VOX Research Report

FEBRUARY 2015

VOX RESEARCH REPORT

USER INSPIRATION RESEARCH. FEB. 5, 2015. V1.2.
PROTOTYPE 5.1.1/3.1.1

Summary

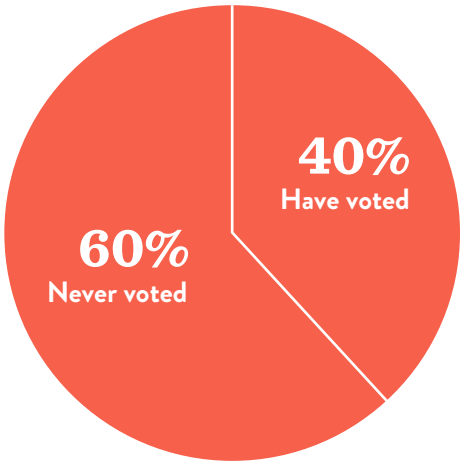
Overall, Vox user research provides inspiration, insight, and evidence to inform the design of the LA County voting system. Six to eight studies will be conducted during the next four months of iterative design. Smaller qualitative studies, such as this one, aim to provide in-process feedback on the usability and accessibility of potential design directions. Larger and more quantitative studies (to be completed in the future) then test these design directions with increasing rigor.

In this study, the IDEO team conducted five in-depth user sessions. Each session was qualitatively assessed by a team of ten IDEO designers. Synthesis revealed challenges and opportunities within the voting experience. These findings were immediately translated into design plans for the next iteration of system prototypes.

Participants

Five participants were purposively recruited for their diversity of experience and ability. User recruitment characteristics included: height (over 6’1” and under 4’6”), senior with minimal technical experience, person who relies on a wheelchair, Spanish-speaker, parent with a young child, person with learning disability, and young citizen who has never voted (18-22 years old).

Voting Experience



Methods

During in-depth user assessments, five participants completed the following tasks:

1. Approaching the booth and accessing the BMD screen and ballot slot.
2. Starting a vote session and setting preferences.
3. Voting on 9 contests with 3-4 different selection types.
4. Reviewing and changing votes.
5. Verifying and casting ballot.

During this experience, participants used the talk-aloud method of describing their actions and thoughts. Each session included 2-4 facilitators, who used a semi-structured guide to prompt tasks and ask specific questions. An observation and analysis team of 6-8 people watched the sessions through video conferencing in a separate room. After interacting with the prototype, the user session was concluded with in-depth questions about each user's experiences of voting across their lifetime. Each session was 60-75 minutes. Limitations and biases include Hawthorne effect[1], social desirability bias[2], and sampling bias[3]. These biases were mitigated by using neutral or negative probes, for example "How awkward or hard was that?", and our plan to triangulate across future studies with less obtrusive observation methods.

1 People tend to act differently when they know that they are being watched.
2 People tend toward social acceptable behavior and statements in a new social environment, often avoiding giving negative critique.
3 This is not a random or strictly representative sample of individuals, so their experience and feedback might not be representative of others'.

Prototypes

Two hardware prototypes depicted below (Version 5.1.1) were fabricated, each running versions of the User Interface (Version 3.1.1). These prototypes are detailed in the February 2015 Prototype Deliverable.

Findings

TOPIC 1: Accessibility of booth and BMD screen

BIG QUESTION: How might we design a booth and touchscreen BMD in a way that is accessible to diverse people?

WHAT WE'VE LEARNED: There is a range of comfortable ways to access the booth, BMD, and ballot slot, with 28inches from the floor being the ideal height for the bottom of the BMD screen.

DESIGN RECOMMENDATION: Continue forward with 28" clearance and explore

alternative mechanisms for articulating the screen angle.

