

Accessible Voting Technology: Analysis and Recommendations

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Goal

- To provide guidance about how to develop more accessible and useable electronic voting systems based on:
 - Review of the Voluntary Voting System Guidelines (VVSG Draft 1.1)
 - Review of relevant standards and guidelines (e.g., Section 508)
 - Observation of past, present and prospective future voting systems

Outcome

- Generated a report for the ITIF Accessible Voting Technology Initiative:
 - <http://elections.itif.org/reports/AVTI-004-Cook-Harniss-2012.pdf>

Voting Systems Reviewed

Manufacturer	Name
Hart	eSlate (with VVPAT)
Hart	eSlate
Diebold/Premier	AccuVote TSX
Diebold/Premier	AccuVote TSX (prototype)
ES&S	iVotronic 6-Key (accessible)
Sequoia	Edge2Plus
Avante	Vote Trakker
IVS	Inspire
ES&S	AutoMark VAT
ES&S	AutoMark VAT with AutoCast
MicroVote	Infinity Voting Panel (with Double-talk A/V device)
ES&S	DS200i
Unisyn	OpenElect OVO
Unisyn	OpenElect OVI
NIST	Prototype voting system
EveryoneCounts	Ballot on Demand System

Vendor Presentations Attended

- Democracy Live: <http://www.democracylive.com/>
- Dominion: <http://www.dominionvoting.com/>
- ES&S (Election Systems and Software): <http://www.essvote.com/HTML/home.html>
- Everyone Counts: <http://www.everyonecounts.com/>
- eVOTZ: <http://www.evotz.com/>
- Helios: <http://heliosvoting.org/>
- IVS: <http://www.ivsllc.com/>
- Microvote: <http://www.microvote.com/>
- Open Voting Consortium: <http://www.openvotingconsortium.org/>
- Oregon Secretary of State Elections Division: <http://oregonvotes.org/>
- Prime III: <http://www.primevotingsystem.com/>
- Scantegrity: <http://www.scantegrity.org/>
- Scytl: <http://www.scytl.com/>
- Unisyn: <http://www.unisynvoting.com/>

Organization

- VVSG 1.1 is organized by disability, we organized by functional feature groupings:
 - Operability
 - Adjustability
 - Discernability
 - Understandability
 - Usability Testing

Analysis

- For each functional category, we
 - describe the associated VVSG requirements,
 - describe their purpose,
 - provide analysis about the extent to which requirements are being met in current or proposed voting systems,
 - and offer recommendations for improvement of the requirements and implementation strategies.

