

The Information Technology and Innovation Foundation  
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## Accessible Voting Technology Workshops

### Project Report

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## **Executive Summary**

Two, one and one-half day design workshops on accessible voting were held in early 2012 by the Center for Assistive Technology and Environmental Access (CATEA) at Georgia Tech. This project was sponsored as part of the Information Technology and Innovation Foundation (ITIF) Accessible Voting Technology Initiative (AVTI).

The workshops brought together a diverse group of stakeholders from 20 states to develop new concepts for making the voting experience more accessible to people with disabilities. The workshops focused on four aspects of the voting process: 1) preparing to vote, 2) voting in person, 3) marking the ballot, and 4) voting remotely. The goals for the workshop were to: 1) gather a broad view of accessibility needs; 2) look for opportunities for voting redesign and enhancements; and 3) find a common understanding about barriers and facilitators to voting for people with disabilities.

The workshops followed a small-group charrette structure that employed a number of creative and analytical brainstorming methods such as scenario based design, personas, and a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis. Integral to all of these methods was the grounding in the Principles of Universal Design. The workshop activities allowed participants to develop new concepts. Activities moved from identifying barriers, brainstorming solutions to overcome those barriers, selecting the best concepts to refine, assessing the accessible aspect of the selected concept and presenting the final outcome. After selecting the best concepts, each team used the Principles of Universal Design as a framework for validating the concepts. To help participants best achieve these goals, industrial design students helped visualize and showcase the teams' conversations by recording and diagramming ideas, keywords and concepts on paper, sticky notes, and boards.

By creating a collaborative design process, the workshops produced solutions that have the potential to make the entire voting process more accessible for every citizen. Ten new design concepts were produced in 3 days. The concepts were varied but all provided unique ideas and insights to advance the design of the next generation of accessible voting technologies.

## **Introduction**

This report describes the process and outcomes of two design workshops on accessible voting held in early 2012 by the Center for Assistive Technology and Environmental Access (CATEA), a multidisciplinary research center at Georgia Tech devoted to enhancing the lives of people with all levels of ability and functional limitations through the development and application of assistive and universally designed technologies. This project was sponsored as part of the Information Technology and Innovation Foundation (ITIF) Accessible Voting Technology Initiative (AVTI).

The workshops brought together a diverse group of stakeholders to discuss how the voting experience could be made more accessible to people with disabilities. These workshops focused on four aspects of the voting process: 1) preparing to vote (i.e., the design of pre-election and on-site information), 2) voting in person (including access to polling spaces), 3) marking the ballot, and 4) voting remotely (e.g., absentee ballot).

The goals for the workshop were to: 1) gather a broad view of accessibility needs and desires; 2) look for opportunities for voting technology redesign and enhancements; and 3) help stakeholder groups collaborate to find a common understanding about barriers and facilitators to voting for people with a variety of disabilities. Ideas and design concepts generated during the course of the workshops have and will continue to inform subsequent phases of the ITIF AVTI, including the recently completed online *OpenIDEO* competition, and will potentially be developed further in future sub-grants that will be awarded as part of the Initiative.

## **Workshop Participants**

Fifty-four invitees from 20 states plus the District of Columbia participated in one of two design workshops, which were held January 25-26 and February 22-23, 2012 at the Atlanta Loews Hotel (see Appendix A – Workshop Participants). These participants were selected to represent a broad spectrum of experiences and viewpoints related to the voting process. They included voting technology and security experts, election officials from 8 states (Arizona, California, Georgia, Illinois, Kansas, New Mexico, Oregon, and Texas); people with disabilities and accessibility advocates; and designers and researchers from technology, interaction, information, graphics, architecture, and other design fields. Because vision limitations pose such a significant barrier to accessing print or electronic information, 7 people who are blind or have low vision were included among the workshop participants. Other participants had mobility, dexterity, speech, or hearing impairments. Issues of people with cognitive impairments, seniors, and people for whom English is a second language were also represented. It should be noted that the categories of expertise were not mutually exclusive and a number of

participants represented more than one area of expertise. For example, there were 13 participants with disabilities that also had expertise in accessibility and design.

In addition to the invited participants, 6 researchers from the AVTI project acted as workshop facilitators. The facilitators were assisted by undergraduate and graduate industrial design students (8 in each workshop), who provided a visual record of workshop activities through graphic representation of the concepts being generated.

## **Workshop Structure**

The workshops were structured as 1.5-day design charrettes. A charrette consists of an intense period of collaborative design activities focused on envisioning solution to specific problems. One of the advantages of charrettes is that they serve as a way to quickly generate a design solution while integrating the aptitudes and interests of a diverse group of people. The workshops were comprised of multiple sessions in which all participants worked together or in small working groups.



