Interoperability WG Update

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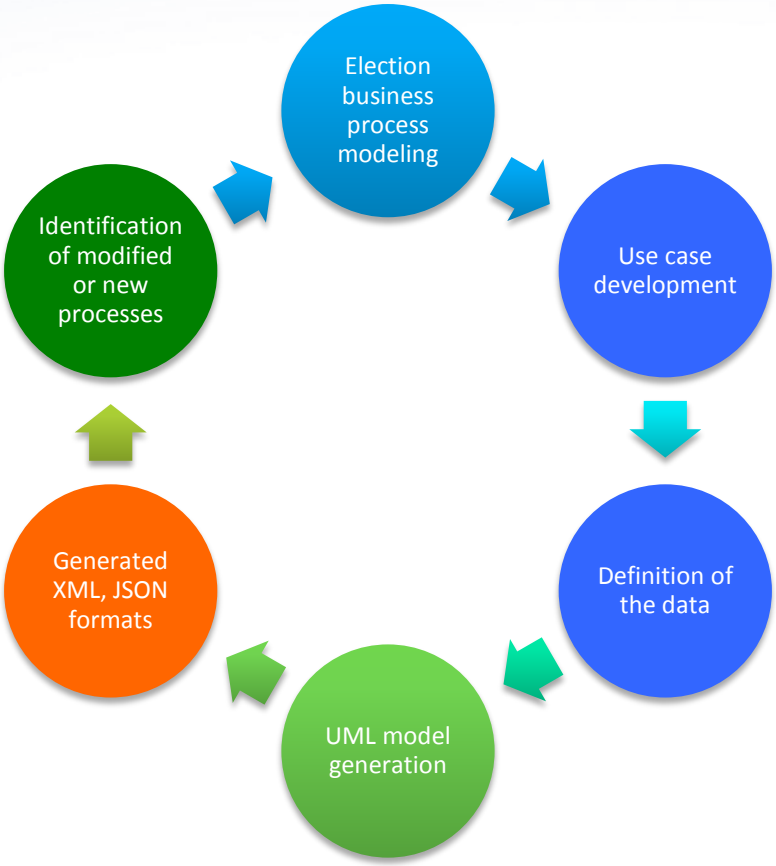
TGDC Meeting

