Increasing Accessibility to Voting with New Technology

An Everyone Counts® White Paper
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INCREASING ACCESSIBILITY

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Every eligible voter, regardless of disability, deserves the opportunity to exercise his or her right to vote. The Universal Declaration of Human Rights, which was adopted by the United Nations in 1948, recognized the right of each person to elect their leaders at the ballot box by means of “periodic and regular elections.”¹ Yet, millions of citizens with visual, motor and cognitive impairments are unable to do so using traditional paper forms and in-person voting systems.

- In the 2008 U.S. General Election, 44% of registered people with disabilities who did not vote cited “illness or disability” as the reason for not voting.
- The U.S. Federal Election Commission reports that, in violation of state and federal laws, more than 20,000 polling places across the nation are inaccessible, depriving people with disabilities of their fundamental right to vote.²
- Due to the inaccessibility of polling places and implemented voting systems, people with disabilities are 20% less likely to vote.³
- According to the U.S. Government Accountability Office, 46% of polling places had an accessible voting system that could pose a challenge to certain voters with disabilities.
- About one-fourth of people with disabilities (26%) gave “permanent illness or disability” as their reason for not being registered to vote.

“Today many obstacles still exist in front of disabled people to cast their vote independently due to inaccessibility of premises voting booths or ballots, not to mention those of us who cannot leave our homes.”

– Mr. Yannis Vardakastanis, European Disability Forum President 2008.

¹ Universal Declaration of Human Rights, adopted by the UN on December 20, 1948 and Advantages of external voting via the internet, by Richard W. Soudriette, President, Center for Diplomacy and Democracy.
² http://www.accessiblesociety.org/topics/voting/
³ http://www.accessiblesociety.org/topics/voting/
ACCESS TO POLL-CENTERS

Software allows voters with disabilities to access their ballot at central or mobile poll-centers, giving them the ability to vote independently and privately, often for the first time.

- More flexibility on setting up Poll-Centers.
- Use any computer, laptop, tablet, or smartphone as a voting device.
- Use preferred assistive technology devices.
- Cost effective for election administration.

MORE LOCATIONS CAN BECOME POLL-CENTERS

A jurisdiction can choose to use software in a kiosk-type environment or in a mobile voting unit fully accessible by voters with disabilities, they do not have to worry about purchasing and servicing expensive hardware as is currently the case with Direct-Recording Electronic (DREs) voting machines and Ballot Marking Devices (BMDs) used in the polling place. They can use PCs, laptops or tablets they already have and then redeploy for use elsewhere after the election. Elections can be created that are fully compliant with Section 508 and Web Content Accessibility Guidelines (WCAG) 2.0 standards. Users of Assistive Technology can easily navigate the simple layout with their own switch access device (such as Sip and Puff or Paddle devices) connected to a computer in the same manner that they usually interact with the internet. Ballots can be created which work with screen readers such as JAWS, Window-Eyes and NVDA for Windows PCs as well as VoiceOver for Mac and VoiceOver for iOS (for iPad and iPhone users).

Software solutions are not dependent upon setup at the polling place. Machine-specific training of poll workers becomes unnecessary, so setup issues related to DRE and BMD devices can be averted, such as the lifting of heavy equipment or difficult assembly. Online ballot marking uses communications tools, such as PCs, smartphones or tablets, which already exist in or near the voter’s home. These options allow for the voter to use the assistive devices which they are most comfortable using, while removing the burden of travelling to a polling place.

Software can allow voters to access their ballot from almost anywhere. Effectively this is because it allows any web-enabled device, including desktop computers, laptops, tablets and even smartphones to operate as a Poll-Center. They can use any device and web-browser to access the jurisdiction’s election website, either online or offline.
This provides election administrators with the option to convert almost any accessible location with internet access into a ‘Polling-center’. These could be existing government or associated buildings, such as libraries and post offices. The jurisdiction can use existing publicly accessible computers if already available at these locations, or easily set these up temporarily in such environments.