**Figure 1: Small working groups with materials around them**

## **Composition of Working Groups**

Initially, participants were assigned to a particular working group of 6-8 people to ensure a balance and diversity of expertise and interests in each group. To ensure that our breakout groups would remember to consider the accessibility of their concepts, each breakout group included one or two people with disabilities. However, at various times during the workshop, participants from different stakeholder groups were given the opportunity to change working groups to enable them to engage in a topic in which they were most interested, so long as the number of participants in a group did not exceed 8.



**Figure 2: Recording and visualizing concepts**

## **Workshop Activities**

The four small groups consisted of structured brainstorming exercises each designed to generate and refine concepts around one the four aspects of the voting process:

- 1) preparing to vote (i.e., the design of pre-election and on-site information)
- 2) voting in person, including accessibility of polling spaces
- 3) marking the ballot
- 4) voting remotely

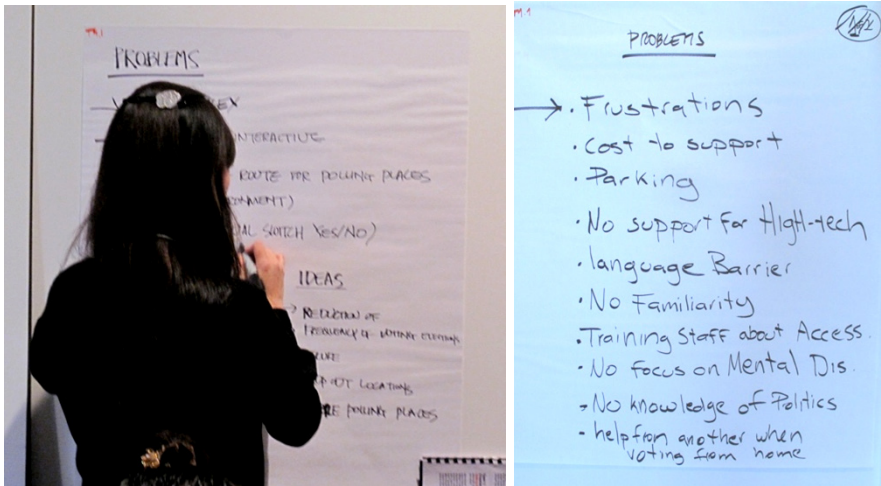
For each of the four topics, workshop activities moved from defining accessibility barriers to brainstorming solutions to overcome those barriers to selecting the top concepts to refining those concepts into viable solutions for accessibility and adherence to the Universal Design Principles. To enable workshop participants without prior design experience to more easily participate in the creative process, industrial design students were assigned to each team to help them visualize and showcase their conversations. Ideas were recorded; concepts were diagrammed or sketched (see Figure 2 and 3). At the end of each activity, the visual records were used by each group to present their concepts to the larger group. At the end of the workshop, each team created a final detailed design concept, which was presented as a final poster to the entire workshop.





**Figure 3: Teams worked to create posters to explain ideas in text and images**

All of the activities were guided by a workbook that was provided to all participants (see Appendix B) as well as the AVTI facilitators. At the end of day 1 the industrial design students created and printed a summary poster of the day’s activities documenting both process and product. At the end of day 2, a poster documenting the final design concept was presented. Based on the January workshop, the activities were modified slightly for the February workshop to provide more time for brainstorming and put less emphasis on design refinement. The activities for the February workshop are described below.



**Figure 4: Groups brainstormed problems in their assigned election topic**

**Identifying problems**

Participants started the workshop by dividing into breakout groups, introducing themselves, and presenting a problem with election accessibility (often from personal experience) that they were asked to think about prior to the workshop. The teams discussed the problems that had been presented and each working group identified a list of key barriers to the voting process for voters with disabilities.



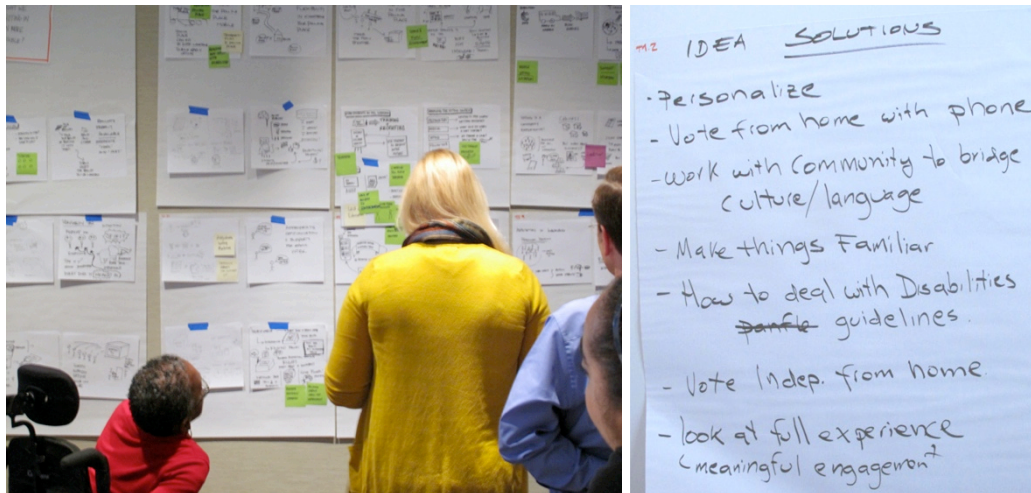


Figure 5: Solutions were presented as sketches (left) or broad concepts (right)