September 15, 2016

PWG Interoperability Efforts

- Common Data Format (CDF) efforts
- Election Modeling
- Election Methods/Models

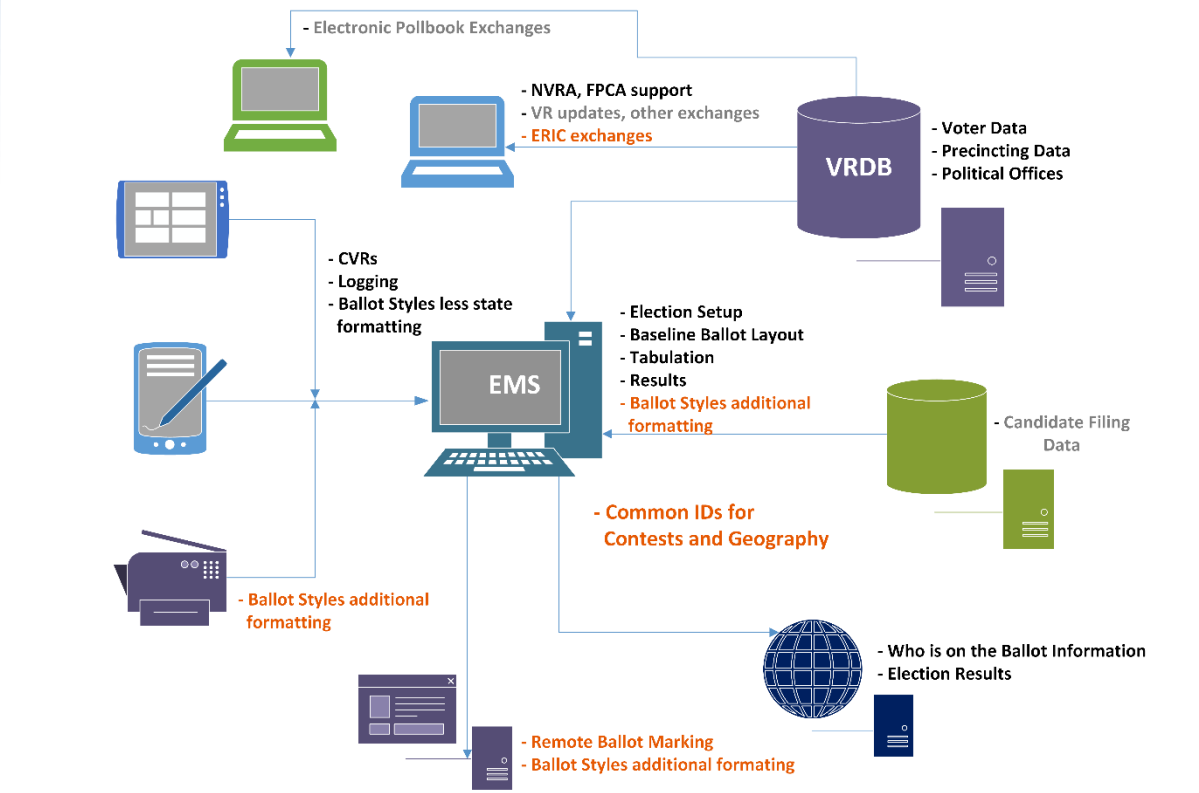
Process for CDF Development



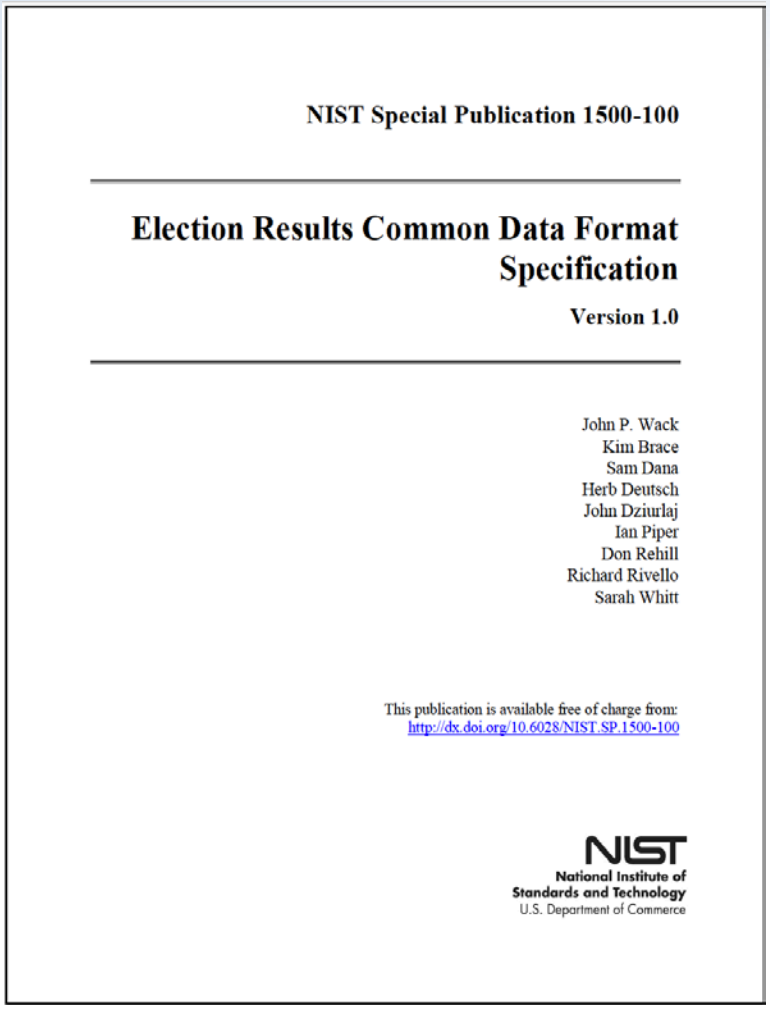
Feedback from the PWG

- Strong EO desire for interoperability in polling place devices.
  - More manufacturer-independent components.
  - At same time, still a need for unified-manufacturer voting system.
- Manufacturers should use CDFs in their product lines, especially to external interfaces.
- Real interoperability is difficult to achieve, chip away at interoperability by working inward into the voting system.

