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ExpressVote Usability Report
ExpressVote 5.2.0.0

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A usability test of ExpressVote version 1.0 was conducted during February and March of 2014 at Clemson University. The purpose of this test was to fulfill requirements for EAC certification based on the Voluntary Voting Systems Guidelines (VVSG Version 1.0).

CLEMSON HUMAN-CENTERED COMPUTING

ELECTION Systems & Software

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I. Executive Summary

The Human Centered Computing Lab (HCCL) conducted a usability test of the ExpressVote version 1.0 during the months of February and March 2014 at Clemson University. The purpose of this test was to fulfill requirements for EAC Certification in compliance with the 2005 Voluntary Voting System Guidelines (VVSG version 1.0).

During the usability test, 68 voters from the general population used the ExpressVote in a simulated election. The election consisted of 1 test ballot with 11 contests, including:

- Federal, state and local contests

- Partisan and nonpartisan contests
- Single member and multimember contests
- Retention contests
- Constitutional amendments
- Referenda and ballot initiatives

The test ballot developed by ES&S and approved by the HCCL was used to simulate the tasks that users will be asked to perform during the usability tests.
This ballot includes tasks that model typical ballots from around the country, including:

- Voting for names at various locations within a list of names
- Voting a partial slate in a multimember contest
- Skipping elements of a ballot
- Write-in votes

During the usability test, participants worked alone and were only provided assistance or help by the test administrators as requested. Following the conclusion of the testing, the results were analyzed to determine participants' effectiveness, efficiency and satisfaction using the ExpressVote.

Based on data collected and analyzed, the following summary results indicate that the ExpressVote usability is better than average, performs accurately, and is well received by voters:

- 100% of ballots were successfully submitted/completed
- 92.14% of the requested tasks were completed without any issues
- 118 assists were provided, the majority related to voter understanding of the task instructions
- 5.8 minutes was the average time to complete the voting session
- A Likert Scale rating of 3.9 out of 5 indicated confidence by voters that they had used the system correctly
- A System Usability Score (SUS) of 72.09 indicated that voter satisfaction with the system is above average
- The Holistic Usability Measure (HUM) further indicates that the ExpressVote provides above average usability for the majority of participant groups.

II. Introduction

The primary purpose of this study was to examine the usability of the ExpressVote EVS5200 voting machine. The EVS5200 voting system includes a touch-screen display, an audio-tactile interface, and an integrated card reader and printer. The audio-tactile interface includes three assistive technologies-- two position switches and a keypad. The ExpressVote system was designed to accommodate voters in the general voting population, including voters with cognitive, dexterity, auditory, and visual impairments. For this study, participants in each of those populations tested either the visual/touchscreen or the audio-tactile modality and observational data were collected to compute effectiveness, efficiency, and voter satisfaction in the human-voting system interaction.

III. Planning the Study

Timeline

The study was conducted over a period of 5 months (See Figure 1). Five to six usability researchers met to discuss usability requirement material provided by ES&S, draft a study protocol and data collection forms, and complete required documents for Institutional Review Board (IRB) submission. After obtaining IRB approval, the research team spent about 3 months recruiting participants, conducting a pilot study, amending the original IRB documents, conducting the usability tests, collecting data, analyzing the data, and drafting the usability report.

Figure 1. Study Timeline

	November	December	January	February	March
ExpressVote Training					
Study Design/Planning					
Institutional Review Board					
Recruitment					

Pilot					
Amendment to Original Study Design					
Conduct Testing					
Drafting Report					

Research Team

The research team consisted of 5 people (3 mid to senior level Ph.D. students and 2 postdoctoral researchers). The research team underwent a one-day training session provided by the machine vendors. The session included a presentation on the machine, a demonstration, and a hands-on training session. The training included instructions on voting, using the voting machine's accessories, and troubleshooting technical issues. In addition to the aforementioned training provided by the vendor, the research team conducted its own informal training on the machines' setup and use before the pilot study.

Usability Protocol Design

The protocol was designed to allow the usability team to primarily collect quantitative data on participants' interactions with the system's visual/touchscreen and audio-tactile interaction modalities, their subjective ratings of satisfaction and confidence in using the system, and other qualitative observational data. The usability testing protocol was developed using guidance from information provided by the National Institute for Standards and Technology (NIST) and the vendor. The researchers met to develop the initial set of testing materials including a demographic survey, pre-testing survey, voting instructions, visual and audio voting tasks, and post-questionnaire. Observational coding sheets were also developed to aid in the collection of observational data during the study. All materials, in addition to an informed consent form and recruitment materials were submitted to the Clemson University Institutional Review Board (IRB) for approval.