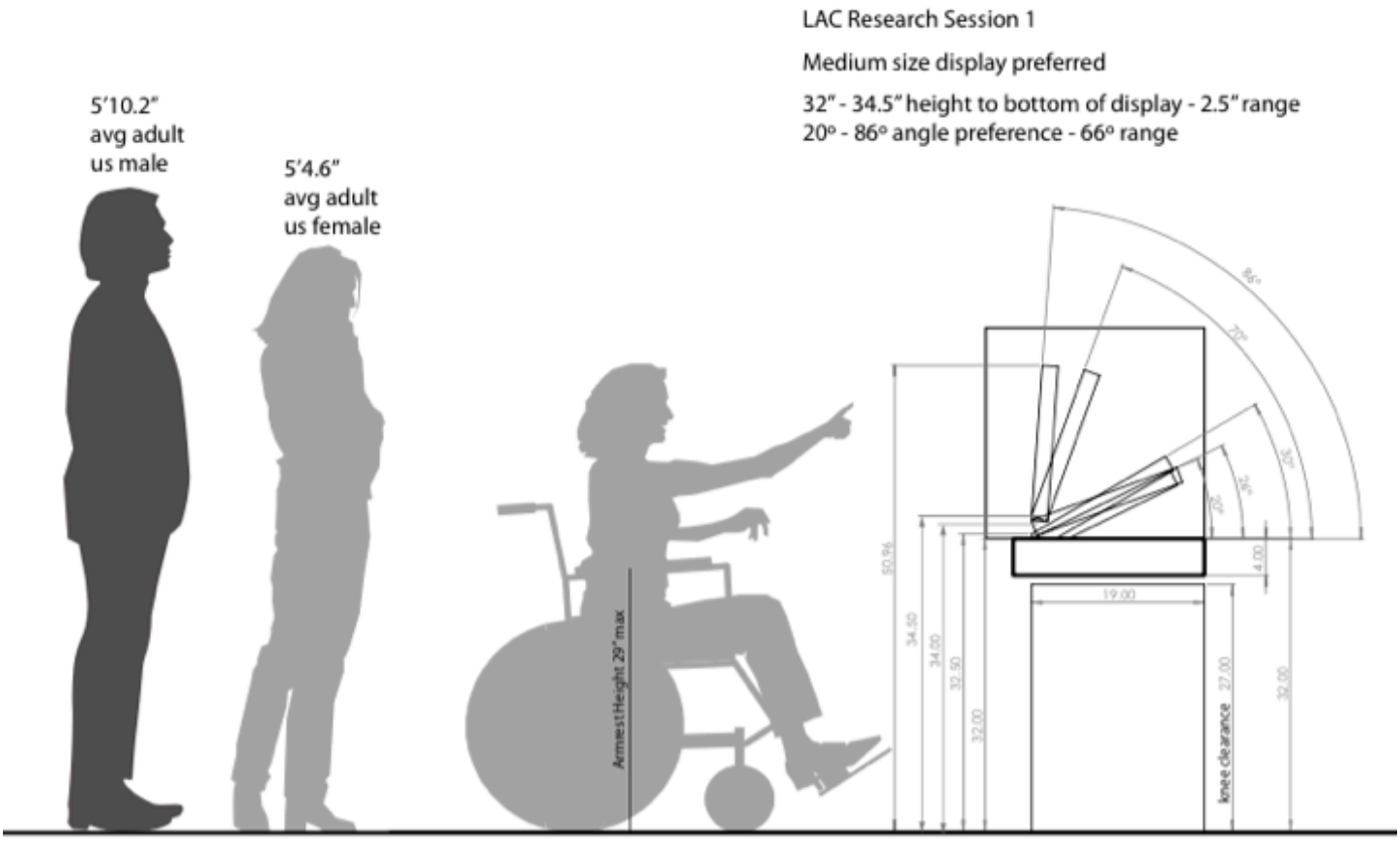
PRINCIPLES: Private & Independent. Easy.

DETAILS:

Research participants were first welcomed and oriented, then ushered into a room with the prototype set-up. As they approached the booth and situated themselves close to the BMD, users commented on its comfort and accessibility.

Users' heights varied from 6'4" to 4'6" (height from wheelchair), offering more extreme points of view than the average US adult. Users were able to adjust the table up and down, revealing a range of comfortable heights from 32" and 34.5" from the floor to the base of the display. At their preferred heights, none of the users felt constrained by the prototype's knee and foot clearance. The user who was reliant on a wheelchair was able to move close to the BMD without hitting her knees on the BMD table.

