

INNOVATION AND SECURITY: CORNERSTONES OF MODERNIZED VOTER REGISTRATION

Voter registration systems are the heart of the election, the foundation on which states and counties engage their citizens in the democratic process. The data housed in these systems affects all other components of the election. It is paramount to have secure, accurate, and efficient systems capable of producing secure and accurate data.

This paper discusses key technology advancements in voter registration systems and how the implementation of new technologies can automate processes, improve data accuracy, security, and ensure election integrity.

BUILD OR BUY?

Once a state makes the choice to modernize, it can be tempting to task their IT department with building a custom software solution that matches requirements and does not have ongoing licensing and maintenance costs. The reality is that custom software development projects rarely live up to expectations. Projects frequently end in cost overruns, schedule delays, and unsatisfied users.

Delivering complex, production-grade software to manage mission-critical processes is often much more challenging than it initially appears. Successful execution requires significant orchestration. Even the most basic software project requires a knowledgeable team, hundreds of decisions both big and small, and countless hours spent developing requirements, designing, building, testing, deploying, training, operating, and maintaining multiple branches and layers of software code. While there are undoubtedly times when building custom, highly-specialized software is to an organization's benefit, it is a decision that must not be taken lightly.

SECURITY MUST BE THE TOP PRIORITY

Risk mitigation and prevention practices for connected systems used in many current systems are not where they could be—basic perimeter, network, server, and database protocols are no longer enough. As the gateway to the entire voting process, voter registration systems are a key target for malicious activities. Whether this activity intends to influence election outcomes or profit from the theft of voter data, one fact is certain—the cyber threat landscape is constantly evolving.

To protect data integrity and preserve voter confidence, those responsible for election data today must consider the environment in which it resides and deploy the following strategic layers of security:

- *Distributed Denial-of-Service (DDoS) Defense*
Availability is critical, both in administering elections and maintaining public trust in the system. Layers of protection should start well outside the data center, with the goal of stopping most attacks well before they get close to the application.
- *Access Control & Data Protection*
Robust, best-in-class data protection technologies and standards must be leveraged to protect sensitive voter information. Data must be encrypted both in transit and at rest, ideally using multiple encryption layers, and role-based access control should restrict access to information on a “need-to-know” basis. Access to the system should be based on industry-standard authentication technologies, ideally leveraging multi-factor authentication and single sign-on.
- *Intelligent Intrusion Detection*
Design and deploy robust intrusion prevention and detection systems. While off-the-shelf tools are necessary, they aren’t sufficient to address modern threats. Domain-specific tools can analyze trends in voter registration data, alerting administrators to suspicious behavior that may indicate a compromise. Immutable logging techniques should be used to guarantee auditability of the entire system.

IMPROVING THE VOTER AND ELECTION ADMINISTRATOR EXPERIENCE

A workflow-centric user interface for election administrators and the voting public is essential. Regardless of the user, the interface should have a single point of control and be optimized to quickly locate most common operations performed.

THE VOTER EXPERIENCE

As our society has evolved and become reliant on the use of connected devices, voters expect to be able to independently complete tasks online. This can include voter registration processes. Verifying personal information, locating polling places, requesting an absentee ballot, and the ability to track the progress of a completed ballot is essential to voter convenience and confidence in the system.

THE ADMINISTRATIVE EXPERIENCE

As the tasks that must be accomplished by administrators have evolved, voter registration systems have become more reliant on connectivity and accurate real-time data. Administrative staff must be able to accomplish more tasks in less time, and with a higher degree of data integrity. A workflow-centric interface with a single point of control can make the difference.

More tasks completed. Less work. Better data.