### Brainstorming solutions

Responding to the list of problems with the voting process, working groups were asked to brainstorm ideas to overcome those problems. Participants were encouraged to generate as many ideas as possible, from solidly practical ones to those that were wildly impractical. Wildly impractical ideas might seem out of place at first glance, but could spark more ideas. The working groups were also instructed to imagine design solutions without regard to policy, cost, technology, security or operational constraints, with the promise that those issues would be addressed later in the process. The groups used the seven rules of brainstorming developed by IDEO, which includes deferring judgment, encouraging wild ideas, building on the ideas of others, staying focused on the topic, having one conversation at a time, creating rich images and going for quantity. With emphasis on the last rule, teams were each tasked with creating 12 or more ideas.

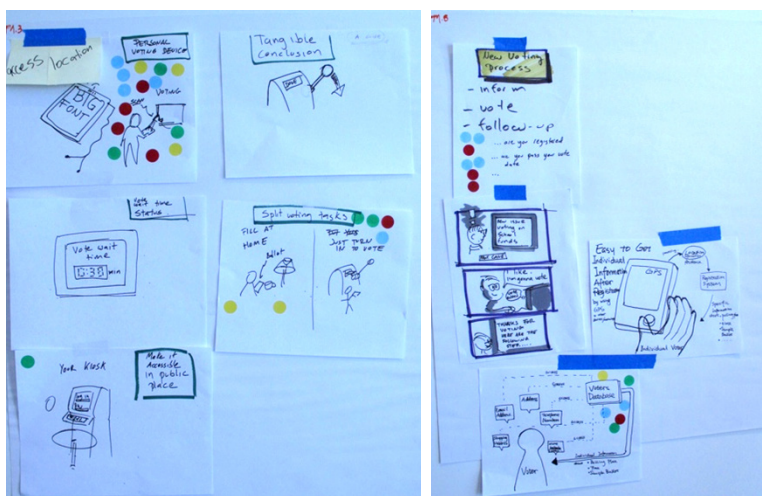


Figure 6: Sketches of ideas, showing process and format, posted for review by participants

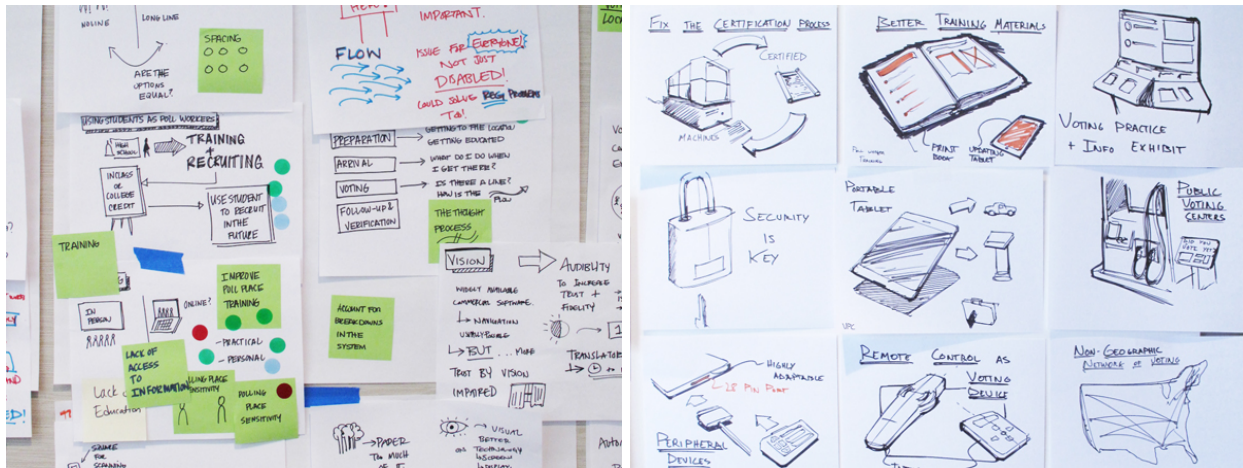
## **Narrowing focus**

After producing a large number of concepts in the initial brainstorming session, the focus shifted from quantity to quality. To narrow the focus of solutions and develop one or more concepts in more detail, each working group was instructed to review their ideas and group those that were similar. The groups were further divided into subgroups of 3-4 people, with each subgroup charged with developing one of the ideas. Subgroups were instructed to combine the ideas as appropriate and provide greater detail about the concept. To help them with this effort, they were encouraged to consider several questions, including:

- What are the effective current voting processes that I can build on?
- What would happen if I modify the process in some way?
- What are the issues of current voting technologies that I can improve?
- What can I substitute to make an improvement?
- What if I were to change the characteristics of a component to make it more accessible?
- What if I swap this for that and see what happens?
- How can I substitute the place or time?
- What part of the product or service could I change to make it more accessible? And in exchange for what?
- What happens if I warp or exaggerate a feature or component?