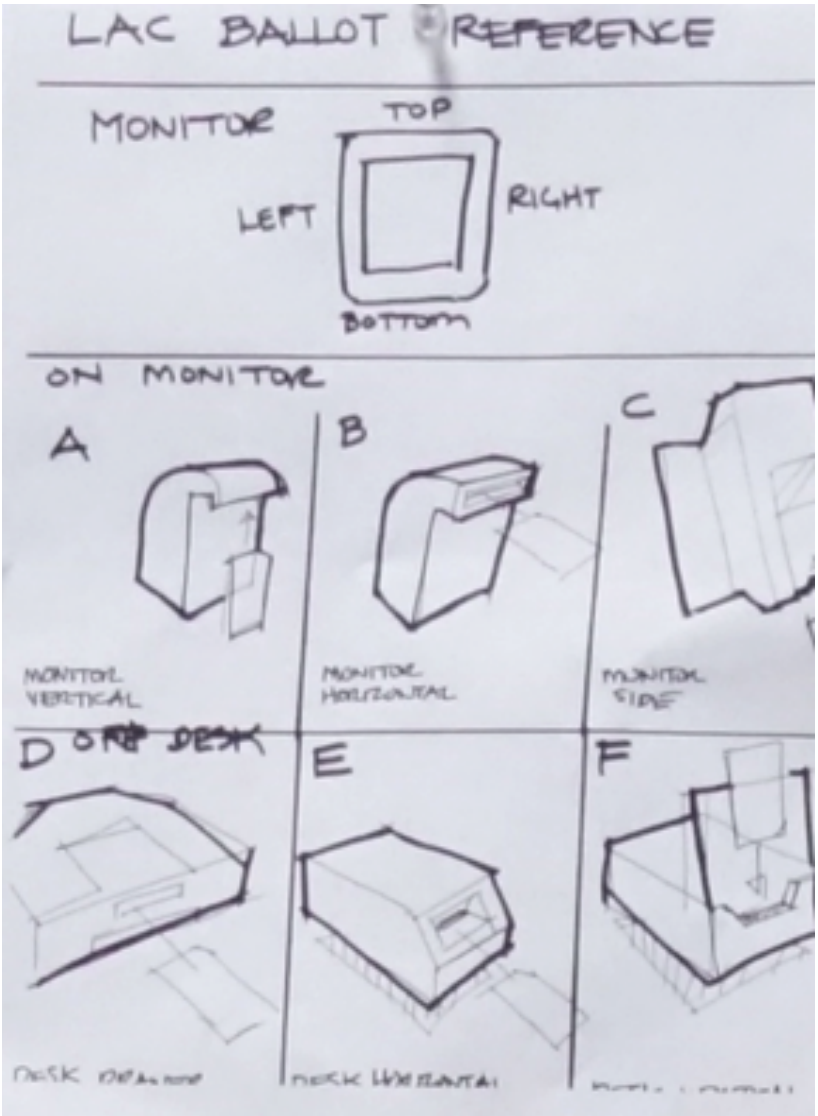
Users also tilted the screen according to their preferences. These preferences ranged broadly from nearly parallel to nearly perpendicular to the table. The tallest user preferred the most parallel, while the shortest user (from her wheelchair) could only touch all corners of the screen from the most perpendicular angle.



Screen accessibility also varied by screen size. Users were presented with one screen size (usually 15.6”) and probed for their impressions. Then, users were presented with larger (18.4”) and smaller sizes (12.3”) and asked which size they would prefer to use during the voting session. Several users reported that they would be willing to use the smallest size, making statements like “I am pretty good at making things work for me.” However, none preferred it to the other options. One user with poor vision initially chose the largest size, telling us that she “loved” the large font. Later, however, she switched back to the medium size because she struggled to reach and select buttons at the top of the large screen.

The team also prototyped landscape and portrait screen orientations with users. Users were presented first with portrait orientation and all users, with the exception of one, found this acceptable. Then facilitators probed further about landscape options, demonstrating the look and feel of this choice. All participants found the horizontal option acceptable, although they opted to continue the voting session in portrait.

Facilitators waited for participants to mention any privacy concerns and, when none of the users mentioned concerns, they were prompted on the topic. After prompting, several users mentioned a concern that people who were interested in seeing their votes might be able to peer over the privacy screen or from behind them as they voted. Those users who chose more perpendicular screen angles tended to be most concerned about privacy. One typical comment was “well, it would be pretty easy for someone to see what I was doing on this big bright screen if they were behind me.” Many users recommended a 6-10inch taller privacy screen and some recommended a way to protect privacy from behind such as a 360-degree curtain. Several users recommended computer screen privacy protectors that would limit potential onlookers’ ability to read from the peripheries.