Progress Thus Far



Election Results CDF Specification



NIST Special Publication 1500-100

Election Results Common Data Format Specification

Version 1.0

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This publication is available free of charge from:
http://dx.doi.org/10.6028/NIST.SP.1500-100

NIST National Institute of Standards and Technology U.S. Department of Commerce

- For pre- and post-election data, reporting aggregated and detailed election results.
- Earlier version already in use in OH, now in NC, also in Pew/Google's VIP 5.0.
- Produces an interoperable EMS import/export format.

Election Event Logging CDF Specification

Draft NIST Special Publication 1500-101

Election Event Logging Common Data Format Specification

Version 1.0

This publication is available free of charge from:
http://dx.doi.org/10.6028/NIST.SP.1500-101

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- A simple format to hold election events, i.e., opening of polls, casting a ballot, etc.
- Manufacturers will log as they do currently but include capability to export or translate into this format.
- Some log items will be useful to EAC EAVS, e.g., electronic pollbook logs items.
- Current draft specification has approval from working group, ready for publication as a NIST SP.

Voter Registration CDF

- Deals with data elements from or implied from NVRA, FPCA, and state-specific variations.
- Involves request/response messages to register or modify or inquire about a voter.
- Will include DMV transactions.
- ERIC board is considering a member requirement to support the CDF.
- OH interested in implementing initial specification.
- Aiming to complete by spring, 2016.

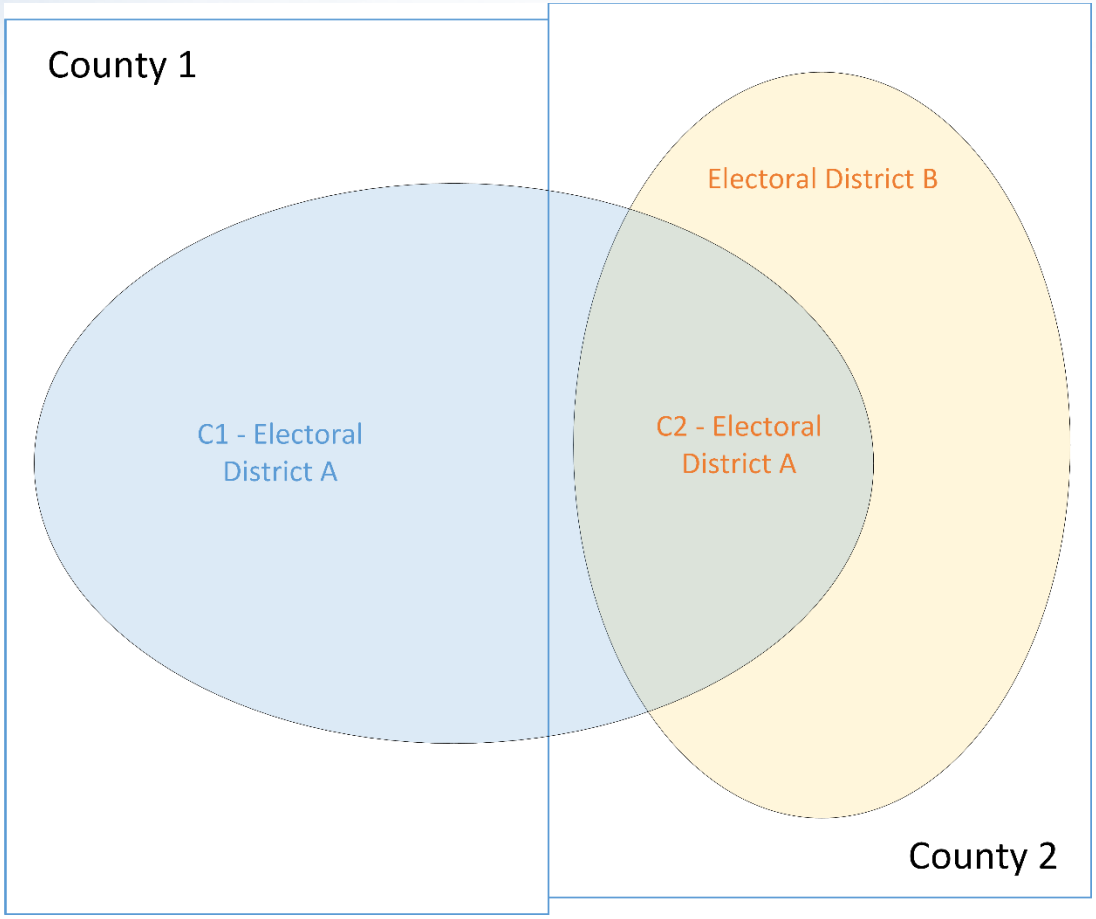
Electronic Pollbooks CDF

- Deals with data involved in checking in voters at polls, activating the ballot, same-day registration.
- Builds off voter registration CDF and adds additional items for linking voters to polling places.
- Will be finalized after voter registration CDF is complete.
- May be easiest spot to achieve full device interoperability.