Voters can simply access the jurisdiction’s election website on any device and internet browser (such as Internet Explorer, Chrome, and Firefox, etc.) and input their unique secure authentication credentials to login and access their ballot. The software automatically serves up the correct ballot relevant to each individual voter, based on their jurisdiction. It displays, just like a traditional paper ballot, meeting all the legal and regulatory requirements for ballot design and layouts.

**POLL-CENTERS CAN BE TAKEN TO THE VOTER**

Another major transformative effect of adopting state-of-the-art software solutions is the new option to create mobile Poll-Centers. Because a complete election can be administered on any device, including laptops and tablets, it can be easily transported and used in any location.

A complete electronic poll-station can consist of a single internet ready laptop or tablet, it can also include printers if paper ballots are preferred or required. In either case it dramatically reduces the costs associated with traditional solutions, enabling jurisdictions to provide transportable ‘Poll Centers’.

In a special US primary election in November 2011, Oregon’s voters needing special assistance in five counties used iPads to access and mark their ballots in the state’s Accessible Voting Pilot Project using a system designed and implemented by Everyone Counts, Inc. Ballots were securely accessed and marked using iPads and then printed, resulting in a 1500% increase in the use of the accessibility solution. This success has led to the systems adoption statewide in 2012 for voters with disabilities, as well as its expansion to Military and Overseas voters. The solution operated with online and offline versions, so that it could be used in locations with no or limited internet access. The Colorado Secretary of State (U.S.) announced plans for the adoption of the same mobile polling-center solution using Everyone Counts’ software and iPads for the primary and general elections in 2012.
One of those significant and high impact ways that software improves an election comes in the form of the ballot itself. An electronic ballot can directly and securely replace the traditional paper version in a polling center. It provides ways to make a ballot far easier to understand and navigate for all voters, including those who are presented with challenges or barriers through traditional paper methods such as individuals with disabilities. It also eliminates the issues voters experience in accurately marking selections.

Paper ballots by themselves are completely inaccessible for voters that are blind or who have visual impairments. It forces a reliance on others to guide, assist or even to cast a ballot on the voter’s behalf. This denies a core principle of democracy – voter privacy.

Software replaces the reliance on paper and the need to provide made-for-purpose voting machines, which typically require expert setup and training. Using software also reduces misunderstandings regarding how a ballot needs to be marked. Examples of this in recent years have involved write-in candidates. In many jurisdictions, a vote for a write-in candidate will not be counted unless a mark is also made to indicate the voter’s intention. Many voters have registered surprise that they had to do both, expecting that inserting a name would be sufficient. Legibility issues of a handwritten name on a paper ballot are also resolved by typing. In both cases, software is protecting the legitimacy and accuracy of the vote.

Navigation and marking a selection on a ballot screen, through standard keystrokes or mouse movement, also leads to increased ease and accuracy. The provision by jurisdictions of commonly available PCs and tablets, or use of the voters own choice of device, results in an even more familiar navigation and marking experience. The use of such devices removes the possibility, and therefore the problem, of insufficiently marking a selection or creating a mark that makes the voter’s choice unclear.

Some election jurisdictions have introduced made-for-purpose accessible voting devices in polling places. Although these have improved access for voters with disabilities, they are typically expensive devices, which limit their availability. Due
to the fact that they require expert setup and management, it also restricts their placement beyond traditional Poll-Centers. Voting cannot truly be called accessible unless all forms of voting are fully and fairly accessible to voters with disabilities. Commercially-Off-The-Shelf (COTS) web-enabled devices including PCs, laptops, and tablets inherently provide improved accessibility, because voters are typically familiar with how they operate. Navigating and marking a ballot using familiar keystrokes, mouse clicks, or screen-touch movements is commonplace today among most of the electorate.

Because COTS devices are generally less expensive than made-for-purpose machines, both in terms of direct purchase cost and on-going maintenance and storage costs, this enables a jurisdiction to provide more devices, and hence easier access. The size and weight of COTS devices is also invariably much smaller than made-for-purpose devices, which allows the jurisdiction to ship, or simply carry, these devices to more locations, more easily. This supports the expansion of voter access.

