

Executive Summary for Use Cases of the Voter Records Interchange (VRI)

November 2018

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This project is made possible by the generous support of [Democracy Fund](#) as part of its modernizing elections priority.



Overview

Project Objectives

As part of its efforts to assist in the modernization of election management practices, Democracy Fund has been championing the adoption of standardized election data. This project's objective was to extend the work performed in the definition of a common data format for voter registration records by providing a narrative and technical framework for its adoption. Its intended audience includes public sector election technologists, non-governmental technology partners of election officials and private sector vendors who supply election officials with technical solutions.

Specifically, the project defined use cases regarding specific implementations of a common data format in voter registration data that should assist these audiences in adopting a common format.

Common Data Formats

Common data formats describe the attributes of defined process in a manner that allows multiple parties to refer to the attributes in a shared language. Common data formats are akin to both vocabulary and grammar rules in language and allow disparate entities to communicate in a common language.

In their standard usage, common data formats define business processes for technology solutions that require a common data definition. This common lexicon allows heterogeneous systems to use a common translation process. For example, electronic data interchange (EDI) is a long established common data set of formats that allows entities to conduct transactions, including financial transactions, in a common format that each party agrees to accept if certain validation rules are met.

Common data formats create more efficient business transactions, improve data quality by enforcing data rules, and reduce processing time of records. Additionally, common data formats can reduce the technical complexity of systems, the cost of systems development, and may increase the availability of software solutions available to adopters of the standard.

The Voter Records Interchange

The information election officials collect about voters is common in many respects across jurisdictions that manage voter records, however, until the advent of the development of the Voter Records Interchange, there has not been any commonly accepted data format for the storage or transmission of voter information between parties. While each of the 50 + 1 states has laws, regulations, and practices that govern the information that constitutes a valid voter record and each has processes that are distinct, there are many commonalities across jurisdictional boundaries.

The National Institute of Standards and Technology (NIST), in collaboration with election officials and technologists, has created this [Voter Records Interchange](#) common data format (VRI) specifically for data exchanges of voter records.

This format defines the language and grammar that entities exchanging voter information should use to facilitate interchange of data and conducting trusted electronic transactions.

Since the enactment of the Help America Vote Act (HAVA), states have been required to maintain a centralized list of voters. The format in which those lists are managed has not been proscribed by federal statute. Since HAVA's implementation, many states and local jurisdictions have adopted laws and regulations that permit voters to conduct transactions electronically, including conducting voter registration transactions. Still, no common language has been defined that would standardize these online transactions.

Furthermore, external organizations have implemented electronic voter registration tools to assist voters in conducting voter registration transactions but no common mechanism has been defined for transmitting this information captured to election officials.

The National Voter Registration Act (NVRA) requires certain public sector agencies (notably departments of motor vehicles) to permit citizens to conduct voter registration transactions concurrent with conducting other transactions at these agencies. While many of these NVRA agencies have implemented wide ranging electronic processes to facilitate their primary transactions, including renewing drivers licenses, no common format for conveying information collected for voter registration purposes to election agencies has been adopted. While some states have integrated the interchange of electronic data between NVRA agencies and election administrators, the process has been implemented de novo in each state.

Moreover, states and local jurisdictions have swiftly been adopting the use of electronic pollbook technology. Electronic pollbooks are digital rosters of voters that are distributed to locations where voting is conducted. These systems are used by election workers to verify a voter's eligibility to cast a ballot and record a voters participation in an election. These systems generally rely on the HAVA voter registration database to generate lists of voters. However, each state and locality implementing this technology has had to partner with a myriad of systems vendors and integrators to standardize and load voter records into these systems. Following an election, many jurisdictions then use information from these systems to update voter records. With no standard translation language between HAVA voter databases and locally deployed electronic pollbooks, the process for generating these electronic lists introduces complexity and risk.

The adoption of the VRI by election officials will simplify the implementation of each of these electronic voter record transactions. Additionally, it can provide predictability in the development of technology by entities providing software solutions to election officials.

Using this Document

The use cases and source code examples assembled in this project are designed to allow election officials and technology providers to more simply use the VRI to implement common solutions that assist voters in conducting registration and other transactions. Specifically, the use cases define the scope of technical relationships between election officials and third-party technology vendors, between election officials and other state offices that provide voter registration services, and, lastly between local and state election offices in the preparation of electronic pollbooks.

This set of use cases, workflows, and sample code are designed to provide a road map for VRI adoption and will not, in and of themselves, lead to that adoption but this road map is a necessary precondition to the adoption of the standard more broadly.

Actors

Local and state election officials in states that permit the use of electronic records to allow individuals to register to vote, update voter registration information, and conduct other transactions affecting voter records electronically.

Third-party registration providers who have developed online tools to assist voters in registering to vote, conducting other online voter transactions, or in confirming a voter's eligibility. These third-parties develop online software tools that collect information and can transmit this information to local and state election officials. Additionally, these third-parties can collect information from the local and state election officials and share it with the voters who use the online systems.

Other state entities (commonly departments of motor vehicles) that are required to provide voter registration services (normally as defined in the National Voter Registration Act). In states that have electronically integrated voter registration transactions between NVRA agencies and elections offices, these state actors commonly compile electronic voter registration records and transmit them to the elections offices for final disposition.