While awaiting IRB approval, a review meeting was conducted with a larger team of Human-Computer Interaction researchers to identify any additional elements that could improve the study. From that meeting, several tasks were added to the audio and visual instructions task list. In addition to the review, a pilot was conducted with the larger

research team to refine the protocol and study materials. Nine participants from the researchers' lab participated in the pilot study. From this pilot, several changes were made to the data collection materials and updates were made to the protocol. The protocol and all study materials were then submitted to the IRB for an amendment to the previously approved application. Approval for the IRB amendment was obtained before beginning the study with participants.

IV. Methods

Recruitment and Participants

Recruitment was conducted by word-of-mouth or by email through local organizations in the local community. Seventy-one participants were recruited, however 3 participants were excluded due to incomplete or inconsistent data. Therefore, the final report includes data analysis for 68 participants. Approximately 48.5 % (n=33) of the participants were 30-64 years old, 79.4% (n=54) were Caucasian, and 66.2% (n=45) had a Graduate Degree (See Tables 1 - 3).

Table 1. Participants' Age Ranges

Age	Number of Participants	Percent
Under 18	0	0.0%
18 to 29	6	8.8%
30 to 64	33	48.5%
65 and older	29	42.6%

Table 2. Participants' Races

Race	Number of Participants	Percent
African American	12	17.6%
Caucasian	54	79.4%
Hispanic	0	0.0%
Asian	1	1.5%
American Indian	0	0.0%

Others	1	1.5%

Table 3. Participants' Education Levels

Education	Number of Participants	Percent
Did not Finish High School	2	2.9%
High School	0	0.0%
Some College	9	13.2%
College Degree	12	17.6%
Graduate Degree	45	66.2%

Participants were recruited from the general voting population; however, participants were purposefully recruited from the following groups: blind, low-vision, and dexterity. Five of the participants recruited identified as having vision impairments and 3 participants identified as having dexterity impairments. In addition, 5 participants identified as having cognitive impairments and 6 identified as having hearing impairments.

Environment and Equipment

The usability tests were held in rooms suitable for a voting activity. Conference rooms at each of the three locations were rearranged to fit this purpose. Each conference room included a large table with chairs that were used to administer the pre and post-test. Research team members rearranged the furniture in the room to provide easy unobstructed access to the voting stations. Voting stations were arranged along the wall of each room to remove any screen glare from external or internal lights and to provide ease accessibility for persons with disabilities.

One or two ExpressVote EVS5200 voting machines were set up in the voting locations. One machine sat on a table and the other inside a voting booth stand--both supporting structures were provided by the manufacturers. The supporting structures were not variables observed in the study. The table was designed to accommodate voters in wheelchairs or similar ambulatory devices. The table was used in all three studies; the booth was only used in two. Since the voting machine that sat on the table was designed for those in wheelchairs, a chair was set up near the machine so that voters without a wheelchair could still use the same machine.

Each voting machine included assistive peripherals included by the manufacturer, including a keypad, a two-position switch, and a set of headphones. The keypad remained connected to the machine throughout the testing, however the headphones and two-position switch were only connected for those who requested/needed them.

Experiment

Upon arrival each participant was greeted and provided with an informed consent form. The informed consent form explained the purpose of the study, risks, benefits, and that the study was voluntary and could be ended at any time. If the participant agreed to continue, he/she was provided with a demographic questionnaire. The demographic questionnaire included questions about the participant's personal characteristics (e.g. age, gender, race), disabilities, and familiarity with voting technologies (See Appendix – Pre-Questionnaire). After completing the demographic survey, the participant was then escorted to the voting machines. The participant was then provided with voting instructions and a set of audio or visual voting tasks, depending on what voting modality the participant requested. The participant was provided with time to read the voting instructions and voting tasks and ask questions. In the case where the participant was blind, instructions were read to him/her. Low-vision participants had a choice of reading the instructions alone or having someone read them. An observer then provided additional instructions and reminded the participants to follow the instructions on the voting tasks list in the order they appeared. In the case of blind participants, tasks from the audio task list were read to the participant by one of the observers. An observer then provided the participant with a ballot card and asked the participant to begin when ready.