Auditing - Cast Vote Records CDF

- Deals with voted ballot information exported from voting devices and scanners.
- Would increase interoperability and make it easier for election officials to gather and combine these records during election day(s).
- Would serve as input to auditing devices.
- Aiming to complete specification by winter, 2016.

Common IDs



- IDs are now ambiguous across the state.
- More difficult to analyze results.

Common Identifiers

- Would likely work with the Open Civic Data-Identifier scheme (OCD-ID).
  - e.g.: *us:state:county:town…..*
- For items such as districts, precincts, and other geographies, as well as contests and offices.
- Foundational work by Sunlight Foundation.
- May require a management effort to assist in creation and for serving as an authoritative reference.

Timeline for Completion

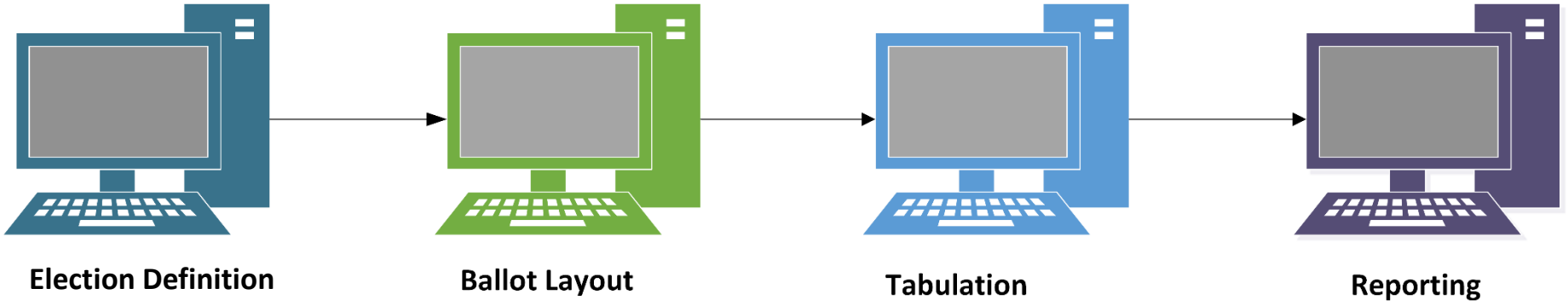
- What could be accomplished by next VVSG:
  - Completed VR system.
  - CVRs.
  - Electronic Pollbooks.
  - Candidate Filing.
  - Ballot Styles with additional formatting.
- Maybe - Common Identifiers for Political Geography and Contests.

