

# Election Administration Needs Data Integrators

A White Paper from Enhanced Voting and The Turnout

## Executive Summary

Election administrators face a deluge of data, burdening staff and IT systems. Election offices should consider employing *data integration*, a discipline successfully used in other industries to consolidate, transform, analyze, and report on data. Data integration is both a service and a technology, working together to make it easier to share, analyze, and make good decisions based on the data election officials already have. Investment in data integration systems and services can reduce mistakes, increase efficiency, and produce new insights.

## Data Data Everywhere!

The number of systems election officials use has steadily increased over time, particularly since HAVA. The MOVE Act added requirements for electronic delivery and easy access to ballot status information. The growth of vote centers and early voting introduced electronic pollbooks and ballot on demand systems. At the state level, election improvement efforts have led to innovations such as online voter registration and online access to voting information. Each of these digital systems consumes and produces data—usually a lot of it.

## The Problem

Too many systems that produce and consume data don't work together, undermining opportunities to understand and improve election administration.

While more data can present opportunities for analysis, understanding, and improvement, it must first be centrally collected and organized. Instead, we have a proliferation of systems with limited interoperability, incompatible data formats, and no central system that effectively manages data flows. To set up each election or get answers to questions, staff consult multiple systems and often manually translate or even re-enter data.

## **Common Data Formats: A Step Forward, but not a Turnkey Solution**

Common data formats (CDFs) developed by the National Institute of Standards and Technology (NIST) solve part of the problem by providing standards for data exchange in several key areas of elections. Systems that leverage CDFs, including those certified against the Voluntary Voting System Guidelines 2.0, will be better equipped for the task, but won't be fielded until at least 2025. Considering the development and refresh cycles for the systems used to support elections, it could be decades before CDFs are successfully promulgated through an entire election office.

Moreover, CDFs require configuration and take great effort to get right. Only recently has the healthcare industry started seeing success following more than 35 years of standardization efforts like Health Level Seven and United States Core Data for Interoperability.

## **The Solution: A Dedicated Integration Capability**

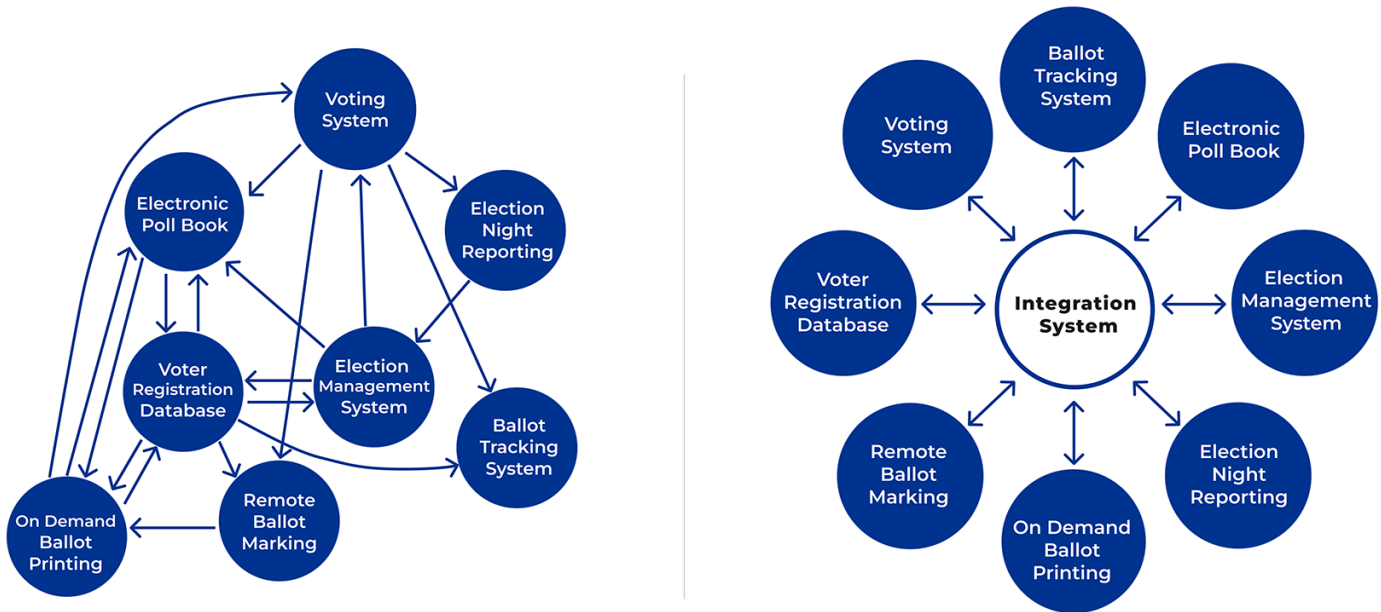
There are two primary ways to conduct data integration. One is to teach each system the same language, and then expect those systems to talk to each other. This can work, but it takes time and has mixed results, as it relies on shoehorning data integration and analysis capabilities into systems designed for other purposes. Voting systems and election management systems often default to this, but they are typically air-gapped and otherwise ill-suited to the task.

