

IACREOT
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Usability of Electronic Poll Books

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Introductions

Who is here today?

Background


About the project

Goals for the project

Understand current e-pollbooks

- Capabilities and use in elections
- How they affect the polling place

Look specifically at usability

- How poll workers use them
 - How they help poll workers serve voters
 - Training required
- 

Survey of current e-pollbooks

- Fact finding interviews election officials in 22 states or counties
 - Who use e-pollbooks
 - Or were considering them
- Demos and reviews of 13 systems
 - 11 commercial e-pollbooks
 - 2 e-pollbooks built by election officials

Election Offices

- Colorado
 - Connecticut
 - District of Columbia
 - Georgia
 - Indiana and VSTOP
 - Maryland
 - Michigan
 - Minnesota
 - New Jersey
 - Ohio
 - Wisconsin
 - Virginia
 - Wyoming
 - Austin, Texas
 - Cook County, Illinois
 - Fulton, Pennsylvania
 - Minneapolis MN
 - Nevada County, CA
 - St. Louis County, MO
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E-Pollbooks

- Robis Elections – Ask ED Pollbook
- VR Systems – EVid
- ES&S – ExpressPoll
- Votec – VoteSafe
- ScytI/SOE– Clarity ePollBook
- EA – EA Tablet
- EasyVote – EasyPollbook
- DemTech – Plexus
- KnowINK –PollPad
- Tenex – Pollbook
- EveryoneCounts – eLect
- Michigan
- Utah

We heard about: constraints, benefits, and drawbacks

- Legal constraints on use
- Benefits
- Drawbacks

E-pollbooks in elections code

Status	Language in the election code
Prohibited	Language explicitly prohibits the use of electronic poll books, or includes language that effectively disallows them.
Neutral	There is no language or procedures in the code that cannot be done with an electronic poll book.
Allowed	Explicit language allowing EPBs or specifying procedures for their use.

State certification or approval

Requirements	Description
No requirements	No requirements in the state election code. Counties may choose to use electronic poll books or not.
Data compatibility	Requires only compatibility with the state voter registration format
Certification	EPBs must be approved through a state certification process. Examples: <ul style="list-style-type: none">• Indiana has a full certification process conducted by the state with an advisory program (VSTOP) at Ball State University• Ohio has an approval process conducted by a state board
Approval	The state approves vendors and products from which counties may select, or approves products on a case-by-case basis, but without a formal certification process.

State may require specific e-pollbooks

Requirements	Description
Single system	<p>The entire state uses a single product. Local elections offices are either required to use it, or must use it if they use an EPB</p> <ul style="list-style-type: none">• Michigan and Utah have a system managed by the state Department of Elections• Colorado's Uniform Voting System will include an electronic poll book
EPB as part of a voting system	<p>The EPB is a component in a state-wide voting system.</p> <ul style="list-style-type: none">• Some voting systems create a voter access card (or similar technology) that activates the voting session, and which updates an electronic voter list.• Maryland and Georgia have a single voting system for the entire state which includes an electronic poll book

Benefits

- Accuracy at the polling place
- Faster voter check-in
- Connected e-pollbooks enable vote centers

Drawbacks

- New technology in election administration
- Challenges to poll worker acceptance of new technology in the polling place
- Cost



What do e-pollbooks do?

Summary of the landscape analysis

What is an e-pollbook (physically)?

Hardware	Variations
Device	Laptop (usually Windows) Tablet (Windows, Android, iPad, iPad mini)
Operating system	Windows, Windows 7, Windows 8 Android, iOS (Apple)
Scanner for ID	External, or tablet camera
Signature capture	External device, or tablet screen
Case or stand	Wide variety of custom cases and stands
Printer	Small label printer (often Brother), may be bluetooth
Other	Link to printer for ballot-on-demand
Mobile apps	Mobile app for line management

What does an e-pollbook do?

- The most basic function: Check in a voter
 - Find a voter in the database
 - Review the voter record to confirm their identify
 - Collect the voter's signature or other identification
 - Issue the ballot or any authorization materials
 - Mark the voter as having voted

What does an e-pollbook do?

- They also
 - Identify the correct polling place for a misplaced voter
 - Collect updates and new registrations electronically
 - Synchronize with other poll books or the VR database
 - Facilitate communication between office and polling place
 - Provide instruction and scripts for poll workers
 - Facilitate updating voter history
 - Allow a central office to monitor polling place activity
 - and....

