Status of Public Working Groups: Human Factors Update

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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.