Alternatively, a data integration system's primary purpose is to translate between common and proprietary formats. Data integration systems are used in financial services, human resources, logistics, and healthcare industries. Instead of teaching every system to speak the same language, you build one system specializing in learning the languages of every other system. Integration systems communicate via *connectors* built in or provided by the vendor themselves. Data integration systems are often supplemented by data integration services to jumpstart getting systems connected, then providing maintenance to keep things running smoothly.

**Integration System:**  
A dedicated system that can speak to all other systems and provide election officials analysis, visualization, and reporting.

## What Needs integration?

All major systems in an election environment produce data worthy of integration: ballot marking and tabulation, pollbooks, voter registration, remote ballot marking, on-demand ballot printing, ballot tracking, election night reporting, and more. The data include the definitions of candidates, measures, contests, political parties, ballot styles, cast vote records, voter information, polls and pollworker information, geopolitical definitions, event logs, and others.



*Before and After: Data flows between election technology components without (left) and with (right) an integration system*

## Integrate Once, Access On-Demand

Data integration systems also reduce repetitive tasks. With manual integrations, errors are common and difficult to find. Manual processes must be conducted repeatedly, while with an integration system, you “set it and forget it.” Translations are automated, the risk of errors is minimized, and results are immediate and consistent. Additional configuration is only needed with significant changes to the systems, if even then. Instead, election officials can dedicate their limited resources to other critical tasks. An integration service can finish integrating systems that use CDFs and establish translations with systems that use proprietary data formats.

### **Integrate it!**

Your ballot-on-demand system must be set up to match ballot PDFs with precincts and parties each election. With an integration system, you can define the patterns and automate the mapping for each election.

## Quality Integration Platforms: Completeness, Connectivity, and Consistency

A good data integration system will make election set up, conducting analysis, and creating reports easier, faster, and more accurate.

Features election offices should look for include:

### **Completeness:**

- Connectors for all major election technology products
  - Does the integration system provide built-in support for products currently on the market, and potentially not on the market but commonly fielded?
- Extensible Data Model
  - Can the data model be extended to store state- and vendor-specific data?
- Repository
  - Does the integration system provide a repository to store and extract data for key use cases such as pre-election results reporting, and cast vote records?

### **Connectivity:**

- Open connectivity model
  - Can other vendors or integrators can add or submit their own connectors?
- Common Data Model
  - Is the data model based on the NIST Common Data Formats?
  - Does the integration system support upgrading or downgrading between multiple CDF versions?

### **Consistency:**

- Data accuracy validation
  - Does the integration system allow you to validate the accuracy and completeness of data before it is ingested, and prior to export?

## Quality Integration Services: Election Experience and Technical Ability

Integration services leverage the experience of election technology experts who have dealt with many complex integration engagements. Coupled with a data integration system, they provide high-quality and effective solutions by performing complex analysis and configuration tasks.

Skillsets for system integrators include:

- Experience dealing with many integration projects. Ask for past projects and references.
- Experience working with structured data like XML and JSON.

**Integrate it!**  
Have mismatched precinct IDs between the voter registration and tabulation systems led to some voters getting the wrong ballot? Integration systems can persistently map data from one system to another, alerting on likely errors.

- Experience performing extract, transform, and load (ETL) operations.
- Experience with SQL and database technologies like Oracle, SQL Server, or Postgres.

Integrators' value stems from deep knowledge and many engagements, often making outsourced integration services more cost effective; once an integration system is established, specialized labor to manage it is typically less than full-time. Additionally, connectors are, by definition, interoperable, so a third-party creating them can spread the cost across multiple data integration systems in different jurisdictions.

## Conclusion

Massive increases in data present integration problems for election officials. These increases also present opportunities, but only if election officials are equipped to take advantage of them. Data integration systems and associated services allow you to integrate systems once, leading to the ability to do more, reduce errors, and increase efficiency.

Data integration won't run your election for you, but where could you put additional resources if you could cut out the repetitive, error-prone tasks of manual data translation and integration? What would be the consequences of faster, more informed decision making that comes with access to fully integrated data on demand?

In time, data integration systems and integrators will become indispensable tools in election administration by breaking down system silos, centralizing key election data, and enabling better business intelligence and performance.

## About the Authors

### **The Turnout (@TurnoutRocks, info@turnout.rocks)**

The Turnout is a consultancy focused on providing reliable business intelligence in the form of process modeling workshops, legal framework analysis, data standardization, data analysis, and process improvement. The Turnout works with clients to understand their industry, their specific needs, and develop solutions that work for them.

### **Enhanced Voting (@EnhancedVoting, team@enhancedvoting.com)**

Enhanced Voting builds products that elevate election technology to the level voters and election officials expect and deserve, with professional service and expertise you can count on. Since 2013, Enhanced Voting has worked with election officials across the country to supply voting solutions that are secure, easy-to-use, and accessible to all. Enhanced Voting's solutions include electronic ballot delivery, election results and results aggregation, and absentee ballot tracking.