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Requirements for Geo-Districting and Polling Place Standards

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Format for Electronic Voting Systems

Abstract

The OASIS Election and Voter Services Technical Committee (OASIS Election TC) has developed the new Election Markup Language (EML) V6.0 including the new EML 150 schema for geo-district and polling place information.

We discuss here the goals, capabilities and potential for this new standard information component for elections and voter services support.

Customer and Services Focus

Given the myriad local variations currently in election statues and laws, one challenge is providing open standards and specifications that can be utilized across all 50 states and jurisdictions within the USA in a consistent and cost effective way. The handling of district boundaries is an example of this need and particularly for service organizations and election management applications. Similarly voters expect that they can access district boundary information simply and quickly to determine their voting locations and jurisdictions. With the advent of GPS navigation devices and online mapping applications these have raised to bar of user expectations of services. Similarly with polling place locations within district boundaries voters expect a higher level of service in selecting where and when to cast their ballots.

The presentation of results, tabulations and statistics similarly is tied into accurate boundary standards. Interactive maps of states and counties can allow voters to call up actual election results and statistics merely by clicking on a particular area. Similarly for software developers, they need to know that there is a consistent way of representing and determining any district configuration for an election. This simplifies their programming and makes their applications portable to anywhere in the USA.

All of these needs have driven the development of the new OASIS EML 150 Geo-district information structure. It provides the flexibility to define districts in the traditional way using street boundaries, or the new way using geo-coordinate systems such as GML or KML. Similarly the location of a polling place can have an address and or geo-coordinates. Equally important is that the structure of an election from geographical to logical political grouping and its reporting for tabulation and results purposes can be expressed. These linkages provide a new dimension for the EML V6.0 itself; allow new ways to quickly relate candidates, ballots and issues to political boundaries and voter registrations and their entitlement to vote.

This in turn empowers election management staff to control the whole facilitation of an election without having to rely solely on specialized software development staff to configure and setup all the actual information details.

The Opportunities

Today the individual boards of elections (BoEs) across the USA are managing their own election districting details, voter registration databases and results reporting using a variety of means including paper based records, spreadsheets, databases and application software. Each has its own formats, strengths and weaknesses and of course each has to be maintained and supported. Similarly information sharing across jurisdictions of voter registration information is challenged. For example military personnel changing election district cannot easily forward their voter registration information from one place to another.

State's themselves are not able to provide voters with consistent registration and districting information with ready access online. The election organizations are not able to survey and access such information in the support and services they provide for an election, before, during and after polling.

These challenges can be addressed by leveraging what EML 150 information provides combined with the EML 310 for voter registration information structure.