During the testing, two researchers acting as observers timed the participant's interactions with the voting machine. Timing began when the participant entered his or her ballot card and ended once the participant printed the card or cancelled the voting session. The observers also noted any assists (task, technical, or instructional) given to the participant during the testing session and any error that were made (See Appendix – Observational Coding Sheet). Errors were marked when participant selections did not match instructions provided on the voting instruction list. At the end of the testing session, the participant was led to another researcher to complete a post-test questionnaire. The two observers compared observation notes and prepared for the next participant.

At the end of the testing session, the participant was asked to complete a post-test that collected data on their experiences and satisfaction with the voting machine (See Appendix – Post-Test). The questionnaire included 16 statements. For each statement, the participant

was asked to rate their agreement with a 5-point Likert scale (1 strongly-disagree to 5 strongly-agree) rating. Afterward, the participant was thanked and provided with a $50 gift card for their participation in the study.

V. Usability Test Results

The voting machine was evaluated for effectiveness, efficiency, and voter satisfaction. A total of 1 participant chose to use the audio interface and 67 used the visual interface. Self-reported participant data and observational data from the usability team was collected and analyzed. After the study, observational data collected by each of the two observers was compared for validity and discrepancy removal. In addition, descriptive statistics (e.g. averages, frequency) were performed on quantitative data.

Effectiveness

Four metrics were used to measure effectiveness including a task completion score, the percentage of tasks completed without errors, the number of assists provided, and a perfect ballot index.

Number of Ballots Cast Successfully

All participants were able to cast their ballots successfully. A ballot was considered successfully cast when the voter completed the voting task and cast their voting card. In the case of this study, a successfully cast ballot was one that was printed. The voter completion rate was 68/68 or 100%. The voter completion rate is the percentage of test participants who were able to complete the voting and balloting casting tasks.

Perfect Ballot Index & Percent of Tasks Completed

The perfect ballot index is the ratio of the number of cast ballots containing no erroneous votes to the number of cast ballots containing one or more erroneous votes. Erroneous votes included voting for the wrong candidate or voting for the wrong number of candidates. The perfect Ballot Index for this study was 37:31. Thirty-seven ballots were cast with no erroneous votes and 31 of the ballots cast contained one or more erroneous votes.

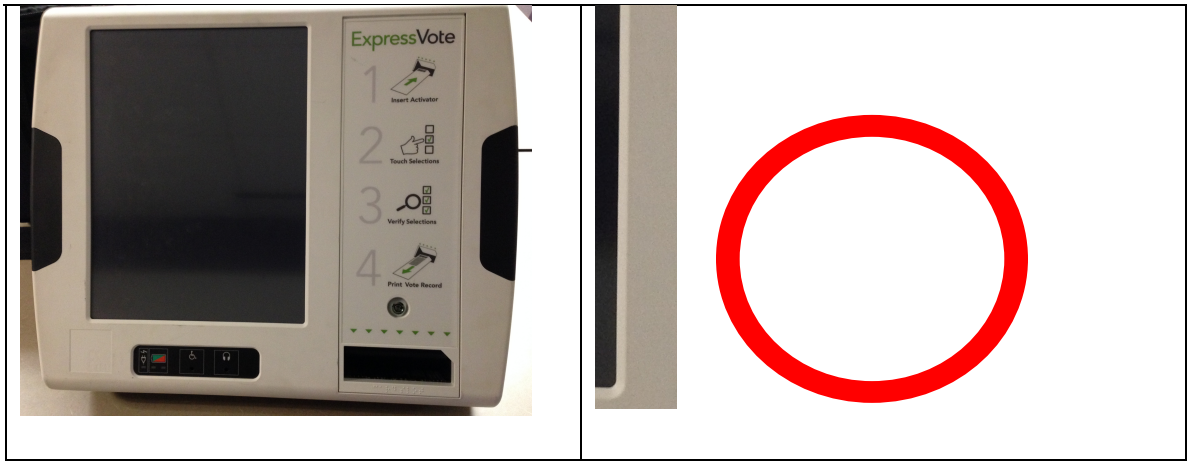
Observation data revealed that participants voted erroneously a total of 75 times (See Table 4). Twelve participants had trouble inserting the voting card correctly. When tasked to verify their voting selections and make a change to the ballot from the verification screen, twenty-seven participants failed to do so or had trouble

completing this task. Seven participants did not write-in a candidate when instructed to do so and twenty-four participants voted for an additional candidate when instructed to vote for only two candidates. Finally, five participants were unable to print their voting card without assistance. The five that needed assistance attempted to print the voting card by selecting the icon on the ExpressVote instruction panel (See Figure 1). In total, 68 participants completed 954 tasks. Therefore, 92.14% of the tasks were completed correctly. Our summary observation is that in general the vast majority of erroneous task voting was attributable to voter confusion or misunderstanding of the voting instructions provided and was not a result of usability issues on the ExpressVote.