Most voters with disabilities that have an impairment that could affect their use of the internet, have a computer or telephone that has been adapted to suit their needs. Online voting, by working with these adaptive devices, allows these voters to vote from home without the loss of privacy implied by manual assistance.

Online ballot marking systems are portable and can be used in a kiosk, or as part of a mobile voting center that targets Voters with Disabilities before the election. They can take the form of either a laptop or tablet (iPad or Android) and can be equipped with common assistive technology, such as audio with headphones, zoom and contrast capability, and the ability to connect switch access devices (such as sip and puff, paddles, and jelly bean switches).

Perhaps the most universal tactile interface in the world is the telephone keypad, and it provides an extremely user friendly input method for the newly blind. The telephone option offers clear instructions at the start of the ballot and within each contest. Volume and speed controls provide the ability to make changes and to hear a summary of ballot choices before casting a completed ballot paper.

Issues with overvoting can be eliminated by using software, so that a voter is prevented from selecting more than the allowed number of candidate choices. Unintentional undervoting can also be eliminated so that a voter is warned if they have failed to vote in a contest or if they selected less than the maximum number of allowable votes in a contest.
NEW SOUTH WALES, AUSTRALIA

A new electronic voting system at the NSW state election was declared highly successful, with four times as many people using the technology than the NSW electoral commission had hoped. The system was introduced to help people with a disability or who found it difficult to get to a ballot box, by enabling them to vote via the internet or over the phone.

Electoral commissioner Colin Barry was quoted as saying it was initially thought that a maximum of 11,000 people would cast their vote through the digital system. But at the State election in March 2011, almost 47,000 used it, “iVote has been well received by people who are vision impaired, or who have another disability,” Mr. Barry said in a statement.

Australia’s Sydney Morning Herald newspaper subsequently referred to a voter who had lost his eyesight. It quoted the difficulties he faced, “having to get someone to read bank statements and letters to you, to telling someone to vote for you – and not having a choice. That is an emotional and personal impact that family members and the community don’t quite understand – how much you rely on the support of others.” As a result, he named the iVote voting system, used in that year’s state election, as one of his greatest achievements for the 100,000 blind people in NSW, “Not having to tell anyone how you vote, the fact that you don’t have to ask somebody, is significant.”

FRANKLIN COUNTY, WASHINGTON, USA

In the 2009 U.S. primary and general elections, Everyone Counts provided electronic ballot delivery targeted for use by voters with disabilities. Some of the features touted in voter feedback included the ability to use the JAWS screen reader and the ability to mark the ballot with a computer instead of by hand. Most users found the screen easier to read than a traditional paper ballot. Fifty percent of the voters who participated in the Franklin County election answered an online survey. When asked if they would use the solution if offered again, 94% of respondents said “yes.” Voter comments included: “It’s difficult to open envelopes, draw lines and stuff envelopes due to my disability.” “I like the simplicity; it’s pretty easy to understand.” “[It is] hard for me to get to and from the mailboxes.”
OPERATION VOTE.
FORT SAM HOUSTON IN SAN ANTONIO, TEXAS

Everyone Counts, participated in Operation VOTE, a project conducted by the Federal Voting Assistance Program (FVAP) to test the accessibility of voting systems for soldiers with disabilities or injuries. The simulated voting event took place July 25-27, 2011 at the Brooke Army Medical Center at Fort Sam Houston in San Antonio, Texas.

Everyone Counts trained soldiers on their audio voting system, which could be used by the visually impaired and those with prosthetic limbs, as well as by those with other impairments. The unique system requires the voter to only use two keys to vote and navigate their ballot and provides the lowest learning curve possible for a standard web page. The event was an accurate simulation of how a remote voting kiosk would function in an overseas military hospital.