The following list highlights design principles and technologies that can instill confidence, reduce training, and increase productivity:

- Soundex phonetic full-text search and predictive (type ahead) search capability
- Type ahead address matches with USPS formatting, including fuzzy data matches for partial information, that can be quickly selected from a drop-down box of potential matches
- Drop-down suggestion options for autocompletion as common system information or previously entered information is typed
- GIS integration and the ability to interact with maps and district boundaries
- GIS features leveraged to facilitate redistricting and polling location planning
- Robust reporting features, including mandated reports and custom ad hoc reporting capabilities
- Extensive automation and configuration management tools that simplify complicated processes and automate repetitive tasks
- Real-time integration with external interfaces, including government data and public “big data”
- The ability to compare, accept, or reject incoming information from external sources

INTEROPERABILITY AND REAL-TIME DATA INTEGRATION

Two-way integration with electronic poll books and external interfaces, such as the state’s motor vehicle agency, is a fundamental requirement of voter registration systems today. Current election software design methodologies intended to coexist with other election systems and devices is historically rife with potential disruption of services. To prevent these disruptions, design methodologies must streamline the ability to interact with other devices and systems and standardize the data being consumed.

Clean data improves the interoperability between devices and systems. If the data flowing from the voter registration system to the poll book is accurate, the result will be a quicker check-in process, shorter poll station lines, and an improved voter experience. Updates are then relayed back to the voter registration system in real time. The end result is simplification, increased efficiency, and increased accuracy in voter communication, confidence, and management.

LEVERAGING NEW TECHNOLOGIES REQUIRES A MODERN PLATFORM

Optimal system architecture includes extensive automation and configuration management tools that give administrators the capacity to automate and control configuration changes and the deployment of software. Implementing this architecture will require a modern platform. Voter registration systems designed using distributed architecture can seamlessly interact with other

systems and provide the ability to add, update, or remove components without impacting the availability or reliability of any one component.

DESIGN USING DISTRIBUTED ARCHITECTURE

Voter registration systems using new technologies are built using a flexible distributed architecture design. This environment allows states to adapt components and strategies to fit the needs and capacities specific to their state. Distributed architecture design provides the ability to automate repetitive tasks that are required of election officials, including interoperability with outside data management resources and the ability to receive seamless software updates. Data is cleaner going in and stays cleaner over time. External systems interoperate with the election management system for optimal security, flexibility, and usability.

PROVIDE REAL-TIME ACCESS TO EXTERNAL DATA

Ensure real-time data accuracy by enabling connectivity to multiple integration points from external databases. Changes to voter data and eligibility status can quickly be processed and reflected in the system data. Suggested external integration points include: the Social Security Administration (SSA), the state's motor vehicle agency, the National Change of Address (NCOA) database, Electronic Registration Information Center (ERIC), Systematic Alien Verification for Entitlements Program (SAVE), Administrative Offices of the Courts (AOC), Departments of Health and Human Services (DHHS), Child Protective Services (CPS), Departments of Corrections (DOC), and State Parole Boards (SPB).

INTERACT WITH HIGH INTEGRITY GIS DATA

With complete GIS integration, administrative staff can interact with GIS data to simplify the redistricting process. Enabling this feature provides the ability to select and manipulate district boundaries by interacting with shapefiles.

Using high integrity GIS data and interoperable systems, administrators will be able to use real data to maximize efficiency on Election Day. Planning for polling places and Vote Center locations can be simplified to consider proximity to high traffic areas, traffic volume, and traffic peaks. GIS data can also be used for Election Day planning by analyzing data to optimize staff schedules and ensure a sufficient stocking of ballots and equipment.

INTRODUCE MACHINE LEARNING

Machine learning software technology is designed to adapt to your system without human intervention. Deploying a state-of-the-art voter registration system will be essential in leveraging the potential advantages of this technology. As a system matures, it becomes more adept in identifying patterns and flagging potential problems.

Business logic rules are created to quickly identify and triage suspicious data. As an example, abnormal spikes in new voter registrations, deaths, or demographic changes can indicate

potential manipulation. Immutable system logs can then be reviewed to further refine business logic rules as it “learns the system” to determine normal versus abnormal activity.

VOTER REGISTRATION COMING OF AGE

Advancements in technology occur rapidly and often. To ensure effective and truly modernized voter registration systems stay up to date, design must be modular, scalable, and configurable systems—with the ability to keep pace with both legislative changes and advancements in technology.

Secure elections and data integrity should always be the end goal. In securing and updating the architecture of systems, underlying processes, and integration points, we can reap the benefits that other industries have already realized and be prepared to embrace emerging improvements in artificial intelligence, voter analytics, and other technologies as they become available. We can keep the pace, with integrity and with confidence.