## **Selecting concepts**

To continue narrowing the number of solutions, participants were tasked to “vote” for the best ideas from each team. All of the concepts were displayed, giving participants and opportunity to review all of the ideas that were produced by each of the teams. As shown in Figures 6 and 6, each participant was given 12 “votes” using a color-coded sticker to represent a vote. The sticker color represented the participant background (e.g., blue for accessibility advocates, green for designers). Each participant could select up to three concepts in a working group, but no more than one sticker per concept. The voting process was used to guide each working group in selecting the best concepts for continued development.



**Figure 7: Concept sketches describing both process and voting system designs**

### **Refining concepts through the use of personas and scenario-based design**

Based on the voting process, each working group selected two of their concepts for further development. They were instructed to refine their concepts, using a series of personas to test the utility of their ideas. Personas are fabricated archetypes, or models, of end users that identify user motivations, expectations, and goals. Each persona is intended to be a singular icon that is representative of an entire group. Although personas are fictitious, they represent a composite prototype that represents the abilities and needs of a real group of users, in this case describing the characteristics of a potential voter. The workshop personas were based on preliminary ethnographic interviews with voters with disabilities as well as the expertise and experiences of project staff.

The personas included:

*“Tasha is a woman in her 30’s who runs her own business. She has been blind since birth. She employs a “reader” who reads print materials to her. However, she uses a computer independently and prefers that method for accessing information.”*

*“George is a retiree who has MS that affects his memory and his mobility. He uses a cane and can’t stand for long periods at a time. Because of his memory problems, he needs to bring notes with him to the polling station about how he is going to vote. He is very concerned about voting privacy — he misses the privacy of the old designs with the curtain.”*

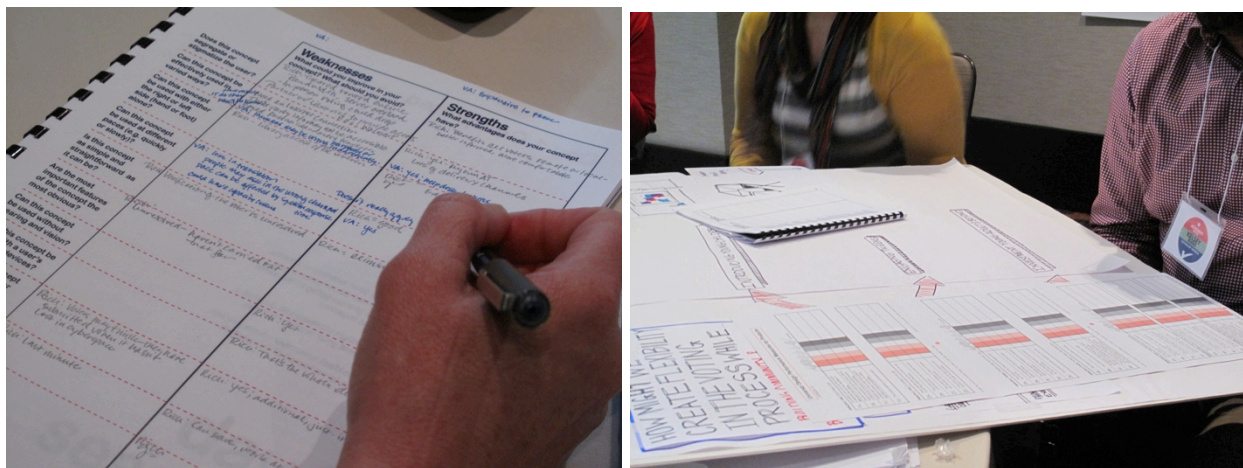
*“Angela has quadriplegia from a spinal cord injury. She can move her arms somewhat, but is not able to grip items or point. She uses a typing stick, held on to her hand with a splint, when she wants to hit keys on a computer keyboard. Angela uses a power wheelchair and has a service dog. Due to the height of her*

*chair, she frequently bumps her knees when she tries to pull up to work surfaces. She often feels rushed when voting.”*

*“Minjun (pronounced Min-Joon) has vision loss, including being color blind. As a recent immigrant to the U.S., English is Minjun’s second language. Although he can remember who the candidates are from seeing them on TV, he has problems reading their names.”*

*“Charlie has autism. He is high-functioning and is able to read well. However, he is uncomfortable in crowds and in unfamiliar situations, and he is sensitive to loud noises. He also tends to persevere when doing some tasks, and it is difficult to get him to move on to the next activity.”*

Each of the personas served as a reminder of the different types of people to keep in mind during a design process. Running through the same scenario using different personas helped to identify limitations in the design concepts that needed to be addressed. By the end of this activity, teams had refined their two concepts.