IPAD VOTING
OREGON AND COLORADO, USA

Working with the Oregon (USA) Secretary of State, Kate Brown, Everyone Counts developed a solution that was customized to take advantage of the accessibility features inherent in the Apple iPad. The small size of the devices, in comparison with DRE systems, allowed them to be used as mobile accessible voting stations so that Oregon could bring accessibility to the voter. The original pilot was in November 2011 and was so successful, with highly favorable reviews coming from around the globe, the State chose to continue the pilot during the 2012 Primary Election. Colorado (USA) Secretary of State, Scott Gessler announced a pilot project in Denver, which would provide online ballot access and marking using the same Everyone Counts’ iPad technology as in Oregon. The goal of the project, being used in the Colorado primary and general elections in 2012, is to make voting more accessible to persons with disabilities.

4 Oregon iPad Voting
5 Denver iPad Voting Pilot Project, April 30, 2012.
http://www.sos.state.co.us/pubs/newsRoom/pressReleases/2012/PR20120430iPadProject.html
In April 2012, it was announced that the Association of Election Officials of Bosnia and Herzegovina and the Central Election Commission had partnered with Everyone Counts to facilitate access to ballots for the estimated 50,000 voters with disabilities in the country. The initiative is supported by the U.S. Agency for International Development (USAID).

The World Health Organization estimates that 10% of the global population has some form of physical disability or visual impairment, with a higher incidence in post conflict countries. Under traditional voting systems, many persons with disabilities are forced to disclose their choices to whoever assists them in marking their ballot. Also, many polling locations are not physically accessible to voters with disabilities. The implementation of the Everyone Counts voting solution is designed to empower voters with disabilities in Bosnia and Herzegovina to participate in the electoral process and to cast their ballots in secrecy.

Zvjezdana Dragovic, Acting Executive Director, of the AEOBiH said, “The principle of free- and–fair democracy assumes that every eligible voter, regardless of physical capability, should be afforded an equal opportunity to cast his or her ballot independently and privately. We are delighted to be partnering with Everyone Counts to bring their global election and voting expertise and solutions to meet this essential human right.”

A number of non-governmental organizations are also being consulted to help best develop and implement the new voting system. This includes the Association of Paraplegics and persons with infantile paralysis of the Federation of BiH, the Association of Blind Persons of Sarajevo Canton, and the Coordination Board of the Organizations of Disabled People in the Republic of Srpska.

Following some initial voter focus groups, the Bosnia and Herzegovina government is implementing a simulated election in September 2012 designed by Everyone Counts to allow voters with disabilities to vote at the polls using commercially available technology, providing assistive solutions that are easy for people with impairments to use. What is learned from the simulated election will be used to refine the process, which will be used in the local elections in October 2012. This will lead to the definition of detailed recommendations for providing and improving voting access and participation by persons with disabilities in future elections in BiH, focusing on the 2014 parliamentary election.
The election and voting system includes the following accessibility components:

**VOTERS WITH VISUAL IMPAIRMENTS**

Screen reader technology is one of the most advanced forms of assistive technology to enable people with visual impairments to use their computers and web browsers. For the simulated election, the BiH and Everyone Counts’ solution incorporates a speech engine to voice the ballot for the voter in Bosnian, Serbian, or Croatian. The online ballot is engineered so that voters with visual impairments using the voice assistance need only to use two keys on the keyboard to navigate the ballot. This simply-to-use solution eliminates the necessity of the voter having to learn the intricacies of navigating the web using a screen reader, which is ideal for voters who are either newly blind or might not have access to a computer.

**VOTERS WITH MOTOR AND COGNITIVE IMPAIRMENTS**

Voting by traditional methods presents unique challenges to voters with motor and cognitive impairments. The solution developed for the BiH simulated elections is engineered so that voters who are unable to use a computer keyboard or mouse can navigate the ballot using switch access devices, without requiring the voter to have knowledge or prior use of the device. Usually when a person with a motor impairment uses a switch device to access a computer they have been trained in one of many advanced scanning methods allowing them to gain access to the entire web browser or program. The access devices deployed for this system provides processes that enable a voter to navigate and use a computer by simply sending one to three signals.