Table 4.Task Deviations

Type	Number
Inserted card incorrectly	**12**
Did not follow instructions correctly to verify their voting selection and make changes to ballot	**27**
Did not complete write-in task as instructed	**7**
Voted for the wrong number of candidates as specified in the voting instructions	**24**
Selected print icon on instruction panel (See Figure 1)	**5**

Figure 1. ExpressVote Instruction Panel



Number of Assists Provided

A total of 118 assists were provided to participants during the voting task (See Table 5). Three types of assists were recorded: instructional, task, and technical. Instructional assists were provided for clarification on the test or task instructions. Task assists were provided to help voters complete a task on the voting task list. Technical assists were provided to help voters recover from a system error or bug. Table 6 provides the average technical, instructional, and task assist per participant in each respective group.

Efficiency

Efficiency was measured as the average voting session time or mean time taken per voter to complete the process of activating, filling out, and casting the ballot. The average session time was 5.8 minutes amongst all participants. For each group, Table 7 provides the average voting session times.

Table 5. Count of Assists Provided

Type of Assist	Number
Instructional Assists	83
Task Assists	35
Technical Assists	0

Table 6. Average Assist per Participant Group

	Technical Assist	Instructional Assist	Task Assist
Blind/Low Vision	0	6.2	1
Deaf/Hearing	0	0.17	0.16
Dexterity/ Motoric	0	1.33	1.33
Cognitive	0	0.6	0
General	0	0.71	0.27

Table 7. Average time to complete the voting session in minutes

Voter Type	Average session time
Blind/Low Vision	9
Deaf/Hearing	4.82
Dexterity/ Motoric	6.34
Cognitive	7.97
General	5.11

Voter Satisfaction

The System Usability Scale (SUS) was used to measure voter satisfaction. The system usability scale is a well-known and validated metric for evaluating the usability of a system. SUS includes 10 questions, five of those questions are positive and five are negative. The participant rated each question on a scale of 1-5 (Strongly Disagree - Strongly Agree). A SUS score is calculated and the score can be interpreted using a grading scale of A-F where A is perfect usability and F is terrible usability. The average SUS score ranges between >=60 and <=69. The SUS average score amongst all participants for ExpressVote was **72.09**. Table 7 provides the mean SUS score for each categorized group of participants.

Voter Confidence

As part of the Post Questionnaire, a question regarding voter confidence was included. The participants provided their level of confidence for using ExpressVote based on a 5-point Likert Scale (*1=Strongly Disagree* AND *5=Strongly Agree*). Table 8 provides the mean score from the Likert Scale for each categorized group of participants.

Table 8: Voter Satisfaction Ratings

Voter Type	Mean SUS Score
Blind/Low Vision	68.50
Deaf/Hearing	70.42
Dexterity/Motoric	65.00
Cognitive	62.50
General	73.88

Table 9. Voter Confidence - Mean Score (using a 5-point Likert Scale)

Voter Type	Mean Score
Blind/Low Vision	3.4
Deaf/Hearing	4.0
Dexterity/Motoric	3.3
Cognitive	3.2
General	3.8

HUM

The Holistic Usability Measure (HUM) evaluates the usability of a system based on different metrics that are defined by the designer. For this study, 9 metrics were used and the usability team assigned weights to each metric according to their understanding of the importance of each metric in the voting process (See Table 10). For example, since the goal of an election is for a voter to successfully cast a ballot, completion rate was given a higher weight followed by ballot error rate and efficiency. In other words, this particular assignment of weight values prioritizes successful ballot casting, error-free ballot completion, and efficient ballot marking by assigning higher HUM weight values to completion rate, ballot error rate, and efficiency or completion time. All other metrics (e.g. satisfaction, confidence, assists, etc.) were given an equal distribution of weight values in the HUM calculation.