**Figure 8: The workbooks guided reviews of the concepts for strengths and weaknesses**

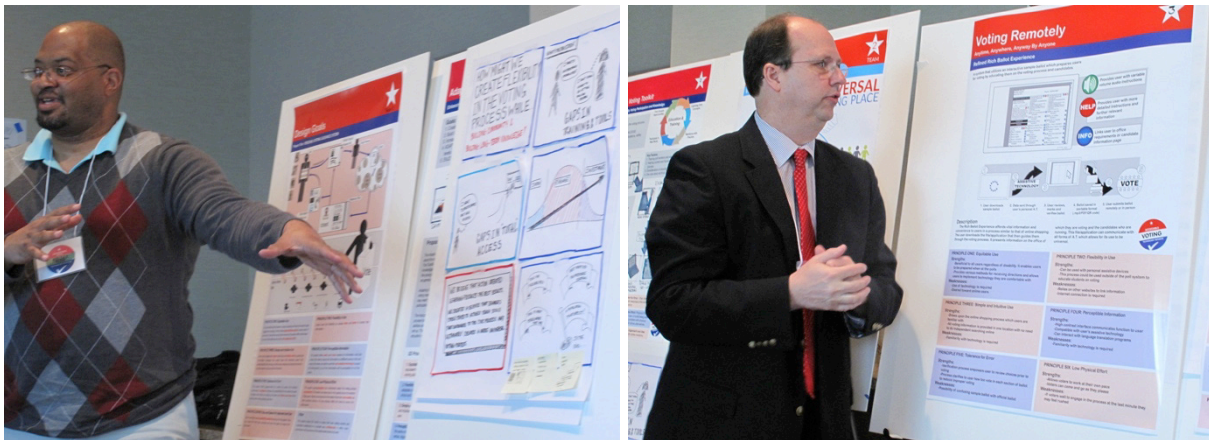
### **Validating concepts with the Principles of Universal Design**

In addition to personas, working groups used a SWOT analysis to identify the strengths and weaknesses based on the Principles of Universal Design (Figure 8). Universal Design (UD) is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. Seven principles of universal design developed at the Center for Universal Design at NC State are widely accepted for the evaluation of designs to meet the needs and abilities of all individuals. To identify the strengths and weaknesses of each concept, the UD principles were represented as a series of performance questions, including:

- *Does this concept segregate or stigmatize the user? (Principle 1: Equitable Use)*



- *Can this concept be used with either the right or left side (hand or foot) alone? (Principle 2: Flexibility in Use)*
- *Can this concept be used at different paces (e.g., quickly or slowly)?*
- *Is this concept as simple and straightforward as it can be? (Principle 3: Simple and Intuitive Use)*
- *Can this concept be used without hearing and vision? (Principle 4: Perceptible Information)*
- *Does this concept prevent people from committing errors? (Principle 5: Tolerance for Error)*
- *Can this product be used without causing fatigue? (Principle 6: Low Physical Effort)*
- *Can all important elements of the concept be reached from any position? (Principle 7: Size and Space for Approach and Use)*



**Figure 9: Presenting posters**

### **Presenting Day 1 process and concept**

At the end of Day 1, the industrial design students designed and printed a 2'x3' poster detailing the brainstorming process, including brainstorming, scenario-based design, SWOT analysis and universal design assessment, and the final product produced by that process. Each working group then presented (Figure 9) their poster to the entire group of workshop participants at the beginning of Day 2. In addition, rather than simply field questions or solicit comments from the larger group, each working group was tasked with developing 5 questions about their own concept. In this way, each group, which already knew the limitations and unanswered questions about their own concept, could seek feedback to address these specific issues from the larger group.



Figure 10: Refining concepts: Constraints, opportunities and threats (left); revised posters (right)

### Evaluating concepts in terms of implementation.

Each group was asked to categorize feedback from the presentation based on practical constraints (e.g., policies and practices). Combining these with other constraints (e.g., cost, operational issues, technological limitations, security) that were not considered in Day 1, each group developed a list of constraints that were relevant to their concept. Then, completing the SWOT analysis, opportunities (e.g., trends that they are aware of) and threats (e.g., obstacles) to implementation of their concepts were identified.

