VVSG 2.0 and Beyond: Issues and Gaps in the Usability and Accessibility Requirements

Approved by the TGDC for transmittal to the EAC on

January 14, 2011

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VVSG 2.0 and Beyond: Issues and Gaps in the Usability and Accessibility Requirements

The purpose of this document is to identify issues and gaps in Chapter 3, Usability, Accessibility, and Privacy, of the VVSG 2.0. This information will be used to guide and prioritize NIST research in support of improvements to requirements and associated conformance test methods for the VVSG 2.0 and subsequent updates. We focus here only on the usability and accessibility requirements.

The VVSG 2.0 was delivered by NIST to the EAC in August of 2007. In the past three years, voting system technology, other standards, and our understanding of the needs of voters, poll workers and election officials has deepened. While this "baseline" VVSG 2.0 was a clear improvement to prior versions of the VVSG in terms of organization and content, issues and gaps exist. They include:

1. Paper ballots and motor disabilities: Clarify requirements to ensure that an accessible voting system does not require a voter with motor disabilities to manually handle the paper ballot throughout the voting session, that is, to obtain, mark, verify, and cast the ballot). For example, a system must have an automatic paper handling mechanism or equivalent if paper ballots are part of the process.

2. Paper ballot usability and accessibility: Research and develop requirements to support better usability and accessibility of paper records for voters and for poll workers.

3. Accessibility of verification: Clarify requirements to ensure that an accessible voting system provides mechanisms that enable a voter with a disability to verify the content of a paper ballot using the same input and output features they use to generate that ballot. For example, someone with low vision or who is blind must be able to vote and verify using the same method for both activities.

4. Alternative input/switch input: Clarify requirements to ensure that an accessible voting system provides switch input or alternative input that provides equivalent access for voters with motor disabilities

5. New ADA accessibility technical standards: Harmonize VVSG requirements with other adopted accessibility technical standards, working closing with Access Board.

    a. Update wheelchair reachability requirements, harmonizing with new technical standards and anthropometry research for motorized wheelchairs.

    b. Harmonize with 2010 ADA and Section 508 refresh technical standards as they apply to voting equipment.

6. Maximizing accessibility: Research the range of input and output access features currently available through both universal design and assistive technology. Determine which can/should be built-in (required of) an accessible voting system and which can/should be allowed as an add-on personal assistive technology option. Goal is to maximize reasonable access to the widest range of functional limitations (due to specific disabilities or age) while minimizing complexity. Research should be cross-disability, considering features that address multiple disabilities. This will reduce the cost and complexity of the systems. Features available to the voter should be easy to select and to use.

    a. Personal assistive technology: develop requirements for plug and play, including input jack and scanning interoperability.

    b. Manual dexterity: Research the range of manual dexterity capabilities and map to the most optimal solutions that address that range. Note that a more holistic approach is needed because individuals with dexterity problems often have other disabilities. Development of requirements based on that mapping is needed. This includes clear requirements that ensure usability for those individuals who do not have use of their hands.

    c. Design for aging voters: Research the needs of an aging voter population and develop requirements as indicated by the research.

    d. Universal design: Examine the latest research for universal design and determine what applies to voting systems.

   e. Built-in/personal assistive technology tradeoffs: Focus on how to maximize universal design requirements to support accessibility while at the same time increasing the personal assistive technology capability. Personal assistive technology should not be viewed as a substitute for built-in accessibility but as an enhancement.

7. Accessibility of PCOS: Precinct count optical scanners (PCOS) are growing in use by states. At the time VVSG 1.0 was written, it appeared that Direct Recording Electronic systems (DREs) would dominate and many of the voter interface requirements were written with the focus on the DRE. Analyze the VVSG 2.0 requirements for how they apply to voter interfaces on precinct count optical scanners, which now have multiple voter interface options (e.g. larger visual displays and paper feeding mechanisms). For voters to effectively cast their ballot without assistance, these interfaces require a variety of motor and sensory skills.

8. Focus on required access *features*: The organization of access requirements by “disability” area has been problematic because access features do not necessarily fall neatly into one disability area (e.g. synchronized audio/visual output is an access feature used by individuals with vision, learning, information processing, cognitive, memory and other functional limitation). While this structure simplified the organization of VVSG 1.0 and reduced redundancy, it has led to misinterpretation of the requirements when it has been incorrectly assumed the access feature is meeting a particular disability need only. Clarify and reword/restructure as needed to better focus on required access features that must be delivered rather than “disability” areas addressed to ensure that all required access features can be readily identified.

   a. In addition, the VVSG should be organized either in a way that provides a central location for the “access requirements” or a way of readily identifying all the “access” features that must be available on the one legally mandated “accessible” system. The organization should at least provide a way to more easily identify and pull out the required access features so that election officials and others can use the requirements as the benchmark for determining what meets the legal requirement for "accessible".

9. Performance-based testing. The requirements for the manufacturers to report on usability testing and the test laboratory performance-based usability testing methods (those that involve test participants) need to be expanded to provide performance assessments for a reasonably wide range of functional limitations. In the case of manufacturer testing, without substantive definitions and descriptions of the functional limitations that should be included in such testing, terms like "blind and visually impaired" or "lacking fine motor control" do not ensure that a representative and reasonable range of individuals with vision loss nor a wide range of individuals with motor limitations will be included in functionality testing. Similarly, performance-based usability testing conducted by test laboratories need to include test participants across a sufficiently wide range of functional limitations to ensure the system is accessible and usable.

10. One integrated accessible system. It is the intention of VVSG 2.0 that the accessible system is one, single, integrated system. The structure of VVSG 2.0 does not allow for separate components, which, when cobbled together address the various single disabilities. Clarify this intention with explanatory text and examine the structure of VVSG 2.0 to ensure that this intention is correctly represented.

11. Remote voting: The Election Assistance Commission should clarify and affirm the legal basis under HAVA, UOCAVA, ADA and for States for accessibility requirements as it pertains to the TGDC and NIST. Depending on scope, develop specific technical requirements addressing remote voting and the range of voting done outside of a polling place, absentee, and by mail.