

Usability & accessibility of next generation elections NIST Roadmap

Notes from the January 9, 2015 workshop

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A preliminary report on the workshop, January 9, 2015

This was the second of two workshops in a process to create a roadmap for developing usability and accessibility guidance, best practices, and standards for next generation voting systems that will help election officials, manufacturers, and other stakeholders to ensure that all voters can vote independently and privately.

The roadmap, when completed, will outline steps needed to produce this guidance for election officials, manufacturers, and other stakeholders. It will identify issues, gaps, new technology, and processes, how to develop guidance, as well as relevant research and best practices that can be used to improve voting systems given next generation technology.

In this second workshop, we:

- **Worked on possible objectives to include in the roadmap**
- **Identified benefits for voters, design challenges, opportunities for the election process, and risks**
- **Heard a presentation about the FDA human factors process for approving products and discussed its applicability to voting systems.**

About the Project

Background

NIST has worked on voting system standards since the Help America Vote Act of 2002, both establishing requirements for certification test labs and creating the Voluntary Voting System Guidelines (VVSG). The VVSG 2005 included the first comprehensive usability and accessibility standards for voting systems.

Elections are changing. There are new technologies, new research, new laws, and new elections procedures since the 2005 Voluntary Voting System Guidelines 1.0 were published. Keeping up with these changes requires a new approach to usability and accessibility guidance for election systems.

Recent years have brought changes to the state of the art and technology for voting systems, as well as public expectations about how voters will participate in elections.

Background (2)

Despite 12 years of work within elections on standards for usability and accessibility, the reality is that there are still many barriers.

Even newer systems show poor accessibility and usability, suggesting lack of knowledge of best practices and existing standards and guidelines. This is true of both voting systems and related technology.

As more jurisdictions have switched to paper ballots, there is even more isolation of the "accessible" voting system.

- The accessible systems may go unused through the entire day, further reducing the likelihood that they will be set up and ready to use.
- Systems for UOCAVA voters under the MOVE Act allow for online ballot marking. Disability rights groups advocate for making these systems available to voters with disabilities (or all voters). Security experts point out many pitfalls.

What is a roadmap?

A NIST roadmap is an outline for future work.

A roadmap:

- Identifies gaps in knowledge to be filled
- Identifies issues to be resolved
- Looks at technology, processes, standards & guidelines
- Recommend approaches to the work

It does not:

- Prescribe solutions
- Recommend specific guidelines
- Rather, it shows how to structure work to accomplish the goals

This roadmap will cover future guidance to ensure the usability and accessibility of election systems.

Possible goals for the roadmap

Increase the level of knowledge for how to design, develop, deploy, and use of usable and accessible elections systems.

- Promote consistent levels of usability and accessibility across technology in all parts of the elections process.

Make systems more usable for everyone in the elections process, including voters, poll workers, elections staff, and third-parties like election interest and advocacy groups or technology developers.

Shift from single focus on standards and certification to identifying the appropriate guidance and how to implement the guidance, including:

- Guidelines for best practices
- Procedural support
- Training

Where we are in the process

- October: Workshop 1 - blue sky, get lots of ideas on the table, explore priorities and gaps
- **Workshop 2 – Work in detail on elements to be included in the roadmap**
- Feb 9-10: Future of Voting Systems - Present draft of roadmap
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- April-May: Create final version



Results of the 2nd Workshop

Workshop participants

- Paul Aumayr, Maryland Department of Elections
- Juan Gilbert, University of Florida
- Dan Gillette, Gillette Design
- Diane Golden, ATAP
- Keith Instone, OVF E2E VIV Project
- Ed Israelski, AbbVie
- Jonathan Lazar, Towson University
- Shari Little, ES&S
- Ryan Macias, California Office of Voting Systems Technology Assessment
- Greg McGrew, Assistive Technology Partners
- Jessica Myers, EAC
- Brian Newby, Election Commissioner, Johnson County, Kansas
- Jim Tobias, Inclusive Design/Raising the Floor

- Emily Rhodes, University of Baltimore
- Caitlin Rinn, University of Baltimore
- Joel Stevenson, University of Baltimore

Structure of the day

- Introductions and goals for the workshop
- Recap of work to date
- Breakout topics: session 1
- Lunch talk on human factors in the FDA project
- Breakout topics: sessions 2 and 3
- Readouts and discussion

What issues must the roadmap address

We started the day by asking everyone to name one top priority for improving the usability and accessibility of future elections. They said:

Better understanding of voters and their needs

- Think broadly about voters and their abilities
- Having to relearn voting systems every few years is difficult for people with cognitive disabilities
- Make paper ballots fully accessible
- Involve more individuals with disabilities as poll workers

Thinking about the voting experience

- How should voting be similar to and different from everyday processes
- Making voting delightful
- Universal design: one system for all voters

Access to elections

- How to engage voters
- Access to voter education
- Voting from anywhere
- Personalization and socialization of voting
- Guidelines for novel interactions with voting systems

Continued



What issues must the Roadmap address (2)

Possible changes in the guidance, standards, and certification process

- Standards must address usability, accessibility, and security together
- Standards and the legislative process
- Raising the level of usability knowledge and design for voting systems
- Labs need better guidance and education concerning usability
- Standards that keep up with changes in technology

Possible changes in how systems are designed and tested

- Design and test systems for at-risk voters
- Test with the people who matter
- Change regulations to support iterative testing
- Access to real voting systems for researchers
- Implementation and pilots in the real world.