### Creating new alternatives.

Using the strengths and weaknesses identified in the previous activity, each group was asked to develop 4 new alternatives for their concept and to evaluate and refine the alternatives using a new set of personas as follows:

- *Maria is a retiree who has cerebral palsy that affects her mobility and her dexterity. She uses a scooter and has limited fine motor control. As a result, she has difficulty reaching and grasping objects and using interfaces with small buttons or controls.*
- *Michael is a retiree with a significant hearing loss. He uses hearing aids and can lip read if he is within a few feet of the speaker and the lighting is good.*
- *Amy is a single working mother who needs to pick up her 1 year old daughter at the daycare center before going to the poll to vote. The child is quite active and tends to wander off in public places. To make sure that her daughter does not wander off, Amy will have to hold her in her arms while she is voting.*
- *Tyler is a college student who has a condition that has resulted in blindness since he was a child, and more recently, mobility and fine motor issues that resemble arthritis. He can operate controls and buttons if they aren't too small or too stiff. At home, he uses a computer with speech capability.*

# In-Person Voting



## VOTING AT POLLING PLACES & VOTE CENTERS

### Sample Ballot & Information Transfer System



#### DESCRIPTION

Our design solution is a system to better prepare voters for going to a polling center, and create a more enjoyable voting experience. Ballots are available on paper or in digital form, they're filled out by the voter, then brought to the polling center. Eliminating polling times, discomfort, and anxiety—the polling machine scans the sample ballot and preselects your choices on-screen. You can confirm the selections and cast your vote. The machine itself is an accessibly designed polling machine equipped with a camera.

#### ADVANTAGES

- + Increased voting participation
- + Increased voter accuracy; more informed choices with less in-person anxiety
- + Increased device flexibility (iPad, phone, etc.)
- + Reduces paper cost with more targeted ballot printing
- + Modular interpretation of machines (adding printer & scanner to electronic voting machine)

#### 1. SCAN BALLOT

- + Camera digitizes and loads the voting machine with your choices

#### 2. CONFIRM ENTRIES

- + Browse your vote, and double-check your choices.

#### 3. CAST VOTE

- + Vote is cast electronically, with a paper copy printed for paper-trail purposes.

## 7 Principles of Universal Design

### 1 EQUITABLE USE

- + Sample technology is publically accessible
- + Voting machines are accessible

### 2 FLEXIBILITY IN USE

- + Facilitate more accurate choices
- + Access in comfort of home (while using assistive technologies)
- + Ability to confirm choices
- + Make ballot verification into reasonable partitions

### 3 SIMPLE & INTUITIVE USE

- + Need human verifiable code
- + Relies on using current best practices towards usability design.

### 4 PERCEPTIBLE INFORMATION

- + Internet access enables higher technology
- + Allows use of personal assistive technologies
- + Safe space

### 5 TOLERANCE FOR ERROR

- + Error handling in process
- + Multiple chances to examine answers

### 6 LOW PHYSICAL EFFORT

- + Major actions and thoughts can be made in comfort of home (with existing AT)
- + Minimize time spent in voting location

### 7 SIZE & SPACE FOR APPROACH AND USE

- + Majority of time and use can be spent in comfortable environments



Figure 11: Sample poster from workshop<sup>1</sup>

<sup>1</sup> Full text available online at <http://elections.itif.org/projects/design-workshops/concept-sample-ballot-information-transfer-system/>



## Presenting final concepts.

During lunch, the industrial design students documented the new alternatives in final posters for each group. To end the day, each group presented their work to the entire audience for final feedback (Figure 12).

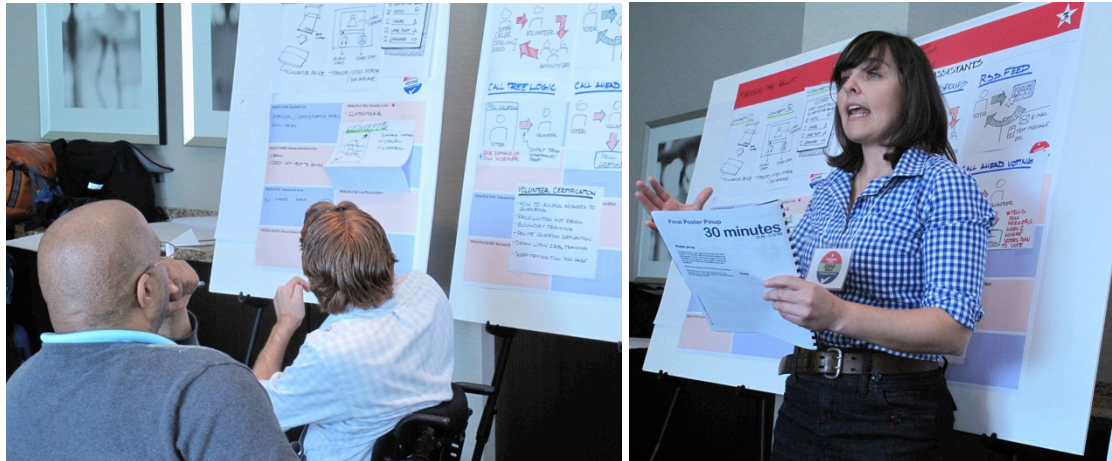


Figure 12: Presenting Final Concepts

## Workshop Concepts

The two workshops resulted in numerous ideas and ten more fully-developed concepts. These concepts are summarized below.