Table 10: HUM Scores and Weights

Metric	Weight	Blind/Low Vision	Deaf/Hearing	Dexterity/ Motoric	Cognitive	General
SUS Satisfaction	0.04	0.75	1	0.75	0.75	1
SUS Confidence	0.04	0.75	1	0.75	0.75	1
Efficiency	0.21	0	0.5	0.25	0.25	0.5
Effectiveness (Completion Rate)	0.3	1	1	1	1	1
Effectiveness (Ballot Error Rate)	0.25	0.75	0.75	0.75	0.75	0.75
Effectiveness (Task Error Rate)	0.04	0.75	0.75	0.5	0.75	1
Effectiveness (Task Assists)	0.04	0.75	1	0.75	1	1
Effectiveness (Instructional Assists)	0.04	1	1	1	1	1
Effectiveness (Technical Assists)	0.04	1	1	1	1	1
HUM score		0.6875	0.8225	0.73	0.75	0.8325

The HUM metrics for the different groups of participants show that ExpressVote was more usable among the General Population (83.25%) followed by the Deaf/Hearing (82.25%) and Cognitive (75%). The HUM score is calculated as follows:

HUM = W1*Metric1 + W2*Metric2 + … + Wn*Metric n
where W1 + W2 + … + Wn = 1
and 0 ≤ W1, W2, …, Wn ≤ 1

For this study, the HUM score was calculated by multiplying each metric with the weight defined by the usability team. For example, for the Blind/Low Vision HUM was calculated as follows: HUM = 0.3(1) + 0.25(0.75)+…+0.4(1).

Observational Notes

In addition to the above metrics, observers also collected notes during the study pertaining to issues participants encountered with the system. These notes are provided below:

- When asked to print the ballot (see Figure 1), five participants attempted to select the print icon provided to the right of the panel (the voting instruction panel) of the ExpressVote machine.

- Some participants had trouble inserting the card into the machine. This was particularly a challenge for the voters with visual or dexterity impairments.
- Participants were most confused with what to do when alerted that they had not fully voted one of the contests. Participants were most confused with the voter instruction advisory such as the undervote alert. For example, they were confused with what to do when alerted that they had not fully voted one of the contests and this may have increased the number of erroneous votes and the amount of time taken to vote.

VI. Discussion

It is important to note that based on observations of the usability team, two factors may have played a role in some of the outcomes outlined in the results section. On both the audio and visual task lists, the first task was placed out of order on purpose as to evaluate whether or not a person wishing to only vote for a certain candidate could easily navigate through the ballot interface. Despite being asked to vote based on the order and instructions that appeared on the task list, nearly every participant skipped this step. In addition, because the task was not in order as the other tasks in the list, it was observed that some participants did not pay close attention to the instructions and therefore voted for the wrong candidate for the rest of the study.

Second, one task was included to evaluate the voter instruction advisory provided by ExpressVote. It was observed that oftentimes, because the instructions on the ballot (vote for 3 candidates) were not consistent with the instructions on the task list (vote for 2 candidates), participants would either ask for clarification resulting in an instructional assist or simply vote for 3 candidates which resulted in a deviation from the task.

In addition, for the Blind/Low Vision and Cognitive participant groups, researchers read the voting task list to the participants. This may have increased the number of instructional assists for these groups. Similarly, because the tasks were read to the participants, it may have also impacted the number of task deviations and the overall task completion time.

Our conclusion is that the voting assists and task deviations identified above may have been related to voters not understanding and correctly following the written test instructions.

Summary

Overall, all participants (n = 68) were able to cast their ballot successfully. Approximately, 92.14% of the voting tasks were completed without error. Of the 118 assists provided, 83 (67.47%) were instructional or to clarify instructions provided on the voting task list. On average, Blind/Low Vision voters received the most instructional assists (mean = 6.2). Thirty-seven ballots were cast with no errors and 31 of the ballots cast contained one or more errors. The highest average session time was among the Blind/Low-Vision group (mean = 9) and lowest among the Deaf/Hearing (mean = 4.82). The system usability score for the ExpressVote system was 72.09 which indicates a higher than average level of user satisfaction among participants. The lowest mean SUS score (mean = 62.50) was among the Cognitive participants. Most voters were neutral or confident they could use the system in a real election. Finally, the HUM metrics for the different groups of participants show that that ExpressVote was more usable among the General Population (83.25%) followed by the Deaf/Hearing (82.25%) and Cognitive (75%). Overall, these results suggest that the ExpressVote is a usable and accessible voting technology.