Example: Operability

- Accessing the Machine: Approach and Physical Space



Example: Adjustability

- Font, Contrast, and Color Adjustment

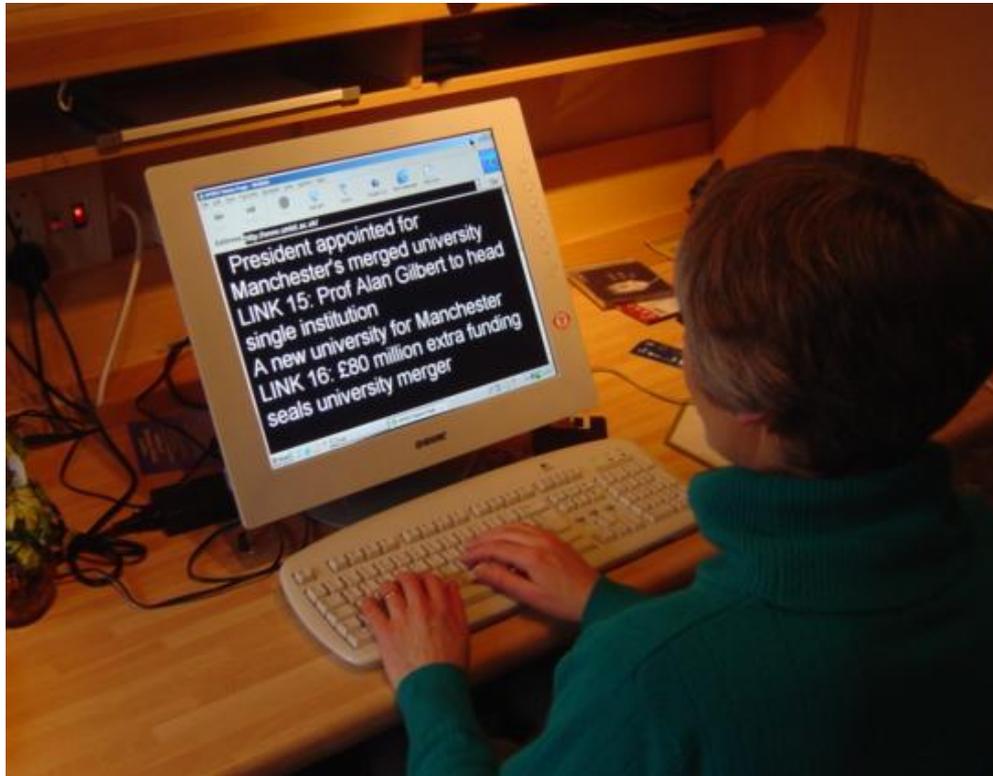
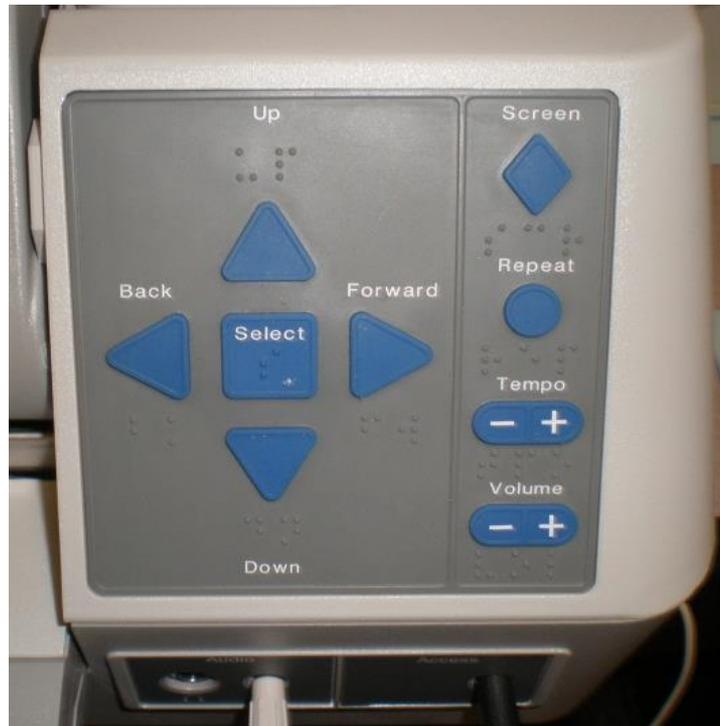


Image credit: <http://www.webbie.org.uk/webbie/>

Example: Discernibility

- Function and status of controls and keys



Example: Understandability

- Availability and clarity of instructions

Audio	Text on Screen
<p>Welcome to the visually impaired ballot system. Please be methodical and patient when using the audio ballot.</p> <p>You may increase the volume by pressing [[interruption: the instructions don't match]] or lower it by pressing the 1 key.</p> <p>If you wish to increase the playback speed, press the pound key at any time. Press the star key to decrease the playback speed.</p> <p>At each step the system will present a list of keypad options to cast votes and navigate the ballot. You may make your selection at any time.</p>	<p>To vote for a candidate, touch the box next to the candidate's name. An 'X' mark will appear in the box to indicate your intent.</p> <p>If you accidentally select then wrong candidate, or if you simply wish to change your vote, touch the mark that you wish to remove and it will disappear. You may then touch the box next to another candidate.</p> <p>The ballot may span several pages. To move forward to the next page, touch the Next button and it will be displayed. You may move backwards at any time by pressing the Back Button.</p>

Example Usability Testing



Developer watching videotape of usability test.

(Image credit: blog.templatemonster.com)

Conclusions

- Current guidelines were too specific for certain disabilities and vague for others.
 - Increased emphasis will be intellectual disabilities.
- Guidelines and practices should not be focused on existing technology.
 - If we tell you that putting a nib on the 5 key makes it accessible, you may choose to eliminate the keypad and avoid the requirement. Is that product accessible?

Recommendations

- Develop functional, rather than disability specific, guidelines
- Expand usability testing requirements
- Engage in additional research and development