TOPIC 2: Ballot slots.

BIG QUESTION: How might we design a ballot slot that is accessible and usable?

WHAT WE'VE LEARNED: Voters prefer simple, recognizable ballot slots. Accessibility might be enhanced by allowing voters to verify without needing to touch the ballot, however none of the voters at this session required this feature.

DESIGN RECOMMENDATION: Continue to refine option C and E.

PRINCIPLES: Private & Independent. Easy.

DETAILS:

Users were presented with six ballot slot prototypes, all constructed with simple white foamcore. As an early prototype, the paper ballot was not drawn in mechanically but rather played out by the facilitators who pulled the paper through the inside of the prototype by hand. Most preferred the ballot slots located to the right of the BMD screen, on the BMD screen, or directly below the BMD screen. Of note, all users were right handed. None preferred the mechanism that curved over the screen with a vertical insertion (option A). Some found the slots above the screen difficult to reach. The user who brought her 2-year old son was worried that he would try to insert other objects into ballot slots that were immediately accessible to him, particularly the slot option located directly below the screen. It should be noted, however, that these rough foamcore models did not provide the full mechanized experience and, therefore, might not inspire as much confidence and certainty as a fully functional version.

When probed on why they preferred one entry mechanism to another, many appreciated mechanisms that were familiar and trusted like an "ATM" or "lottery machine." Users did not appreciate mechanisms that directed the ballot downward, "like a shredder" or required them to push the paper up without the "help of gravity" to get it into the slot.

TOPIC 3: Preferences and cusomizations for the user interface.

BIG QUESTION: How might we enhance accessibility, usability, and privacy through customizable settings on the user interface?

WHAT WE'VE LEARNED: Most users preferred large font size and dark background with light text color contrasts, although flexibility in customizing the experience might benefit those with special requirements.

DESIGN RECOMMENDATION: Set default text to large and default contrast to dark background with light text, while creating preferences settings that can be altered by each user.

PRINCIPLES: Private & Independent. Easy.

DETAILS:

Once users inserted their ballot, facilitators prompted them to start their voting session. The first screens required users to set their language, contrast, and font size preferences. Four users selected English and one selected Spanish language. The Spanish-speaker was presented with monolingual Spanish-only content, which she understood with relative ease. After she completed her voting session, facilitators probed further on her language preferences. She was shown mock-up screens with three text options: bilingual English with Spanish subscript, Spanish with English subscript, and monolingual Spanish only. Among them, she preferred English with Spanish subscript.

After choosing a language, users advanced to the contrast preferences screen. Users frequently made comments like "which one is normal?" or "do I have to choose one of these?". They demonstrated uncertainty around the benefits of different contrast options and some annoyance in having to make a decision. In the end, most users preferred the default option, dark background with bright text.

On the final preferences screen, users were given three choices of font size: 18p (medium), 24p (large), and 32p (extra large). These font sizes represented the smallest font used on each interface, typically for the paragraph text, and larger font was often used for the heading text. All participants selected either large or extra large. None of the users selected medium. Although all reported being able to read the font in their chosen sizes, some still visibly struggled to read the print, putting on reading glasses, squinting their eyes, and getting closer to the screen.

TOPIC 4: Making selections on contests.

BIG QUESTION: How might we design an easy way to make selections on contests?

WHAT WE'VE LEARNED: Most users find the touchscreen interface intuitive and making selections is easy. The process of entering write-in names should be simpler.

DESIGN RECOMMENDATION: Continue to refine the selections process and explore intuitive ways to enter write-in names.

PRINCIPLES: Easy.

DETAILS:

After selecting their preferences, users began a voting session. All participants found the touch screen user interface immediately intuitive, understanding without pause that they could make selections by touching their chosen candidate's name, the "write-in" box, or yes/no. Similarly, advancing to the

next contest by clicking “next” in the lower right corner was also intuitive to all users. However, a few users mentioned that they expected to automatically advance to the next session after they made their selections, frustrated when advancing required the extra step of tapping “next.”