VII. Appendix

Informed Consent Form

RESEARCH DESCRIPTION for Usability Benchmarks for Voting Systems

PRINCIPAL INVESTIGATOR: Dr. Sharon Laskowski, 301-975-4535

The National Institute of Standards and Technology (NIST) is developing guidelines for the usability of voting systems under the directives in the Help America Vote Act (HAVA). This study is being performed to determine how easy or difficult it is for voters to use voting machines. Usability will be measured by determining the time it takes a voter to vote, the number of errors when the vote is cast, and voter satisfaction. The results of this study will be used to develop usability test methods and benchmarks for voting machines. The research is funded by the Election Assistance Commission (EAC) and NIST and conducted by User-Centered Design, Inc. and NIST.

We collected your demographic data at the time your appointment was set up. This includes age, gender, education level, race, location, reading ability, experiences related to voting, and any disabilities. We will use this data in our analysis. For this study, you will be given written or audio instructions on how you as a voter "want to vote" in a mock election. You will be asked to vote as instructed on a specific voting machine. In addition to collecting your votes, there may be a camera focused on the machine and your hands, but your face will not be photographed. After you cast your ballot, you will be asked for your opinion about the voting machine. This process should take you no more than 30-60 minutes.

CONFIDENTIALITY: All of your voting time and error data, demographic data, and voter experience and satisfaction/confidence data will be recorded without identifiers. When you were recruited, we were given your name and demographic data. If you agree to participate in this study, we will assign you a number. Your data will only be identified and linked together by a number, and will not be linked back to your name or other identifier in any way. We will not use your name in any of the data or the reporting. The original list containing your name will be destroyed after the testing is completed.
Your identity will be protected to the extent permitted by law, including the Freedom of Information Act. Members of the NIST Institutional Review Board (IRB), appropriate NIST researchers and contractors, EAC members and staff, and other appropriate Federal employees may review the records of this study. The data will be used by NIST researchers to create usability performance benchmarks and test methods for voting machines.

You are free to withdraw from the study at any time during the experiment. In total, we expect to have approximately 1000 subjects complete the experiment.

[Continue on other side]

There are no risks involved in participating in this study, nor are there any immediate benefits to you as a subject. The long-term benefits of this study should be improved voting systems.
COMPENSATION: You will be paid $50 in cash for your participation in this study before you leave.

CONTACT INFORMATION: For questions regarding this study, please contact Dr. Sharon Laskowski at (301) 975-4535, sharon.laskowski@nist.gov. For questions regarding your rights as a human subject, please contact Lisa Karam, Acting NIST IRB Chairperson, at (301) 975-5561 or (301) 975-3190 or lisa.karam@nist.gov.

"I have read the above description of this research project. I have also spoken to the project researcher, who answered any questions I had about this project. I acknowledge that I have received a personal copy of this form. I agree to participate in this research and I understand that I may withdraw at any time."

Signature: _____ Date: _____

Project researcher name: _____

Project researcher signature: _____ Date: _____

Observational Coding Sheet

Participant # _____ Video ____ Audio ____ (Check one)

Session Start Time _____ Session End Time _____

Task #	Error(s)	No Assist	Instructional Assist	Task Assist	Technical Assist
Task 1					
Task 2					
Task 3					
Task 4					
Task 5					
Task 6					
Task 7					
Task 8					
Task 9					
Task 10					
Task 11					
Task 12					
Task 13					

Voting Successfully Completed
Was the voter able to complete the process of voting and casting their ballot (i.e. print ballot)?
Yes No

Notes:
What is an Error?
Was the voter able to complete each task without error?

- Example(s) of an Error
  - The voter selected the wrong candidate.
  - The voter was unable to write-in a candidate.

What is an Assist?
How many times did the voter request or require assistance from a research team member? What type of assistance was requested?

- Technical Assist – help voter recover from a system error or bug
- Instructional Assist – provide clarification on the test or task instructions
- Task Assist – help voter complete a task

Voter Instructions

In our mock election, we will be using fictitious names for candidates. Colors will designate the political parties. Any similarity between names of candidates and real people is purely coincidental. For example, you might see or hear this:

GEORGE BENDER / PURPLE

Or

DIANNE HILSWORTH / SILVER

Please attempt to vote as described and follow the instructions that are available. There are written and audio voting instructions available on the ExpressVote that will help you understand how to vote. You will move through the ballot from contest to contest until you get to the end. There will then be a summary of your selections so you can verify your choices. When you are satisfied that you have voted correctly, you may print the card with your vote selections and cast your votes. If you don't wish to cast your votes, then you may choose to have the card returned to you.

Once you start, the assistance we can give you is limited.

Please do the best you can. If you are stuck and cannot continue, inform one of your researchers.