**ACCESSIBILITY DEVICES**

**PROCESSES THAT ENABLE A VOTER TO NAVIGATE AND USE A COMPUTER BY SIMPLY SENDING ONE TO THREE SIGNALS**

The solution is engineered so that a voter can vote the entire ballot using any one of the types of access devices provided at the polling place, or the voter can use their own personal device if they choose.

**SIP AND PUFF**

The system provides a Sip and Puff device for voters who do not have the use of their limbs. In order to navigate the ballot, the voter would sip to scroll through the ballot selections and puff to make their vote. Sanitary disposable mouthpieces are replaced after each use of the device.
ROCKER SWITCH

The system provides a two-sided Rocker Switch that can be operated with either the hands or feet. Similar to the Sip and Puff device, the left paddle is used to scroll while the right paddle is used to select.

THREE BUTTON SWITCH BOX

Everyone Counts has also developed a custom Three Button Switch Box for the Bosnian implementation that can also be operated using either the hands or feet. The third button allows for an additional input signal and has three large color coded buttons—green navigates forward, blue selects, and red navigates backward.

SPEECH READER

Unlike many DREs on the market right now, the online ballot solution developed for BiH by Everyone Counts allows a voter to have the ballot read to them using a speech engine while simultaneously using one of the access devices. As a voter uses the Sip and Puff, or the other switch devices, they can listen to their selection as they navigate. Additionally, a bright yellow visual indicator displays where in the ballot they’re currently located.

ACUPOINT HEAD POINTER

In addition to the switch devices, the AcuPoint Head Pointer provides a light graphite telescoping baton, which does not obstruct the voter’s view, to be used for making ballot selections. The voter can use the AcuPoint Head Pointer in conjunction with the Rocker Switch or Switch Box or with the computer keyboard if they choose.

TELEPHONE VOTING

In addition to using a computer, the solution also allows a voter to vote by using their telephone. The telephone keypad is perhaps the most universal tactile interface in the world, it provides a familiar and user-friendly input method for the newly blind. The telephone option announces clear instructions to the voter at the start of the ballot, allowing them to select the language of their choice. The telephone option has volume and speed control and enables the voter to make changes, and to hear a summary of their ballot choices before casting their completed ballot.

CONCLUSION

Persons with disabilities, arguably the most severely disenfranchised voters, can be provided secure, private, and independent access to their ballots, via new technology.

These solutions can be deployed securely and cost-effectively by any jurisdiction and anywhere in the world. Software-based solutions can provide improved ballot access, as well as privacy in casting a vote and the assurance it will be counted. The software solutions available can assist all individuals with disabilities to participate fully in the democratic process, including persons with visual, motor and cognitive impairments. Adopting next generation election administration and voting software can uniquely ensure that every citizen with a right to vote can do so privately and independently.
ABOUT
EVERYONE COUNTS

Everyone Counts, the world’s leading provider of state-of-the-art election administration and voting systems, uniquely combines world-class expertise in technology, computer security, usability, and election administration. Through this experience and expertise, Everyone Counts has modernized best election practices worldwide since 1997. Unique in the industry, Everyone Counts continually innovates to meet customer needs. Its patent pending innovations are quickly becoming the industry standard globally.

Breakthroughs in technology have transformed mission-critical industries throughout the world for decades. Everyone Counts’ unique combination of world-class expertise in technology and election administration has brought those state-of-the-art technologies to elections. Now greater accuracy, accessibility, reliability, security, and auditability can be delivered for each phase of election administration. And Everyone Counts’ unique Software as a Service delivery model results in sustainable, scalable, and significantly more cost-effective systems that perpetually delivers state-of-the-art services to your election administrators and your voters.

The days of single-vendor-dependency are over. The days of reliance on antiquated, purpose-built hardware are no more. Time-consuming manual, error-prone processes can be automated. The next generation of election administration and voting systems are here.
The United Nations Educational, Scientific and Cultural Organization in 2009 selected Everyone Counts Inc from dozens of worldwide applicants to partner with UNESCO in their “Empowering Persons with Disabilities through ICT’s” initiative.