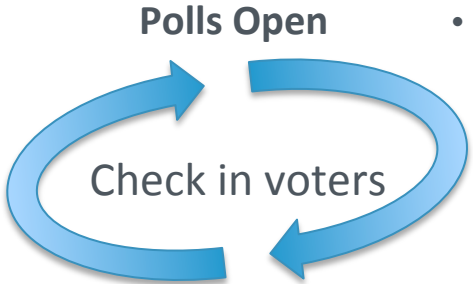


Connectivity

Scope	Impact of ED admin
EPBs synced with central	Immediate ED updates (e.g., mail-in ballots, voter registration) between polling places and central
Periodic voter record updates (central => EPBs)	Central updates (e.g., mail-in ballots, voter registration) sent to polling places Intermediate updates handled manually
Periodic voter record updates (EPBs => central)	EPB updates (e.g., voter history, voter registration) sent to central
None	Updates handled manually

E-Pollbook election journey

Pre-Election	Election Day		Post-Election
<p>Prepare voter registration lists</p> <ul style="list-style-type: none"> • Pull voter records • (Transform format) • Load e-pollbooks • Set up access for poll workers <p>Training/Support</p> <ul style="list-style-type: none"> • Scripts/prompts in e-pollbook 	<p>Setup</p> <ul style="list-style-type: none"> • Set up system • Connections • Supplemental updates <p>Live Communication</p> <ul style="list-style-type: none"> • Data updates • Status of polling place • Messages to and from the polling place • Support questions <p>Reports and Status</p> <ul style="list-style-type: none"> • Turnout and lines • Mid-day voter lists 	<p>Closing</p> <ul style="list-style-type: none"> • Shut down system • Final reports or reconciliation <p>At the Polling Place</p> <ul style="list-style-type: none"> • Voters in wrong location • Already voted • Provisional ballots • Election day registrations • Voter information updates 	<p>Return</p> <ul style="list-style-type: none"> • Collect final records from EPB <p>Election Reporting</p> <ul style="list-style-type: none"> • Election checks & audits • Turnout analysis • Voter history



Variations in connectivity

Less connectivity

Constant connectivity

e-pollbook
replaces
printed
rosters

e-pollbooks
connected
within a
polling place

e-pollbooks
connected
within a
county on
election days

polling place
has direct
connection
to state
database

E-pollbook Usability

What do we need to consider

Understanding usability for e-pollbooks

Usability is a measure of the effectiveness, efficiency, and satisfaction achieved by a specified set of users with a given product in the performance of specified tasks.

In this case:

- The product is the electronic poll book
- The users are the poll workers
- The tasks are the different scenarios and associated activities

Usability: Efficiency

The **efficiency** with which poll workers can complete both routine and unusual tasks.

- Can e-pollbooks speed up voter check-in and reduce lines at the polling place?
- Is the design optimized for the most frequent tasks?
- Does the design help poll workers identify voters and special circumstances quickly?
- Can updates be completed in a reasonable amount of time?

Usability: Effectiveness

Effectiveness is the measured by the accuracy with which poll workers can handle each voter. For example, can they:

- Find and identify the correct voter registration record
- Recognize any special conditions, such as whether they have already voted or identification requirement
- Take appropriate action to check the voter in or deal with any special requirements
- Complete any administrative procedures such as logging unusual events or updating records

Usability: Satisfaction

Satisfaction is a measure of poll workers' attitude towards electronic poll books. This includes both positive attitudes and by a lack of negative attitudes about them.

Do poll workers believe that electronic poll books:

- Help them do their job well
- Make finding voters easy
- Let them check voters in quickly
- Help them interact with voters in a helpful way

Usability is in the details

- Presentation
 - Visual hierarchy – what stands out on the screen
 - Information display – data grid or human-readable
 - Clarity or clutter
- Navigation
 - Efficiency - Steps or screens to complete a common task
 - Learnability - Access to less common tasks
- Work process support
 - Labels – does terminology match procedures
 - Reminders – does the interface help support tasks

Example

Finding a voter

- How easy is it to enter a search?
- How many screens does it take from home to voter record?



Example Voter lists

- How easily can a poll worker find a voter in the list?