Now, follow the instructions to begin voting.

Thank you.

Visual Voting Instructions

Please vote exactly as described on this page.

1. *Insert the card to activate the ballot and begin voting*

2. Vote for STATE SENATOR DISTRICT 36

3. For PRESIDENT/ VICE-PRESIDENT, vote for candidate:
   GEORGE BENDER

4. For GOVERNOR, vote for a Write-In candidate by entering:
   BOB SIMMS

5. For UNITED STATES SENATOR, vote for candidate:
   DIANNE HILLSWORTH

6. Vote for a candidate for UNITED STATES REPRESENTATIVE DISTRICT 49

7. Vote for a candidate for the MEMBER OF STATE ASSEMBLY DISTRICT 66

8. Vote for two candidates for City Council- Lemon Grove

9. Vote for Retention of Judges – Moreno - **YES**

10. Vote for Retention of Judges – Baxter - **YES**

11. For CONSTITUIONAL AMENDMENT D:
    DO NOT VOTE

12. For BALLOT MEASURE 106, vote for:
    NO

13. On the Summary Page, Change Vote for Retention of Judges – Moreno to **NO**

14. Verify your selections from the summary page

Print your card

Audio Voting Instructions

Please vote based on my instructions.

1. To begin, put on the headphones and follow the instructions to insert the card.

2. Adjust the Speed or Volume of the audio

3. Vote for STATE SENATOR DISTRICT 36

4. For PRESIDENT/ VICE-PRESIDENT, vote for candidate:
   GEORGE BENDER

5. For GOVERNOR, vote for a Write-In candidate by entering:
   BOB SIMMS

6. For UNITED STATES SENATOR, vote for candidate:
   DIANNE HILLSWORTH

7. Vote for a candidate for UNITED STATES REPRESENTATIVE DISTRICT 49

8. Vote for a candidate for the MEMBER OF STATE ASSEMBLY DISTRICT 66

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12. For CONSTITUIONAL AMENDMENT D:
    DO NOT VOTE

13. For BALLOT MEASURE 106, vote for:
    NO

14. On the Summary Page, Change Vote for Retention of Judges – Moreno to **NO**

15. Verify your selections from the summary page

Print your card

Pre-Questionnaire

1. Are you a United States citizen?
   - ☐ Yes
   - ☐ No

2. Have you ever participated in a usability test of a voting system before?
   - ☐ Yes
   - ☐ No

3. What is your education?
   - ☐ Did not finish High School
   - ☐ High School
   - ☐ Some College
   - ☐ College Degree
   - ☐ Graduate Degree

4. What is your Race or Ethnicity?
   - ☐ African American
   - ☐ Caucasian
   - ☐ Hispanic
   - ☐ Asian
   - ☐ American Indian

5. Do you consider yourself fluent in the English language?
   - ☐ Yes
   - ☐ No

   Are you eligible to vote in the United States?
   - ☐ Yes
   - ☐ No

6. Do you or anyone in your household or immediate family work in any of the following situations:
   - ☐ Information technology or software development
   - ☐ Usability or market research
   - ☐ Poll worker
   - ☐ Work for or have a financial interest in a voting machine manufacturing, development, marketing, evaluation or sales business or organization
   - ☐ Any other position that is part of the voting process

7. What is your gender?
   - ☐ Male
   - ☐ Female

8. How old are you?
   - ☐ Under 18
   - ☐ 18 to 29 years
   - ☐ 30 to 64 years
   - ☐ 65 years or older

9. Is English your primary language (the one you speak most regularly)?
   - ☐ Yes
   - ☐ No

10. Do you have a cognitive, language, or learning disability?
- ☐ Yes
- ☐ No

11. Are you deaf or do you have serious difficulty hearing?
- ☐ Yes
- ☐ No

12. Which of the following best describes your vision?
- ☐ I have normal or corrected to normal vision. "Corrected to normal" means that if you wear glasses or contacts, they allow you to read newspapers, magazines, or books without trouble
- ☐ I have no vision at all; I cannot see light
- ☐ I can only see light and dark, and cannot read or see details under any circumstances
- ☐ I can only read large-print, high contrast text (I cannot read normal-sized text, even when wearing glasses or contacts, unless it is held very close to my face)

13. Do you have serious difficulty concentrating, remembering or making decisions?
- ☐ Yes
- ☐ No

14. Do you have problems with any of the following:
- ☐ Following instructions with multiple steps
- ☐ Understanding what you read or hear
- ☐ Identifying the main idea
- ☐ Reading or gathering information from tables or charts

