

Status of Public Working Groups: Human Factors Update

Shanéé Dawkins, Ph.D.

Human Factors (HF) PWG Approach

- Structure of Next Generation VVSG Usability and Accessibility (U&A)
 - Principles & Guidelines
 - Equivalent and Consistent
 - Cast as Marked
 - Marked as Intended
 - Tested for Usability
 - Meets Web Accessibility Standards
 - Core U&A requirements for all electronic systems
 - Universal design
 - E.g., contrast, font, WCAG
 - Technology-specific requirements
 - Devices, e.g., tablet computers
 - Interfaces, e.g., ballot selection representations
 - Interactions, e.g., touchscreen gestures

HF PWG Status

- 87 members, ~20 participants/biweekly call
- Core requirements discussions using Principles structure
 - Started with VVSG 1.1 requirements as base
 - Identifying changes to *core* requirements
 - Updates to requirements based on current best practices and research findings
 - Gaps where additional requirements or research is needed
 - Generalizing low level implementation-specific requirements
 - Improvements to clarity
- Currently working on Principle 3

HF PWG Status: Topics for Further Analysis

- Core universal design principles
- Requirements for component-based systems, preserving accessibility throughout voting process
 - E.g., addressing issues for paper-based systems and accessibility
- Use of personal assistive technology in the polling place
- Usability of voting system audio interfaces
- Testing with users to confirm adherence to principles
- New technology-specific requirements
- Usability of real-time help interfaces
- Additional topics

Human Factors & Use Cases

- For all election process use cases and systems
 - Follow core requirements
 - Consistent across user interfaces
 - Accessible
 - MUST follow legal accessibility requirements
 - User tested
 - Throughout product development lifecycle

Next Steps

- Finish core requirements discussions using Principles structure
- Write white papers on analysis topics for input to election PWGs
- Identify gaps for technology-specific requirements

Questions?

HF Principles & Guidelines

- **Principle 1: Equivalent and Consistent**
 - **All voters have access to mark and cast their ballot as intended, regardless of their abilities, without discrimination.**
- **Guideline 1.1**
 - Provide voters with a consistent experience of the voting process in all modes of voting.
- **Guideline 1.2**
 - Provide voters with equivalent information and options in all modes of voting.

HF Principles & Guidelines

- **Principle 2: Cast as Marked**
 - **Ballots are cast as marked, both secretly and privately.**
- **Guideline 2.1**
 - The voting process shall preserve the secrecy of the ballot.
- **Guideline 2.2**
 - The voting system must ensure that ballot selections, interface options, voter identity and information about voters are kept private.
- **Guideline 2.3**
 - The voting system supports the voter in marking the ballot accurately.
- **Guideline 2.4**
 - The voting process helps voters avoid errors that invalidate their ballot, including blank ballots, undervotes, overvotes, and marginal marks.

HF Principles & Guidelines

- **Principle 3: Marked as Intended**
 - **Ballots are presented in a clear, understandable way, and is operable by all voters.**
- **Guideline 3.1: Perceivable**
 - The default system settings for displaying the ballot work for the widest range of voters, and voters can adjust settings and preferences to meet their needs.
- **Guideline 3.2: Operable**
 - Voters and poll workers must be able to use all controls accurately, and all ballot changes are made with the direct control of the voter.
- **Guideline 3.3: Understandable**
 - Voters can understand all information as it is presented
- **Guideline 3.4: Robust**
 - The voting system's hardware and accessories support usability and accessibility requirements while protecting voters from harmful conditions

HF Principles & Guidelines

- **Principle 4: Tested for Usability**
 - **Meets performance standards for usability and accessibility.**
- **Guideline 4.1**
 - Conduct summative usability tests using a wide range of voters and poll workers, including those with and without disabilities.

HF Principles & Guidelines

- **Principle 5: Meets web accessibility standards**
 - **Browser-based systems meet web accessibility standards in addition to voting standards.**
- **Guideline 5.1**
 - When a voting system uses standard web software platforms (HTML or native apps), the voting system meets all requirements in VVSG 2.0 Level AA any applicable requirements in the VVSG.