Voter ID	Last Name	First Name	MI	Address
95852348611	Doughtery	Jordan		23 Chestnut, Maple
76654123123	Driver	John	L	1545 Tates Drive, Br
54788232367	Driver	Melinda	K	1545 Tates Drive, Br

Name	Address	Voter ID
Doughtery, Jordan	23 Chestnut, Maple	95852348611
Driver, John L	1545 Tates Drive, Berwyn	76654123123
Driver, Melinda K	1545 Tates Drive, Berwyn	54788232367

Example

Voter status

- Can pollworkers easily see the status of each voter?
- Are the indicators easy to understand?

S	Name	Address
★	Doughtery, Jordan	23 Chestnut, Maple Grove
✓	Driver, John L	1545 Tates Drive, Berwyn
	Driver, Melinda K	1545 Tates Drive, Berwyn
✓	Driver, Samantha	1545 Tates Drive, Berwyn

Status	Name	Address
ID Req'd	Doughtery, Jordan	23 Chestnut, Maple Grove
Voted	Driver, John L	1545 Tates Drive, Berwyn
	Driver, Melinda K	1545 Tates Drive, Berwyn
Voted	Driver, Samantha	1545 Tates Drive, Berwyn

Example

Voter details

- Does the layout make the name easy to see

Voter ID	00000000001
Last Name	Doughtery
First Name	Jordan
Middle Name	
Sex	M
DOB	08/01/1963
Address	123 Chestnut
City	Maple Grove
Zip	08888

Jordan Doughtery

August 1, 1963 - Male

23 Chestnut, Maple Grove

Usability testing

A method for testing usability

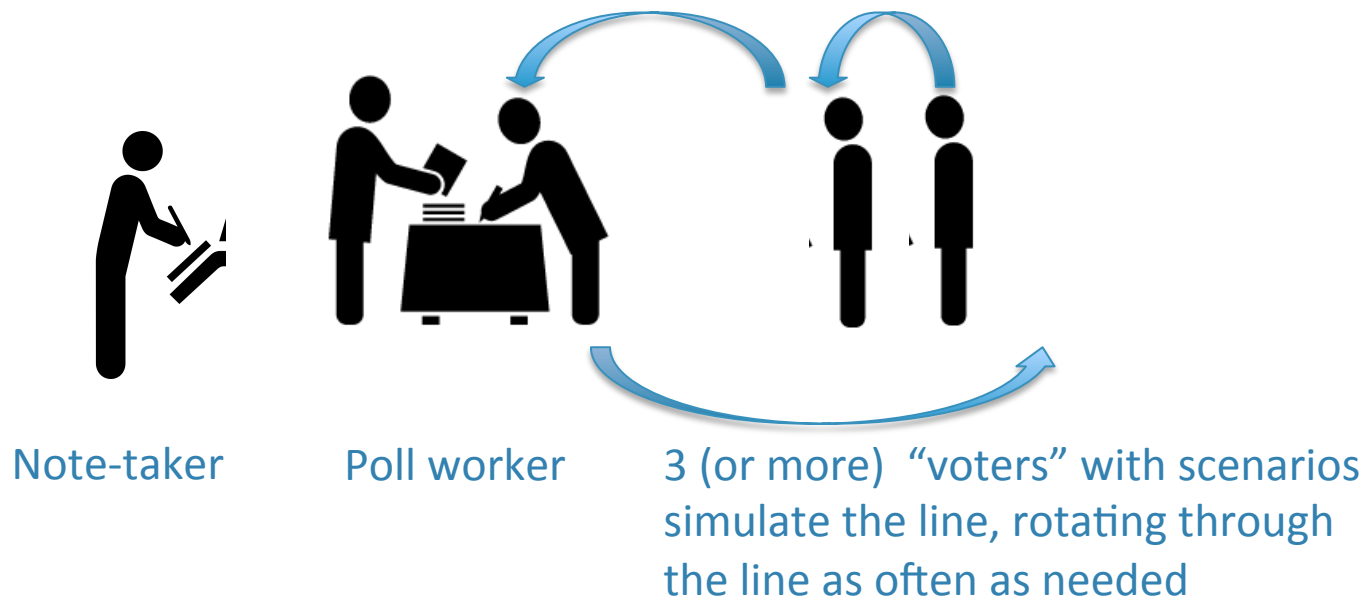
Possible uses for a usability testing method:

- Formal test protocol
 - Benchmarking or comparing systems
 - Certification
- Informal uses of usability testing
 - Purchase decisions
 - Planning poll worker training

Concept: Watch and learn

- Simulate field conditions
- Observe poll workers actually using an e-pollbook to check-in voters
 - What's easy, intuitive?
 - What's difficult, confusing?
 - What's the overall experience like?