CDF and Component Certification

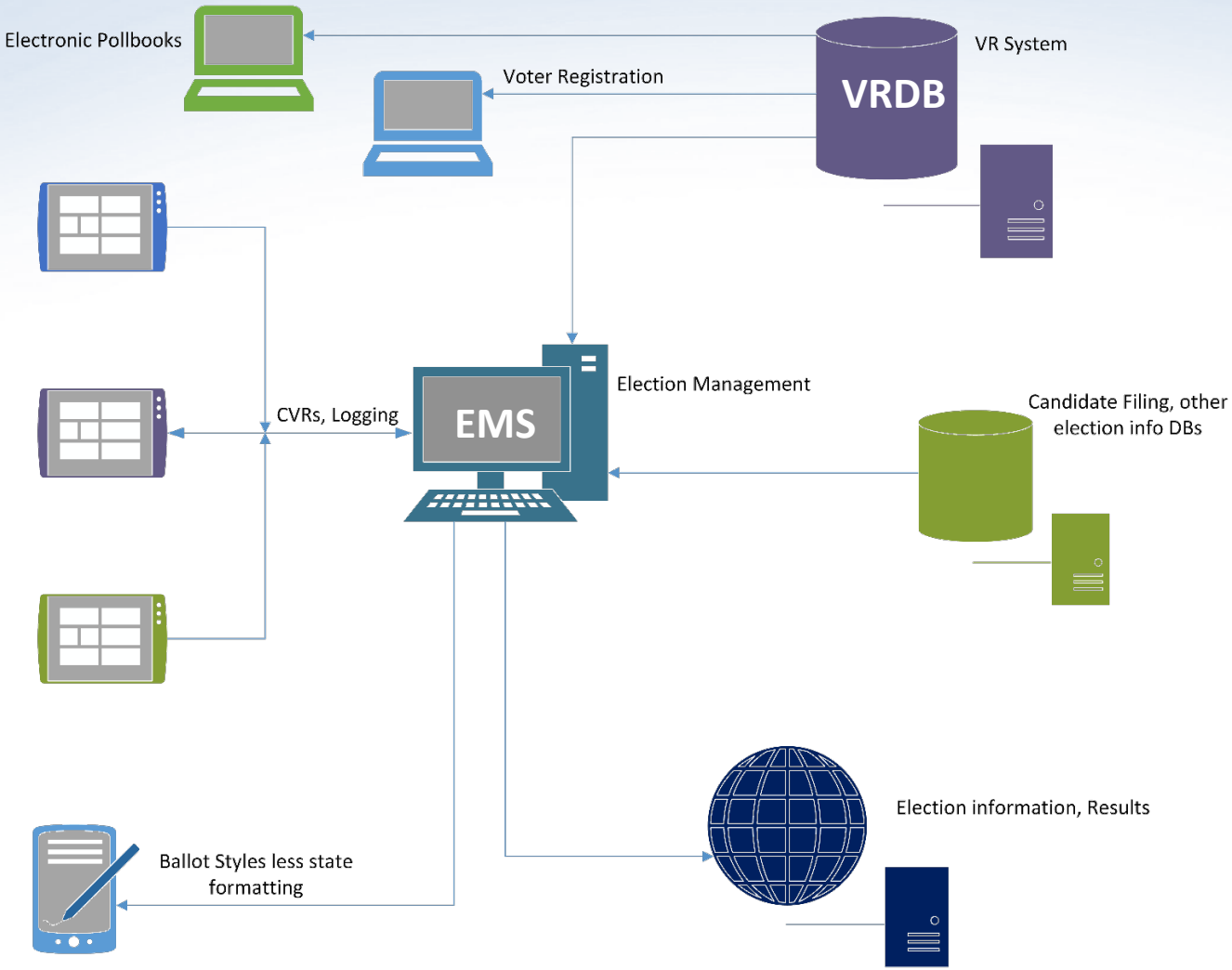
- Component certification requires interoperability.
- CDF not sufficient for hardware-related interfaces or exchanges of highly-formatted data.
  - Ballot activation involving memory cards.
  - Ballot styles with state-specific formatting.
- Component certification possible for devices that primarily exchange unformatted data.
- Component certification may still require some re-engineering.
- Ultimately, election officials will ask for this or not.

