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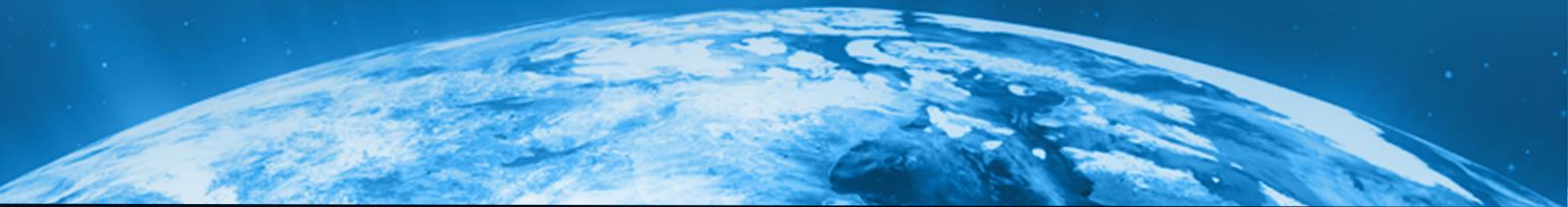
Problem. Solved.

ACCESSIBLE VOTING:
Voting System Design and Poll Worker Education

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Overview

- **Designing for accessibility**
- **Poll worker education for accessibility**
- **Poll worker assistance through better design**
- **Evaluating accessibility**

Accessible Design

Why should accessible design be considered during the design of voting systems?

- Usability testing is recommended by the Voluntary Voting Systems Guidelines[1] to enable voters to independently cast votes as intended.

- Voters with disabilities should be treated equitably in terms of privacy, convenience, usability, and respect.

... so that people with disabilities are not singled out and are treated equitably.

Source [1]: (VVSG 3.2.1.a)

Accessible Design

How should we include people with disabilities?

- Identify accessibility issues with existing systems via

    - Post-election surveys

    - Usability testing

- Ethnographic research: Observe disabled voters at polls (with consent)

- Solicit input from community support groups for specific disabilities.

- Develop design tools such as personas and video walkthroughs.

Design Tool Development & Use

Design Tool Development

- **Personas describe all of the relevant characteristics of a user**
    - **Goals, traits, expectations, knowledge, skills, [dis]abilities, etc…**
- **Designers should develop a wide variety of personas to represent variability in the population**

Design Tool Use

- **Perform a task analysis to identify performance requirements, information requirements, and potential errors.**
- **Determine whether each persona could perform the tasks successfully.**
    - **Perform Cognitive Walkthrough or similar techniques.**

Human centered design should in include the full range of human experience.

Systems Thinking

The design of voting systems should include all aspects of the system.

- Setup and maintenance.

  - Poll worker accessibility.

- Embedded help and documentation.

- Social etiquette and disability awareness.

- Ballot design.

- Poll environment.

Accessibility of the voting device is just one part of the system.

Poll Worker Training

Poll workers should be knowledgeable of

- How various disabilities impact voting

- Social stigma experienced by some individuals with disabilities

- Assistive devices that voters bring with them

- Assistive features of the voting machines

Training based on *personas* rather than *disabilities* may engender a more compassionate attitude.[1]

Source [1]: Koltay, Z. & Tancheva, K., (2009). Personas and User-centered Visioning Process. *Proceedings of the 2008 Library Assessment Conference.*

Poll Worker Training

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Poll workers should receive training on the full range of disabilities they may encounter, especially *hidden disabilities*, which may include:

Cognitive

- **Age-related cognitive impairment (mild, Alzheimer's, dementia, etc…)**
- **Traumatic brain injury**

Social/Cognitive

- **Autism Spectrum Disorder**
- **Anxiety and panic disorders**

Physical

- **Arthritis**

Poll Worker Assistance through Better Design

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Ideally, voters should never need poll worker assistance at the voting machine.

- Empower voters by delivering just-in-time, contextual help from the voting machine.

- Provide graphical instructions, which will especially benefit those with low English literacy or cognitive impairments.

When poll worker assistance is inevitably necessary:

- Design machines to be physically accessible to voter and poll worker simultaneously.

- Display system states/modes clearly to help poll workers identify problems and solutions

Evaluating Accessibility

Deficiencies in the Voting Machine Accessibility Evaluation Process

- Lack of standardization of test methods

- Low prioritization in the design process

- Design-based vs. performance-based criteria

- Inclusiveness of the participant population

- Focus is only on one aspect of the system

Evaluating Accessibility

Problem: Prioritization in the design process

- Accessibility testing is often conducted in late design stages.
- Issues discovered in late stages can be difficult to address, and design solutions may be poorly integrated.

Solutions

- Consider accessibility in early design phases (e.g., using personas and task analysis).
- Conduct iterative accessibility testing throughout design phases (formative and summative testing).

Evaluating Accessibility

Problem: Lack of standardization in samples

- What constitutes a *representative sample* of disabled users?
    - Should *all* disabilities be tested?
    - What about combinations of disabilities?
- How many users should participate in the evaluation?

Solutions

- Empirical studies might help to establish guidelines.
- Examine lessons learned from accessibility studies in other domains (e.g., websites, kiosks, in-home medical devices)

Standardization of test procedures will enable fair comparison among vendors.

Evaluating Accessibility

Problem: Insufficient evaluation criteria

- Many evaluations use design-based criteria, which may not translate to successful user performance.

Solution:

- Standardized user performance criteria should serve as benchmarks for success.
    - Successful task completion rates
    - Error rates, error recovery rates
    - Time on task

Challenge: How should we objectively establish pass/fail criteria? What is "good enough?"

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