A simple test setup



The basic session repeats

Repeat with 6-10 participants (acting as poll workers)



Poll worker 1



Poll worker 2



Poll worker 3



Poll worker 4



Poll worker 5



Poll worker 6

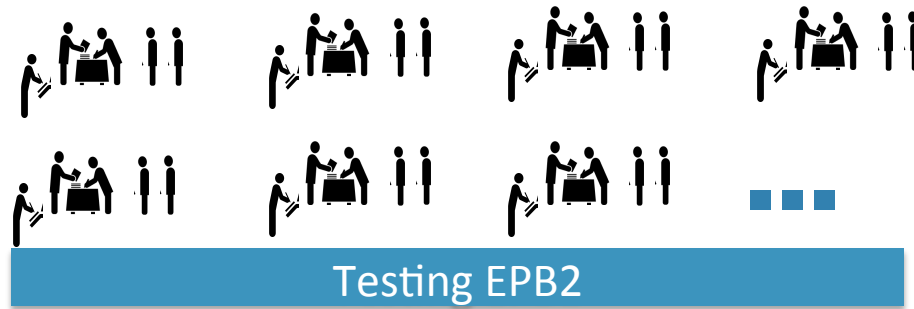
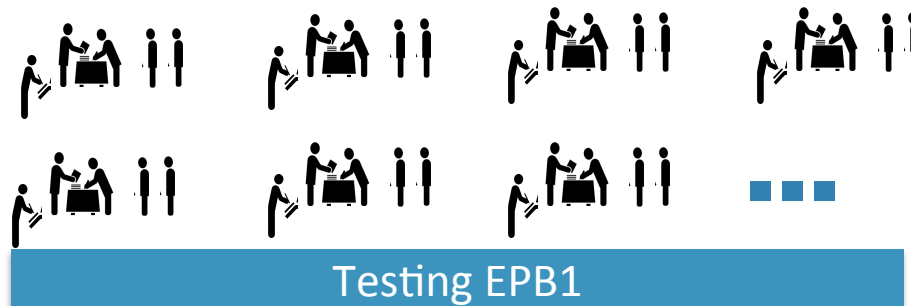


Poll worker 7



Comparing two or more e-pollbooks?

Repeat entire process for each e-pollbook being tested



Scenarios

- Voter is registered, in correct polling place with ID variations
- Similar/same names
- Registered but in wrong place
- Already voted
- Not in database at all
- Updates

Include set up and shut down?

The usability test can include

- Setting up at the beginning of election day
 - Unpack and set up communications
 - Morning supplemental updates
- Shut down at the end of election day
 - Reports and other updates
 - Shut down and pack up

Analyzing the data

- What scenarios did all poll workers complete successfully?
- What scenarios did most or all poll workers have problems with?
- How consistent are the types of problems participants had?
- How similar are the number of different problems each participant had?
- Are there differences in success scores for experienced/inexperienced/first-time participant poll workers?

Comparing e-pollbooks

- What differences do you see in the completion scores for common/uncommon scenarios between the epoll-books?
- What differences do you see in the completion scores for experienced/inexperienced/first-time participant poll workers between the e-pollbooks?
- If your poll workers participated twice, once on each e-pollbook, what is their subjective reaction to the e-pollbooks? Do they have a preference and why?

Can problems be minimized or fixed?

- Could changes in training help poll workers be more successful?
- Are there customizable prompts or instructions on the screen that can be improved?
- Is the problem in the interface design or interaction?



Workshop / Discussion

What matters in e-pollbook usability

What usability issues matter to election administration?

Think about these questions:

- What issues do you anticipate (or have you experienced) around the check-in process?
- What usability-related benefits do you hope for around the check-in process?

Write your answers on individual pieces of paper and put them out on the table.



Share back from the groups

Let's hear from everyone about the usability problems they identified.

Discussion:

- Any issues raised at other tables that your group didn't think of?