### Preparing for and learning about elections

- **A National Standardized Framework** – A best practices design for elections websites is used to make information consistent across election departments so that it is easier for everyone to use. The content includes the voter registration process, poll locations, election dates and hours.
- **Personal Voting Guidance System** – A personalized elections information system promotes effective voter participation at any point from the start of the campaign, to registering to vote, to filling out a sample ballot and casting a vote. Voters have the flexibility to choose when and where to access the information.
- **Adaptive Voting Toolkit** – This project enhances community voting participation and knowledge through education and training starting in grammar school. The students are taught about both elections and disabilities. High school students work as poll workers for their community service requirements.

## Communicating with the elections department

- **Express Voting Profiles** – Voters can maintain a profile with preferences for receiving election information. The profile can also store information about their accessibility needs.
- **Voter Assistants** – This project creates a rich support system by extending current social networking with certified volunteer providers of election help.

## Physical access to the polling place and ballot

- **The Universal Polling Place** – This pilot project would develop and test a polling place for a universal voting experience, while keeping it convenient and cost effective.

## Voting in-person, remotely, or a mix

- **Sample Ballot and Information Transfer System** – Voters receive a sample ballot, which they can mark in advance, either on paper or electronically. They bring the ballot to the polling place to cast it.
- **Rich Ballot Experience** – This system utilizes an interactive sample ballot which prepares users for voting by educating them on the voting process and candidates. The resulting ballot can be submitted remotely or in-person.

## Ballot design

- **Concept Analysis for an Improved Ballot Design** – Ballots are made easier for voters to understand by separating the contests by levels of government, providing richer information, and making the ballot navigation more linear.
- **Marking the Ballot: Separate Display from Data** – This concept focused on separating the front-end display from the back-end source for the ballot and the casting system. This approach maintains the integrity and security of ballot casting systems, while allowing the ballot to be made available via different modes (e.g., print, phone, home computer) and different accessible formats / languages.

## Further Development of Concepts

One of the most promising outcomes of the workshops was that participants continued to develop some of the concepts beyond the workshop period. The AVTI's OpenIDEO Challenge, a graduate class in the School of Industrial Design at Georgia Tech, which developed the EZ Ballot and development work at the Georgia Tech Research Institute based on the iPad as a voting platform.

AVTI's OpenIDEO design challenge was an online forum that challenged designers, engineers, election officials and disability advocates to answer the question: "How might we design an accessible election experience for everyone?" Ideas were presented, refined, and evaluated during a two month period that overlapped the workshops. A number of ideas that were introduced at the workshops were submitted to the OpenIDEO Challenge. Thus, the workshop provided a springboard for further development of concepts. Several workshop concepts ended up being included among the "Top 20" ideas from the challenge, including:

- Voter Help Hub (similar to Voter Assistants)
- Create a Support Community (similar to Voter Assistants)
- Community Voter Advocates (similar to Voter Assistants)
- Mark Anywhere (based on Sample Ballot and Information Transfer System)
- Online Balloting (similar to Sample Ballot and Information Transfer System)
- Design for Onboarding (based on Adaptive Voting Toolkit)

Finally, during the second phase of the AVTI project, subgrants will be awarded for projects that lead to the development of new accessible voting technologies and systems. This process will be monitored to assess whether concepts generated during the workshops are developed further under one or more of these grants.

## **Workshop Evaluation**

The participants were asked to fill out a short evaluation at the end of each workshop. The evaluations were open-ended, and asked participants about the overall workshop, the activities, and the materials. Responses were obtained from 78% of the participants.

The response to the workshop was overwhelmingly positive with all of the ratings above average on a 4-point Likert scale where 1 = Poor, 2= Average, 3= Good, and 4 = Excellent. All ( n = 41) but 1 respondent rated the workshop good or better with, 63.4% (n = 26) rating it "Excellent" , 12.2% (n = 5) rating it as "Good to Excellent", 22% (n = 9) and rating it as "Good". The lowest rating was "Average to Good (n = 1).

When asked in what ways the workshops were successful, or unsuccessful, the participants provided feedback such as the following:

- *Getting people out of their normal modes of thinking and communicating ideas about how to address challenges.*

- *It was successful because we brainstormed new ideas and were able to see everyone's viewpoints, needs and wants and are all walking away better informed.*
- *Great collaboration. Would have loved more time to interact with people from other teams.*
- *Occasionally lost focus on accessibility and got bogged down in other topics.*
- *What I enjoyed the most was the entire end-to-end design process -- concept to end product. This process is sorely missing in the accessibility community.*
- *[It was successful], because a number of solutions were proposed, not just criticisms.*
- *Ideas were vetted, but I don't see real solutions being obtained.*
- *Successful in beginning to explore ideas. [But,] I feel like a lot of our ideas are not necessarily new ones or are ones already in the works.*
- *Felt we generated actionable reform designs that will enhance access for most voters, not just those with disabilities.*

Similar to the overall workshop ratings, 95% indicated that the workshop was useful, with the one non-positive response simply indicating that it was too early to tell. Only 26% of the participants cited the development of new concepts as one of the reasons why the workshops were useful. Instead, the opportunity to hear the viewpoints of different stakeholder groups was most cited (53%) as a success, and 18% cited the contacts or “new allies” that they met. Three people (9%) felt that design workshop format might be something that could be useful in their work.