Enabling Component Certification

OR



Where Possible Now/Soon



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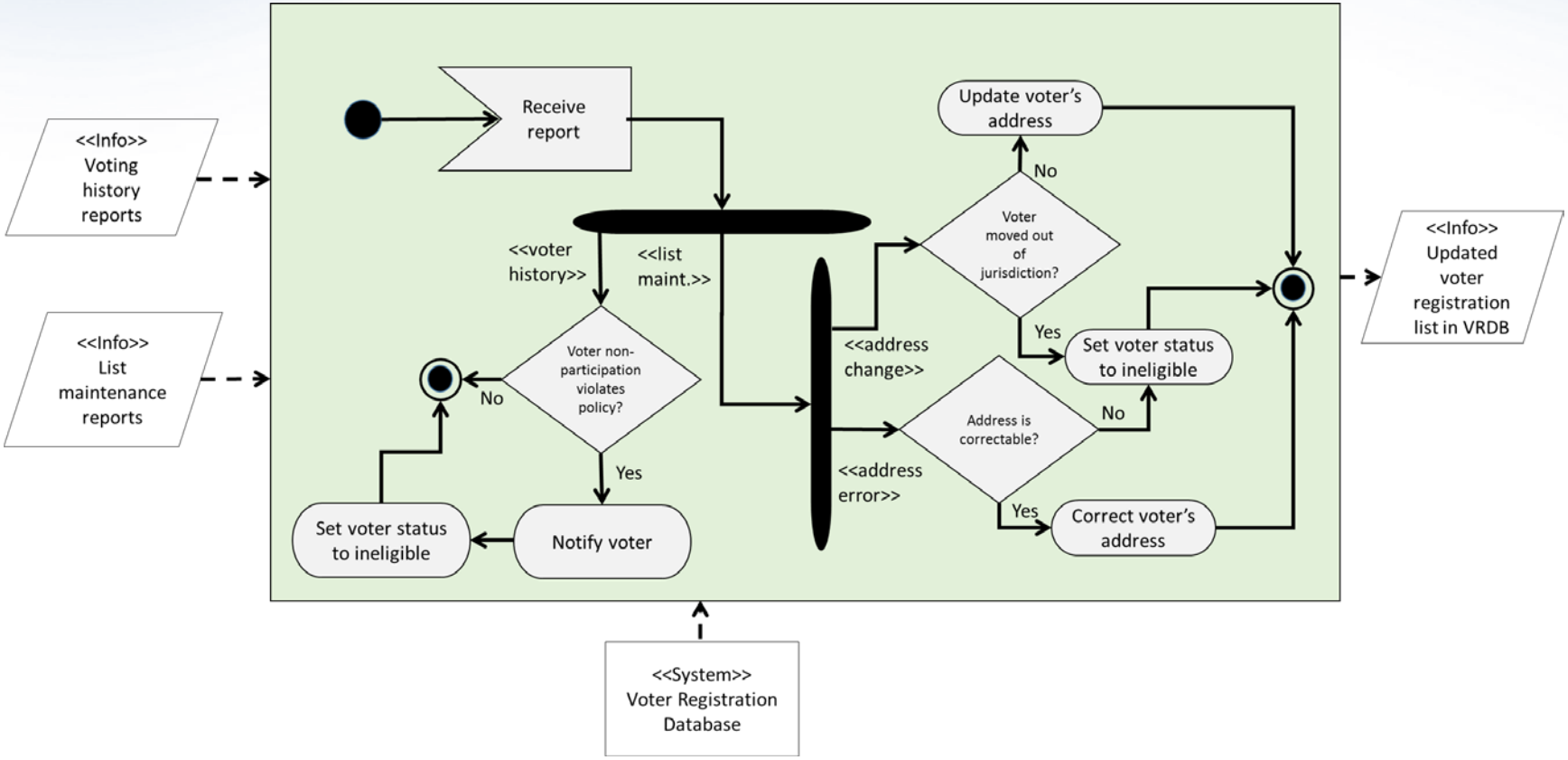
Election Business Process Models

- A visual description of election business processes showing how they are nested and inter-related.
- Major author Kenneth Bennett of LA County, with Election Modeling sub-group.
- Used as basis for CDF use cases.
- Could serve as major groupings of VVSG requirements.
- Can assist in identifying interoperability between major processes.
- Two examples follow:

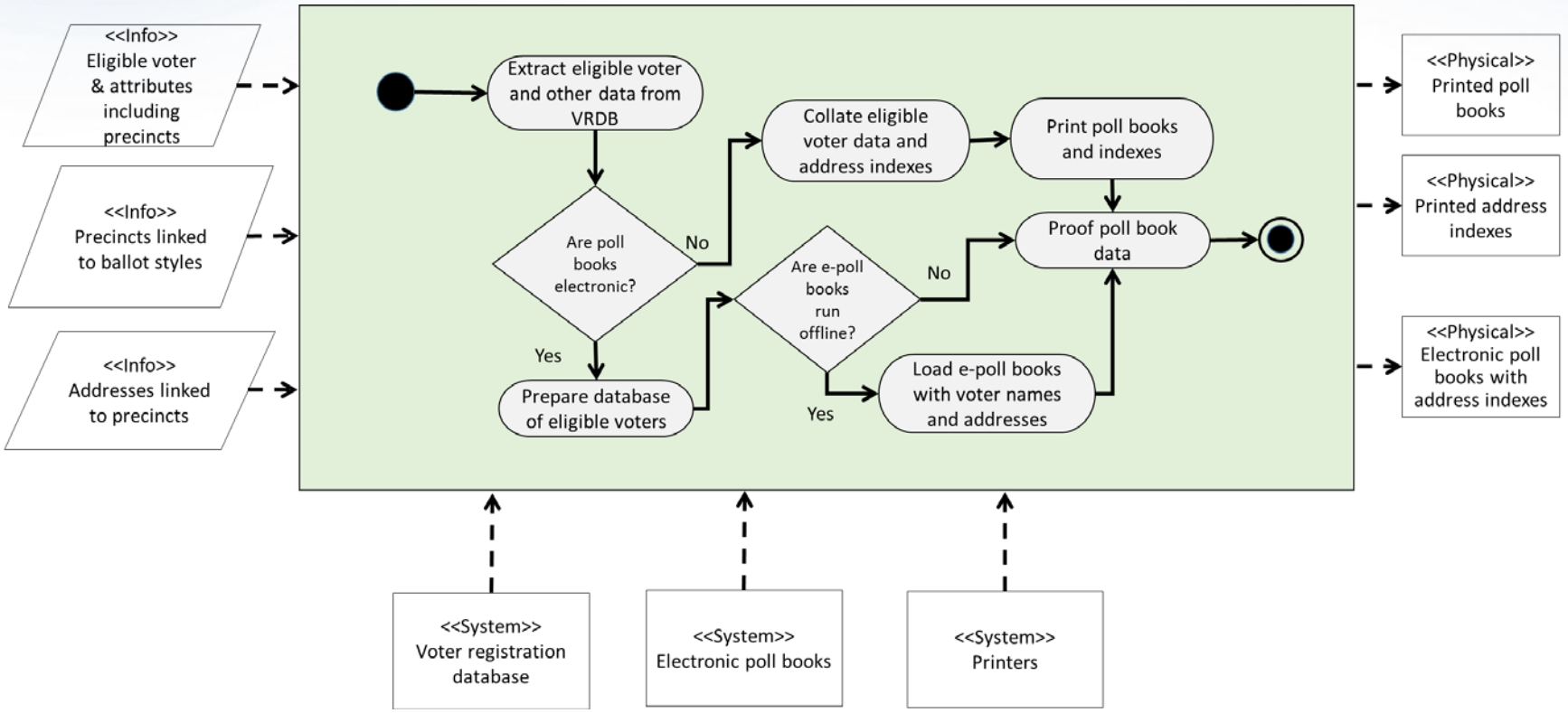
Process: Process Voting History and List Maintenance Reports

Parent: Election Preparation/Manage Voters/Maintain Voter Roll
Editor: Kenneth Bennett
Date: 03/16/2016



Process: Prepare Poll Books

Parent: Election Preparation/Prepare Voting Materials and Equipment
Editor: Kenneth Bennett
Date: 03/16/2016



Further Component Breakdown

- Contest, Candidate, jurisdictional association
  - Candidate Filing data
  - GIS data
- Ballot layout
- Ballot generation
- Blank ballot print
- Device programming
- Vote capture/marking
- Ballot duplication
- Intent, resolution, adjudication
- Paper-CVR/marked ballot print
- Ballot tally
- Reporting system
- Audit system
  - Rendering of individual cast vote records to show:
    - Content of the ballot image for recount/ballot audit (e.g. PDF, tif, etc.) and
    - In a format for reporting (e.g. xml, csv, xlsx, etc.)
  - Export of event logs.
- Voter lookup
- Ballot assignment/activation
- Voter history
  - Has voter voted/received ballot
  - Update voter as issued ballot/voted
- Voter verification
  - Sign in/signature capture
  - ID check/swipe)

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Voting Methods/Models

- Initial specification expected for next VVSG:
  - Primarily, formal definitions (mathematical models) of voting methods, i.e., algorithms
  - Models implemented as precise and validated mathematical logic
  - UML model of voting methods universe, mapped to the EA business process models framework
  - Set of use cases to aid understanding & application
  - Reference set of packaged tools and examples for validating executable models modules in particular configurations

Voting Methods/Models Uses

- Audits, evidence-based election procedures, validation approaches and tests for voting system modules.
- VVSG, legislators, elections officials can reference precise voting methods definitions in legislation, rules, guidelines.
- Elections officials and administrators can unambiguously and precisely specify commonly understood requirements for operations on vote data sets in RFPs.
- Elections systems manufacturers, software systems providers and elections analysts can characterize systems with confidence.

Discussion