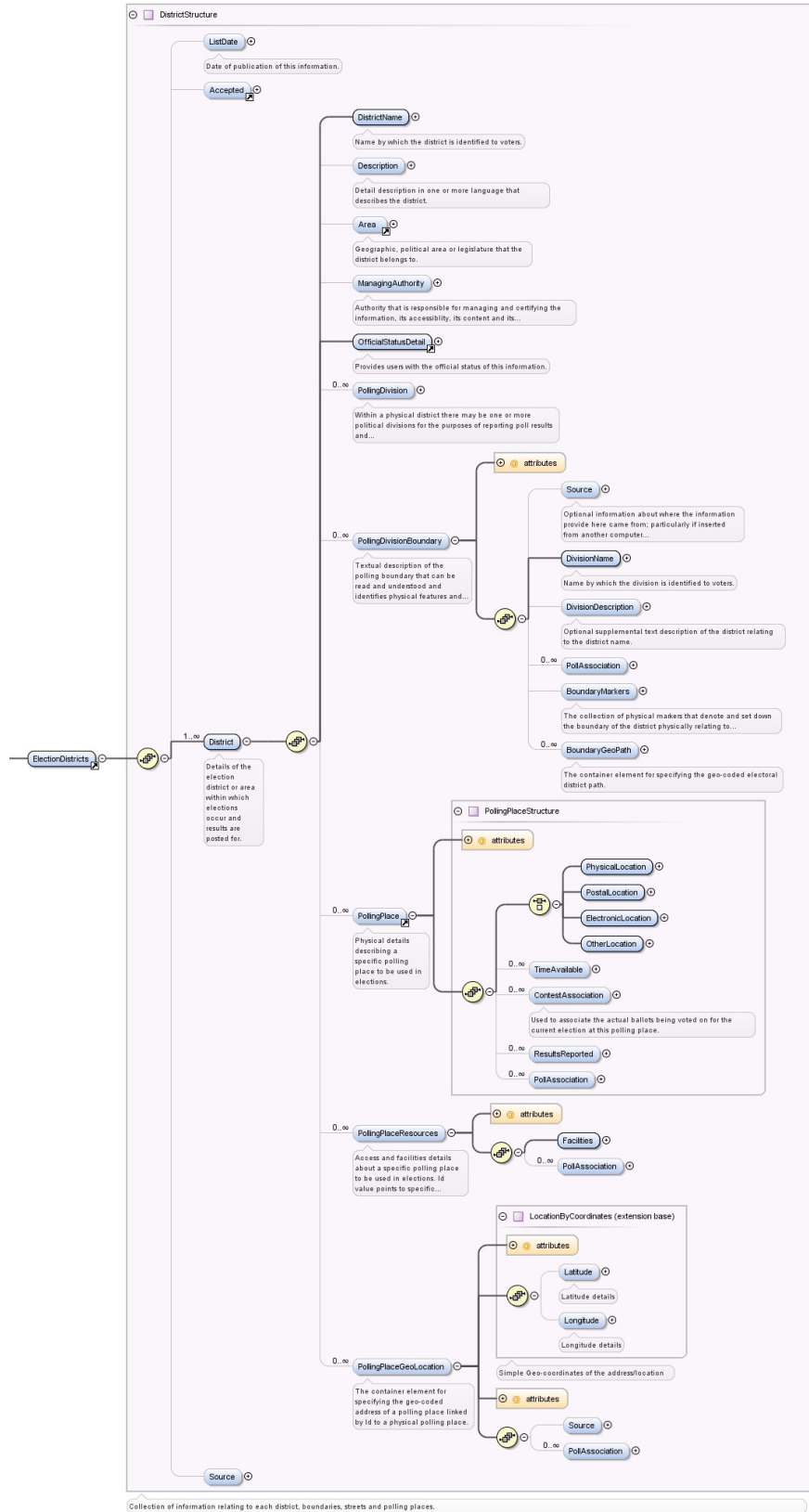
Technical Impacts

Mention has already been made of the opportunity to allow configuration and use of EML 150 information within the OASIS suite of election information that EML v6.0 provides. Also from a USA perspective this makes adoption and implementation by developers much simpler, consistent and consequently error free. By having a consistent recipe and approach that can be followed this avoids developers re-inventing the wheel. It also makes interoperability significantly better.

The figure below shows the overall information structure for EML 150 district information. In collaboration with Pew Foundation and Google developers this has been validated against their early work done on election district boundaries. Content stored in that earlier format can now be interchangeably migrated to the new EML 150 standard. Then the EML 150 provides significantly more information sharing capabilities including geo-district boundaries, not just street details, and polling place location and services. Plus the EML 150 is designed to be integrated at the core structure level with the remainder of the OASIS EML suite of structures. Therefore district information described in the EML 150 can be seamlessly referenced and shared across any of the OASIS EML information structures at the core level since the EML core structures are included into each of the EML schemas.

Also some people worry that a specific standard may restrict their particular solution. OASIS EML addresses that by allowing formal extension mechanisms in schema. More importantly in the case of EML 150 it is already designed to be flexible through the use of code values to represents types of information at the local level, including multi-lingual capabilities, so that information can be tailored to the demographics of the voters themselves.

Figure – EML 150 election district information structure



While EML 150 is targeted initially at USA district boundaries it is not restricted to just that. It is also able to handle region and city areas such as in Africa, and then the various traditional European styles of election boundaries thus making a truly international system. This is important for solution vendors since they want to market products worldwide without having to change their underlying software, just the configuration details to match the local geography and geopolitics.

Conclusions

A significant opportunity exists to leverage existing OASIS standards work on election district boundaries, polling places and voter registration to accelerate the adoption of formal election information standards in the USA. The new OASIS EML v6.0 specification and schemas already have provisions for supporting all the needed collaborations, architecture and technology mechanisms. NIST and OASIS have previously collaborated on developing XML-based standard information exchanges. Creating templates for common USA patterns and use with EML 6.0 will greatly assist developers quickly integrate proven capabilities into their software. Also NIST can develop “how to” guides and learning tools to reduce the on-ramp for developers coming new to using standards based XML for their information exchanges.

Opportunities also exist for collaborations between stakeholders to develop new standards as demonstrated by the work between the OASIS EML TC, Pew Foundation and Google in validating and refining the OASIS EML 150 information structure and mechanisms. NIST can assist by identifying future opportunities and assisting collaborations within the framework that OASIS can provide for public and open standards development for XML-based information exchanges.

Resources

OASIS Election & Voter Services Technical Committee

<http://oasis-open.org/committees/election>

OASIS Emergency Management Technical Committee

<http://oasis-open.org/committees/emergency>

OASIS Customer Information Quality Technical Committee (CIQ)

<http://oasis-open.org/committees/ciq>

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