The inclusion of the design students received many positive comments in the evaluations. In addition to acting as note-takers, they made it possible for everyone to participate in sketching activities without penalizing participants without drawing skills. The value of the students, however, relied on their being prepared well, and able to keep up with the discussion.

- *Having the designers at the table sketching as brainstorming helped with visualization.*
- *The participants were allowed to discuss issues while the designers made our thoughts look impressive and cohesive.*

Based on feedback from the first workshop, changes were made to the activities and materials to improve the flow and help participants understand the instructions. This

resulted in an increase in the number of participants who felt that the activities helped them meet the goals of the workshop. Some of the comments included:

- *The iterative design process really allowed us to hone the original concept.*
- *The structure was very helpful in creating structure and focus w/o being too constraining.*
- *I think the collaboration was terrific.*
- *It was good to brainstorm and then come back to the real world at the end with the ideas brought into focus.*
- *I was very happy with the final concepts.*

However, the comments from both workshops underscore the challenge of creating an event that is valuable and productive for participants with such a wide range of backgrounds. Evaluation of the usefulness of the materials dropped from 95% to 76%, even as overall evaluations remained high. For example, changes to the workbook to make the activity instructions clearer after the first workshop, as requested by two January participants, resulted in a comment in February that they were too repetitive. There were mixed opinions about the usefulness of the pre-workshop assignment, and the application of the Universal Design Principles. In the process of making the activity instructions clearer after the first workshop (requested by two of the January participants), one February participant felt that they were too repetitive. Recommendations for future workshops included suggestions for how to improve the process:

- *Extending the meeting to two full days to enable an earlier end on the first day while also increasing the meeting length overall;*
- *Providing an introductory presentation to help get participants on the same page in terms of how elections are run;*
- *Having separate rooms for each breakout group to better handle noise and space,*
- *Providing more opportunities for participants to meet members of the other breakout groups, and*
- *Having more time working as a full group, rather than in breakout groups.*

## **Appendix A – Workshop Facilitators, Participants and Student Designers**

### **Workshop Facilitators**

- Daniel Castro, ITIF Accessible Voting Technology Initiative
- Karen Milchus, Georgia Tech
- Claudia Rébola, Georgia Tech
- Jon Sanford, Georgia Tech
- Whitney Quesenbery, ITIF Accessible Voting Technology Initiative

## **January Participants**

- Debbie Cook, University of Washington, Center on Technology and Disability Studies
- Nicholas Coudsy, Everyone Counts
- McDermot Coutts, Unisyn Voting Solutions
- Drew Davies, Oxide Design Co.
- Don DeFord, Oregon Secretary of State
- Katarina Echt, Emory University
- Nancy Frishberg, MSB Associates
- Thad Hall, University of Utah
- Christopher Hart, Institute of Human Centered Design / N.E. ADA
- Steve Jacobs, IDEAL Group, Inc. / Apps4Android, Inc.
- Mark Johnson, Shepherd Center
- Sharon Laskowski, NIST
- Jared Marcotte, New Organizing Institute
- Lester Marks, Lighthouse International
- Vincent Martin, Georgia Tech and Atlanta VA
- Greg McGrew, Assistive Technology Partners
- Lee Page, Paralyzed Veterans of America
- Jill Piner, Rice University
- Drew Tinney, Hart InterCivic
- Noel Runyan, Personal Data Systems
- Sharron Rush, Knowbility.org
- Alan Sherman, UMBC Cyber Defense Lab
- Kathryn Summers, University of Baltimore
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- David Becker, Pew Center on the States
- Steven Booth, National Federation of the Blind (NFB)
- Yvonne Cai, Dominion Voting Systems
- Jacquelyn Callanen, Bexar County Elections, Texas
- Dana Chisnell, UsabilityWorks
- Jim Dickson, American Association of People with Disabilities
- Jeremy Epstein, SRI International
- Christopher Fletcher, Election Systems and Software
- Jenny Greeve, Anthro-Tech
- Fran Harris, CATEA, Georgia Tech.
- Candice Hays, Democracy Live
- Kamanzi Kalisa, Georgia Secretary of State's Office
- Jonathan Knoll, InfinityPlusOne
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- Ben Lippincott, Shepherd Center - Wireless RERC
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- Tammy Patrick, Maricopa County Elections Department, Arizona
- Kelsey Ruger, ChaiONE
- Delores Scott, National Disability Rights Network
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## **Appendix B – Workshop Workbooks**

The workshop workbooks are available on the ITIF AVTI website at <http://elections.itif.org> as either a [PDF file](#) or a [text-only Word document](#).