One older user with limited dexterity struggled with the screen’s touch responsiveness, often unable to exert enough capacitance with her fingertip. It was unclear whether touchscreen responsiveness was limited because of her lack of strength or small imprint size of her fingertip. Eventually, she adjusted by making her selections with a forceful knuckle tap. The lack of responsiveness from the screen also meant that she sometimes double clicked accidentally. During one of these instances, she selected and then mistakenly unselected a candidate’s name. This error was immediately obvious to her and she corrected the selection with a more intentional single knuckle tap. During another instance, however, she accidentally skipped a contest and continued on without realizing that she had missed it. Without prompting from facilitators, she noticed the mistake on the review screen and went back to correct it before submitting her selections.

Users were prompted to add a write-in candidate. Selecting the write-in option was intuitive to all users, however most struggled to activate the pop-up keyboard. To do so, a user had to touch the text inside of the “write-in” box. Once the qwerty keyboard appeared, all users were able to use it to type a write-in name without any perceived challenges. Of special note, low literacy users and users with minimal experience with technology also found this keyboard intuitive. After typing the candidate’s name, most users neglected to select this write-in candidate by checking the box next to the write-in text. Then, they did not realize this error until the review screen and felt frustrated by the need to go back, add the name again, and select the box next to the added name.

TOPIC 5: Reviewing selections.

BIG QUESTION: How might we design an easy way to review and edit selections before printing on the paper ballot?

WHAT WE’VE LEARNED: The process of reviewing selections was easy, however it was challenging for some users to understand scrolling mechanisms and frustrating for most users to efficiently navigate to and from the review screen to change selections.

DESIGN RECOMMENDATION: Continue to design simple mechanisms for scrolling, an inevitable need for the review interface, and refine the navigation for editing selections.

PRINCIPLES: Easy.

DETAILS:

The selections review interface was somewhat intuitive for users. Space limitations with every screen size meant that the review interface could only display 6-8 contest selections. The review screen gave no special prompts or directions about scrolling. While most users immediately understood that they could scroll down using gestures, some did not grasp that there were more votes to review "below the fold" and did not know how to scroll down. Once instructions were provided, though, all users quickly learned and used gestures for scrolling.

Users intuitively understood how to change their selections from the review screen. After altering or adding a vote for a single contest, however, most were frustrated by having to advance through the entire list of contests before arriving, again, at the review screen. Many requested an easy to return to the review screen, either not noticing or understanding that just such an option was built into the "review your votes" button on the top right corner of each screen.

TOPIC 6: Casting paper ballot.

BIG QUESTION: How do central and integrated ballot boxes compare in terms of usability and acceptability?

WHAT WE'VE LEARNED: Although users found either central or integrated ballot boxes usable and acceptable, most prefered the efficiency and privacy of starting and finishing the voting experience within the booth.

DESIGN RECOMMENDATION: Continue to test user ballot box preferences and refine the process of casting into an integrated ballot box through the ballot slot.

PRINCIPLES: Private & independent. Easy.

DETAILS:

After users finalized their selections on the digital BMD, many felt that it was redundant to then print, verify, and cast a paper ballot. The role and importance of the paper ballot was not clear to most users. Holding up her paper ballot, one user asked, "What do I do with this? Bring it home, I guess?" None of the users demonstrated an interest in verifying their printed ballot, perhaps because they were aware that this system was an early prototype. However, it was interesting to note that when probed about why they did not actually verify their votes, several users made comments like "I trust the machine."

Statements like this were reiterated when users experienced casting their votes through an integrated and centralized ballot box. By default, the IDEO team first walked users through the integrated ballot box option and probed for their response. All users felt comfortable with this option and reported that they felt secure about casting in this way. Participants were then asked to cast their votes using a centralized

ballot box. All users reported preferring the integrated option, saying “I just want to finish everything right here, at the machine, and go home,” “it doesn’t feel safe to take this ballot across the whole room to put it in another box,” “I just don’t want to deal with people sometimes, I guess I trust the machine more than I’d trust a person with my vote.” The participant who relied on a wheelchair reported that “it would be a pain to have to go somewhere else now,” referring to the extra energy that it might take her to navigate a polling place. One user even suggested that she would like to get her sticker from the voting system so that she could avoid having to approach a poll worker to ask for one.

Users were visibly excited to receive the “I voted” sticker at the end of the session. Receiving the sticker was an indication that they had cast their vote. In one instance, when a facilitator asked “do you feel like you’ve finished?”, a user responded “Yes, I have my sticker, don’t I?” Even those users who had never voted in the past, knew about and the “I voted” sticker and connected receiving it to having casted their vote.
Based on these six findings, we recommend advancing our design in several ways.