Local and state election officials using electronic pollbook technology who require a subset of voter registration lists that are managed in remote systems during a voting period. These electronic pollbook systems collect information from the centralized voter registration database and, ultimately, return information about voter participation back to the system after the voting period is over.

Using The Use Cases

Use Case 1

Use case 1 defines the steps that both a third party provider of online voter registration services and the election office receiving these records would need to follow to smoothly integrate systems. Electronic registrations collected by third-party entities are not new. For over a decade organizations have been collecting registration information online from prospective registrants and assisting the users of their systems in the process of completing the registration process. However, this process often requires the

end user to print a completed application and mail it to the appropriate local authority who is responsible for the ultimate determination of the eligibility of the voter.

The use of the VRI can create a common set of data rules that third party registration providers and states can agree upon to lead to broader, more consistent implementation of distributed voter registration systems.

Understanding that states will have various degrees of automation in electronic voter record management, the use cases describe an array of methods that may be adopted by states and third party providers. Underlying each of the use cases is the assumption that a state will deploy an electronic application programming interface (API) that will accept transactions which can be translated into the VRI format and then provide a response to the third party provide in the same language.

The use of VRI still would require legal and regulatory compliance and state specific configuration for the conducting of all electronic transactions, but systems developers will be able to leverage this common language to more rapidly and accurately implement solutions to benefit voters.

Transactions types described in this use case:

- Online voter registration from third-party registrants
 - Without data validation prior to submission
 - With prior data validation prior to submission
- Voter record lookup
 - Locate current registration status of voter
 - Locate voting location(s), local official contact information

Use Case 2

Use case 2 describes the complex interchange of information between state actors in conducting voter registration transactions regulated by NVRA. As mentioned above, some states have adopted an electronic interchange of voter registration information between state motor vehicle entities and state elections offices. These implementations have required hours of customized software development and data translation processes to facilitate the exchange of this information. While these offices have been exchanging information, normally in printed format, for over 20 years, state motor vehicle agencies and state election offices have grown up in distant technology and regulatory families. The adoption of a common language to which each agency would need to translate data and business processes will substantially reduce the complexity of future systems integrations.

This use case extends the first use case to include the exchange of information contained in systems managed by NVRA agencies and includes sub-use cases that describe a variety of transactions that voters commonly perform through NVRA agencies.

Additionally, online voter registration transactions in many states rely on drivers license information as a step in digitally signing transactions. Each state adopting this mechanism for establishing the authenticity of voter information has had to define information standards. The VRI will provide the

framework for future implementations of information exchange for voter authentication purposes. In the use cases below, the data elements that are available in the VRI that would allow for this authentication are described.

Transactions types described in this use case:

- Electronic NVRA voter registration transactions
 - New registrations
 - Update to existing voter registration records
 - Pre-population of update record transactions with information from the election office
- Voter authentication transactions
 - Submission of identifying information to the NVRA agency to aid in authentication and authorization

Use Case 3

Use case 3 describes the processes involved in exchanging information between centralized voter registration systems and systems that are used at polling locations to verify voters' eligibility and to track voter participation in an election. As described above, the steps followed to generate electronic lists of voters that are loaded into electronic pollbook systems vary by state and technology. The use case below describes a common set of rules governed by the VRI that will allow for a simplified process for extracting voter data and managing voter transactions.

The current process used by many local election officials requires the installation and configuration of additional software that provides a translation service between the native data formats of the central voter registration system and the specific electronic pollbook system used. The current process also requires the configuration of other data sets, metadata, that describe the election and rules governing voter participation. Each of these data elements and rule sets can be described in the VRI and the use case below describes, at a high level, the roadmap that election officials and systems vendors can use to determine the applicability of the VRI in their specific implementations.

NOTE: As a result of this project, as of September 25, 2018, the VRI has been extended to allow for a more comprehensive data record set describing a voter's participation in an election including the storing information about the facility at which the voter participated.

Transactions types described in this use case:

- Generation of voter lists for distribution to electronic pollbooks
 - Creating a common data format from tabular data
- Creating voter participation data records for re-importation into the source voter registration database.

The Code Examples and Dictionary

This engagement also contains a repository of computer source code that can be used by systems developers to implement the VRI in several commonly used technologies. The repository contains out-of-the-box class libraries that define all data elements described in the VRI in C# and Python, two

of the most commonly used web programming environments. A class library is a set of software routines and definitions that programmers use for more easily writing object-oriented programs. .

These class libraries and some reference examples can be used by election technologists to generate and validate information exchanged in the VRI format. Also included in the repository is a reference implementation of a data schema for use in Microsoft SQL server, one of the most used database platforms in voter registration systems. This SQL data schema can be used to validate data received in the VRI format and may be used by database programmers to generate records in the VRI schema.

Lastly, also included in this engagement is a data dictionary of the data objects used in the VRI in a human readable format that provides a needed guide for developers to better understand the standard and its implementation.

Conclusion

This project began on the premise that the VRI common data format could be used to perform commonly conducted electronic voter record transactions and that those transactions could be generalized into use cases. The project documentation seeks to do just that by describing three common use cases and expanding on each in a manner that could be followed in most election jurisdictions. While there are additional use cases for the VRI, the core of the use cases described in the project may be extended and have broader applicability.

While the VRI is a comprehensive common data format that offers great promise in simplifying implementation of electronic voter records transactions, most election officials have limited technical staff to adopt and implement new technologies and methods. This projects aim was to provide a leg up to these election officials and their technology partners my providing a common road map to follow.