under the Assurance Framework.

Why Interface Standards

In any election there is a need for information and data to be exchanged at several points in the end to end process. Almost certainly this will involve several parties, be they officials in different organisations, or ICT systems operated by these various organisations. As a result there is a need to secure interoperability between dissimilar systems and equipment. The exchange of this information and data has to be an open and transparent process using consistent data.

Throughout the end to end process there are a number of Interface Points as depicted in the following diagram:



The OASIS EML Standard

To meet the requirements for trusted voting set out above, EML (Election Markup Language) has been developed as a standard for the structured interchange of data among hardware, software, and service providers who engage in any aspect of providing election or voter services to public or private organisations. The objective has been to introduce a uniform and reliable way to allow systems involved in the election process to interoperate. Our overall effort attempts to address the challenges of developing a standard that is:

- **Multinational:** Our aim is to have these standards adopted globally.
- **Flexible:** Effective across the different voting regimes (e.g. proportional representation or ‘first past the post’) and voting channels (e.g. Internet, SMS, postal or traditional paper ballot).
- **Multilingual:** Flexible enough to accommodate the various languages and dialects and vocabularies.
- **Multimedia:** able to support disabled and non-visual voting access methods.

- **Adaptable:** Resilient enough to support elections and referenda in both the private and public sectors.
- **Secure:** Able to secure the relevant data and interfaces from any attempt at corruption, as appropriate to the different requirements of varying election rules.

EML provides specifications for (1) Candidate Nomination, Response to Nomination and Approved Candidate Lists; (2) Voter Registration information, including eligible voter lists; (3) Various communications between voters and election officials, such polling information and election notices; (4) Logical Ballot information, including races, contests, and candidates; (5) Voter Authentication; (6) Vote Casting and Vote Confirmation; (7) Election counts, results and statistics; (8) Audit information pertinent to some of the other defined data and interfaces.

The EML standard consists of tried and proven XML formats. As such it provides a comprehensive set of tools for implementing digital electronic voting. The content of the EML records has also been designed to operate in a wide variety of election methods and ballot systems. In addition it can be incorporated into wider methods that seek to provide trusted voting systems. Such systems may combine both paper and e-Voting devices together to provide voter verifiable processes. The EML XML provides an excellent foundation for implementing auditable records from multiple sources within such a trusted operational model. Furthermore because EML provides a “lingua franca” between election systems and devices it can allow implementers to choose from a wider set of providers’ equipment to build with.

Conclusions

Technology will not go away; future generations will demand its use in every facet of their daily lives including voting. Open standards are the base on which to build future e-enabled elections that will be trustworthy, open and creditable. Using consistent data and exchanging that at recognised interface points is essential for trusted elections. EML meets all known election requirements and is the only available international open standard that can meet the needs of elections officials and provide comfort to the voter.

OASIS Election & Voter Services Technical Committee

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