15. When reading, do you often:
- ☐ Reverse letters, numbers, words, or phrases
- ☐ Confuse similar words
- ☐ See letters/numbers out of order
- ☐ Add, skip, or omit letters
- ☐ Not applicable

16. Which of the following best describes your use of your hands or arms?
- ☐ I have full strength and use of my hands and arms
- ☐ I have no use of my hands and arms
- ☐ I have limited strength and use of my hands and arms

(We're referring to the arm/hand that you primarily use, or would use when voting on an electronic system. Minor hand tremors are considered "full strength" unless accompanied by additional weakness or issues. Major uncontrolled tremors are included under "limited strength and use.")

17. Can you reach your arms straight out in front of you and keep them there for at least 10 seconds without any pain?
- ☐ Yes
- ☐ No

18. Can you perform delicate tasks with your hands (such as writing the alphabet with a pen) for extended periods of time without pain?

- [ ] Yes
- [ ] No

[If you need clarification, see note under #12]

19. Do you have any other significant physical or mental disabilities or conditions that may prevent you from using an electronic voting system?
- [ ] Yes
- [ ] No

20. Do you regularly use any of the following?
- [ ] Non-motorized wheelchair
- [ ] Motorized wheelchair
- [ ] Walker or cane
- [ ] Motorized scooter

21. What types of voting systems have you used in the past?
- [ ] None
- [ ] Mechanical lever (voter sets switches and pulls a lever)
- [ ] Punch Card (voter punches holes in a card)
- [ ] Touch Screen (voter touches a screen to record a vote)
- [ ] Optical Scan (voter fills in an oval or arrow on paper and the vote is checked by a machine)
- [ ] Paper and pencil (voter fills in an oval or arrow on paper and the vote is checked by a human)
- [ ] Internet (voter makes selection online and cast the ballots)
- [ ] Telephone (voter uses a phone to make selection and cast the ballot)

22. Which of the following items do you regularly use?
- [ ] ATM Machines
- [ ] Computer
- [ ] Device to record from TV (DVD, VHS, etc)
- [ ] Digital Camera
- [ ] Cell Phone
- [ ] Self-checkout at store

23. Do you rely on audio (that is, sound) to use computers or ATMs?
- [ ] Yes, I use audio in addition to reading the screen
- [ ] Yes, I only use audio and don't look at the screen
- [ ] No, I don't use audio at all
- [ ] Don't use computers or ATMs often

24. Do any disabilities interfere with your voting independently?
- [ ] Yes
- [ ] No
- [ ] N/A

25. Which of the following devices do you use often and without difficulties?
- [ ] Pen and paper
- [ ] Keyboard
- [ ] Computer mouse
- [ ] Computer trackball
- [ ] Touch-screen
- [ ] Keypad
- [ ] Mini-keyboard
- [ ] Joystick
- [ ] Light-pen

- [ ] Rotary input knob
- [ ] Speech recognition system
- [ ] Jelly switches
- [ ] Screen reader
- [ ] Other (please describe)

Post Test Questionnaire

Please complete the following questions:

1. To the best of my ability, I followed the instructions that told me the names of individuals to vote for and how to vote on the issues

☐ **Yes**
☐ **No**

2.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
I felt comfortable using the voting system.					

3.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
I would like to use this voting system in a real election.					

4.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
I found the voting system difficult to use					

5.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
I would need the support of a poll worker to be able to use this system					

6.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5

The instructions for interacting with this voting system (how to use the machine, not for who to vote for) were easy to understand.					

7.

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
	1	**2**	**3**	**4**	**5**
I would imagine that most people would learn to use this voting system very quickly					

8.

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
	1	**2**	**3**	**4**	**5**
I felt very confident using the system					

9.

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
	1	**2**	**3**	**4**	**5**
I needed to learn a lot of things before I could get going with this system					

--

10.

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
	1	**2**	**3**	**4**	**5**
The ballot text was easy to read or hear.					

11.

	Strongly	**Disagree**	**Neutral**	**Agree**	**Strongly**

	Disagree				Agree
	1	2	3	4	5
I was able to use the voting system without major problems.					

12.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
Writing-in a candidate was easy.					

13.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
This voting system was easy to use.					

14.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
The buttons on the touch screen were easy to use.					

15.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
It was hard to move around the ballot with this system.					

16.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
Correcting my mistakes					

was easy.					