Discussion

- Is the idea of a usability test for e-pollbooks useful?
- How might it be used?
 - For purchase decisions?
 - For certification?
 - To understand training needs?
 - As way for staff to walk through the features of a system?

Usability test scenarios

How do we test for usability

Scenarios – or tasks – let participants use the pollbooks, while ensuring that we cover as many different situations (and usability issues) as possible.

A scenario includes

- The potential usability issue being tested
- The voter situation
- What success or failure might be
- Any pollbook setup needed



Sample scenarios

Registered; in correct place; ID checking variations

Nickname	Scenario	e-pollbook setup Supporting materials
1. Regular voter Has drivers license	You are: Jordan Dougherty <street address> <city> <state> <zip> You have your driver's license with you	This voter, at that address, is a registered voter for this polling place, and has not voted. Materials: "drivers license" with scan code.
3. Regular voter Has a voter card	You are: Andrea Manciano <street address> <city> <state> <zip> You don't have your DL with you. You have your XXX	This voter, at that address, is a registered voter for this polling place Materials: "voter card" (no photo or scan code)

Sample scenarios

Similar / same names, hard to spell names

Nickname	Scenario	e-pollbook setup Supporting materials
5. Multiple duplicate last names	You are: Kim Miller <street address> <city> <state> <zip>	Voter is registered for this polling place The e-pollbook contains 5-10 voter records with the same last name in this polling place. One of the other voter records is Kam Miller. Materials: Do not use scanned ID
8. Same name, same address with Jr/Sr	You are: Sidney Davenport Jr. <street address> <city> <state> <zip> Add'l information: Your father (Sr.) lives at the same address and has the same name.	Sydney Davenport Jr (DOB 1990) is registered to vote in this polling place. Sydney Davenport Sr (DOB 1960) is registered to vote in this polling place. Both Davenport's have the same address. Materials: Do not use scanned ID

Sample scenarios

Voter flagged

Nickname	Scenario	e-pollbook setup Supporting materials
11. ID required	You are: <first> <last> <street address> <city> <state> <zip>	Voter is registered for this polling place. Voter is flagged as being required to show ID. Materials: Any photo ID
15. Voter marked as needing assistance	You are: <first> <last> <street address> <city> <state> <zip> Add'l information: You can't stand for long periods of time; you need to be able to sit while casting your vote.	Voter is registered for this polling place. Voter is flagged as needing assistance

Sample scenarios

In wrong place

Nickname	Scenario	e-pollbook setup Supporting materials
16. Wrong table/ precinct at polling place	You are: <first> <last> <street address> <city> <state> <zip> Voter is registered for this polling place but not for this precinct	You are: <first> <last> <street address> <city> <state> <zip> Voter is registered for this polling place but not for this precinct
17. Wrong polling place	<first> <last> <street address> <city> <state> <zip>	Voter is registered but not in this polling place

Sample scenarios

Already voted

Nickname	Scenario	e-pollbook setup Supporting materials
18. Voted earlier today	You are: <first> <last> <street address> <city> <state> <zip>	One of the “voters” cycles through the line a second time to trigger this scenarios
19. Already voted by early/mail	You are: <first> <last> <street address> <city> <state> <zip>	Voter marked as having already voted in this election.

Sample scenarios

Not in database at all

Nickname	Scenario	e-pollbook setup Supporting materials
20. Registered to vote by mail at the last minute	You are: <first> <last> <street address> <city> <state> <zip> You never voted before. You mailed in your voter registration info 3 days ago.	Voter not in the database. Address provided by voter is within the precinct/township
21. Claims to be registered, address is outside of precinct/township	You are: <first> <last> <street address> <city> <state> <zip> You are sure you voted last year at this location.	Voter doesn't show up in the database. Address provided by voter is within the precinct/township.

Sample scenarios

Updates

Nickname	Scenario	e-pollbook setup Supporting materials
23. Update name	You are: Rayan Rivero You legally changed your name to “Paz” last month and want to get it updated here too.	Voter is registered for this polling place
25. Register new voter	You are: Micah Hamilton <street address> <city> <state> <zip> You moved from another state recently. You have the proper ID showing your address is within the precinct	Voter is not in database. Voter meets the requirements showing residency and vote eligibility for coting in this precinct.

Wrapup

Next steps

- Complete our report
- Pilot test of the test by Center for Civic Design this summer
- Publish the test protocol and report on how it worked



Thank you.

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