VVSG 2.0
Human Factors Requirements: Accessibility/Usability/Privacy

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VVSG 2.0 Human Factors Principles

1: High quality design

2: High quality implementation

3: Transparent

4: Interoperable

5: Equivalent and consistent voter access

6: Voter privacy

7: Marked, verified, and cast as intended

8: Robust, safe, usable, and accessible

9: Auditable

10: Ballot secrecy

11: Access control

12: Physical security

13: Data protection

14: System integrity

15: Detection and monitoring

Goal of the Human Factors Requirements

Voting systems that meet the human factors principles in the VVSG and are designed, implemented, and evaluated using best practices for user-centered design, usability, and accessibility.

HAVA Accessibility - Section 301 (3) and (4)

- HAVA includes requirements that voting systems:
  - **Are accessible for individuals with disabilities** with same opportunity for participation (including **privacy and independence**) as other voters.
  - Provide voters an opportunity to **verify their choices**, and **change the ballot** or **correct any error** before the ballot is cast and counted, in a **private and independent** manner.
  - Provide **alternative language accessibility** pursuant to Section 203 of the Voting Rights Act.

Goals for the accessibility and usability updates to the VVSG 2.0 Requirements

- Address issues that voters still encounter with accessible voting systems
- Catch up to current best practices in election systems
- Catch up to best practices in user interface design and usability
- Cover new technologies now in common use
- Match updated laws and standards
- Write clear, testable requirements

Usability

The effectiveness, efficiency and satisfaction with which specified users achieve specified goals in particular environments.

Definition from an international standard
ISO 9241

Accessibility

The extent to which products, systems, service, environments and facilities can be used by people from a population with the widest range of characteristics and capabilities to achieve a specified goal in a specified context of use.

Definition from an international standard ISO 9241

A universal design approach

Designing a product or service so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability.

Principles of Universal Design
Center for Universal Design at North Carolina State University

Clear Relationship to Other Laws and Standards

- Election laws
  - Help America Vote Act, Voting Rights Act
- Disability laws
  - ADA, Access Board ICT Standards “Section 508” and W3C Web Content
  - Accessibility Guidelines (WCAG 2.1)
  - Assistive Technology Act
- Technical standards and guidance
  - FCC Hearing Aid Standard
  - ISO Software Quality Requirements and Evaluation standards
  - FDA process requirements
  - NIST research reports

Key Updates to Requirements

Interaction details

- Text size and contrast
- Plain language
- Gestures and scrolling on a ballot
- Navigation from the review screen
- Navigation issues for long contests
- Remote accessible ballot marking
- Ballot review and verification

Landscape analysis

- Emerging assistive technologies that might be used In a polling place
- Reports and recommendations from the Accessible Voting Technology projects
- Election accessibility issue reports

And, user-centered design and usability testing by developers.

Equivalent and Consistent Voter Access Modes of Voting (Principle 5)

Consistent experience across the voting process and voting method

Equivalent information/options in all modes:

Presentation modes

- Visual
- Enhanced visual (text size and contrast)
- Audio

Interaction modes

- Touch
- Tactile controls
- Non-manual access

Voter Privacy (Principle 6) vs. Ballot Secrecy

Meets HAVA requirements for independent and private voting.

Voter privacy is separated from ballot secrecy (covered in Principle 10)

Voter privacy

- Privacy during voting including a voter's interaction with the ballot, modes of voting, and selections.
- Includes the ability to mark, verify, and cast a ballot without assistance.

Ballot secrecy

- Preventing links between a voter and a ballot after the ballot has been cast to prevent identifying how someone voted.

"POUR Principles"
Principle 7, Marked, Verified, Cast as Intended

- Principle 7 requirements are organized to match the principles of the Web Content Accessibility Guidelines (WCAG)

  Perceivable

  Operable

  Understandable

  Robust (covered in Principle 8)

- Detailed, research-based design requirements for the voter interface

Robust, Safe, Usable, and Accessible (Principle 8)

- Hardware, software, and accessories are robust and do not expose users to harmful conditions.
- Meets currently accepted federal standards for accessibility.
- The voting system is **evaluated for usability with a wide range of representative voters,** including those with and without disabilities, for effectiveness, efficiency, and satisfaction.
- The voting system **is evaluated for usability for election workers**.

User-centered design (UCD)

A way of building systems focused on meeting users' own goals. UCD includes activities and methods for discovering what users need, and what meets those needs.

Definition from an international standard
ISO 9241

High Quality Implementation (Principle 2, Guideline 2.2)

The voting system is implemented using **best practice user-centered design methods** that consider a wide range of representative voters, including those with and without disabilities, and election workers.

Usability Testing and User-Centered Design

- Principle 8 and Principle 2.2 require a process and specific approaches to usability testing voting systems including:
  - What aspects of the system must be tested
  - Who is included in the testing
  - When testing takes place
  - How the results of any usability test are **reported**
  - How the overall user-centered design process is **reported**
- Performed and reported by voting system developers

Thank you!