Breakout group topics

There were three breakout group topics:

How can the guidance and certification process be improved for better usability and accessibility?

How can we create guidance for the wide range of technologies in use in elections today?

What voter needs are not being met? How can we ensure equal access to voting options?

The groups rotated through the breakout topics during the first afternoon, working on objectives for the roadmap.

They used voter personas, the voter journey map, their collective experience, and ideas from other domains as input for the discussions.

Breakout topic worksheets

The breakout groups proposed and discussed objectives for the roadmap, identifying:

- Strengths: Benefits for voters
- Weaknesses: Design Challenges
- Opportunities: Election Process
- Threats: Risks of Failure
- Resources, research, related project and relevant standards

Title of potential roadmap element	

This will help: 	
Strengths: Benefits for Voters ▪ Description	Weaknesses: Design Challenges
Opportunities: Election Process	Threats: Risks of Failure
Resources, Research, Related Projects	Relevant Standards

One set of requirements: give all voters the best possible accessibility

In the VVSG, Chapter 3 is in two parts, for general usability and accessibility. Merge the entire chapter into one group of requirements, so that all of the requirements apply to all systems, giving all voters the best possible accessibility.

This will help:



Voters with disabilities who know they need access features

Voters who would benefit from access features, but don't ask for them

Poll workers and election officials

Strengths: Benefits for Voters

- Encourages a more robust universal design approach.
- Better accessibility for all voters such as choice of text size & contrast or audio reading of text.
- One voting system for all voters – no isolation of the accessible voting system.

Weaknesses: Design Challenges

- Could make systems harder to design well.
- Could lead to reduced range of access features.

Opportunities: Election Process

- Simpler standard. Easier to see all accessibility requirements.
- Easier certification with a single set of requirements.
- Easier setup at the polling place with one system for all voters, instead of a separate accessible station.

Threats: Risks of Failure

- Could make systems more expensive if not designed well.
- Voting system designers need education in universal design approaches.
- How would this work with component certification? Would all components have to meet all requirements?
- Does this make it easier or harder to identify success or failure in meeting HAVA accessibility requirements?

Resources, Research, Related Projects

AVT prototypes: EZBallot, Anywhere Ballot, Prime III etc.

Los Angeles VSAP,

Relevant Standards

Principles of Universal Design

WCAG 2.0 (POUR Principles)

Accessible UX Principles

Concepts developed as roadmap objectives

A theme across all of the discussions was the need to consider all stakeholders in all work.

- Voters
- Poll workers
- Election officials
- State election boards and standards
- Legislators
- Candidates and their campaigns

The concepts developed included 6 broad topic areas. The titles listed on the following pages are often a combination of several concepts introduced at different tables.

Concepts developed as roadmap objectives (1)

Supporting the design process

This group of objectives addressed gaps in how people interact with the current standards and how the quality of election design could improve through better practices.

- Design the standards and guidance so they are easier to use
- Qualifications of human factors evaluators
- Guidance on usability and accessibility process
- Sharing best practices

Concepts developed as roadmap objectives (2)

Engaging voters

The groups considered the voter experience outside of the actual voting process

- Election communications and use of social media
- Make voter education (with real voting systems) available to everyone.
- Improve voter guides

Concepts developed as roadmap objectives (3)

A broad view of the voter experience

These concepts encourage a broad view of the voter journey and the systems that support it

- 360° Voter Experience
- Human factors and security risk model
- Anywhere voting

Concepts developed as roadmap objectives (4)

Supporting evolving technology

The groups looked at how changes in technology has an impact on voting and voting systems

- Design guidance for a broad audience, flexible voting systems and more options
- Enable the use of personal devices and assistive technology in the voting process
- Update voting guidance to address interactions like touch, voice, gesture
- Create guidance for election activities outside of the “voting system”

Concepts developed as roadmap objectives (5)

Structure and content of the guidance and standards

This group of objectives looked at what we include in the guidance

- Merge usability and accessibility into a universal standard, identifying core requirements
- Develop process standards
- Simplify standards by focusing on principles rather than detailed requirements
- Develop performance metrics

Concepts developed as roadmap objectives (6)

Testing in the design and certification process

This group of objectives looked at how voting systems are evaluated

- Improve ways to test systems, including pilot testing as part of certification
- Certification of open, component-based election systems
- Educational programs on usability, accessibility, and design for people working on voting systems

Next steps

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