



VOX Research Report

ELECTIONS OPERATORS
MAY 2015

LOVE THAT
THERE'S NOT
A LOT OF
LOUING/ POSITIVE
INT

LOOSE
STUFF
SOMETIMES
DOESN'T
COME BACK



to the
table
with the
the bad paper

WHAT
HAPPENS
IF IT'S NOT
CATCHED?

How do
the printer?

COLOR
LOADING
IS A
CHALLENGE

SCANNING
ALL

AS

VOX RESEARCH REPORT

ELECTIONS OPERATIONS EXPERIENCE

APRIL 29, 2015. V1. PROTOTYPE 5.1.4

Summary

This elections operators focus group provided the IDEO team with qualitative data to inform our iterative design of the Elections Operations Center (EOC) hardware/software experience. To date, the voting experience has been optimized for the voters. Data from this session will help the IDEO team design an operations experience that is optimized for the EOC.

We engaged diverse participants, discussing their roles as elections operators, setting-up and taking-down two prototype systems, and providing feedback on the next iteration of hardware design. Data analysis from the focus group led to the following insights:

1. Elections equipment must be optimized for storage and transportation to/from warehouse, delivery trucks, and polling places.
2. Polling place equipment must have as few separate parts as feasible.
3. Operators need easy access to printer, screen, and ports in the EOC stored configuration.



Participants

A total of ten elections operators participated. Participants were recruited using a non-representative sampling method called purposeful selection. Unlike representative sampling, which attempts to recreate the demographics of a particular community through techniques like random selection within a sampling frame, purposeful selection intentionally targets people who represent groups of interest within a community. For this study we purposely selected participants whose jobs represent the range of tasks that are critical to elections operations. Elections operators were selected and recruited by the RR-CC office. In addition, Kenneth Bennett, Blanca Lopez, Kenny Ling, Adrian Avelar, and Daniella DeLea from VSAP core team within the RR-CC office were present for the focus group.



Methods

This focus group engaged ten elections operations staff with diverse roles and responsibilities in discussion and activity around three key themes:

1. elections operations tasks
2. booth set-up and take-down
3. prototype development

The focus group was facilitated by IDEO researcher, Caricia Catalani, with assistance from four members of the IDEO hardware team: Jesse Fourt, John Lai, Jordan Lay, and Albert Leung. The team used a semi-structured discussion and activity guide.

Participants assembled, examined, and disassembled two hardware prototypes in small groups of 5. The design team observed the aspects of the processes that were easy and intuitive as well as difficult and frustrating. The team then engaged elections operators in discussion around what they preferred and why. Elections operators discussed their ideas with the design team and each other.

Overall limitations and biases for the study include Hawthorne effect¹, social desirability bias², and sampling bias³. The impact of these limitations and biases may have been reduced by a sense of comfort and openness during the session, which was demonstrated by the participants' willingness to critique the prototypes and offer their expertise on further refinement.

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 (Version 5.1.4) were used to facilitate activity and discussion. These prototypes, nicknamed sawhorse (left images) and speaker (right images), are detailed in the May 2015 Prototype Deliverable.



CHECK

Property of
U.S. Bank National of Texas
877-728-0235

Property of
U.S. Bank National of Texas
877-728-0235

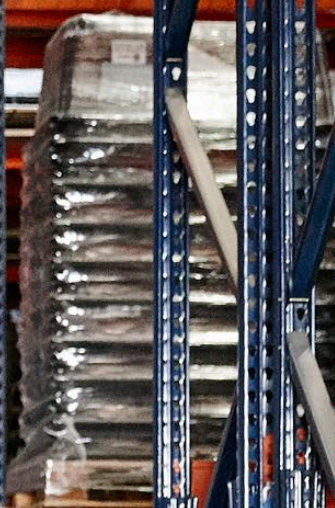
Property of
U.S. Bank National of Texas
877-728-0235

Property of
U.S. Bank National of Texas
877-728-0235

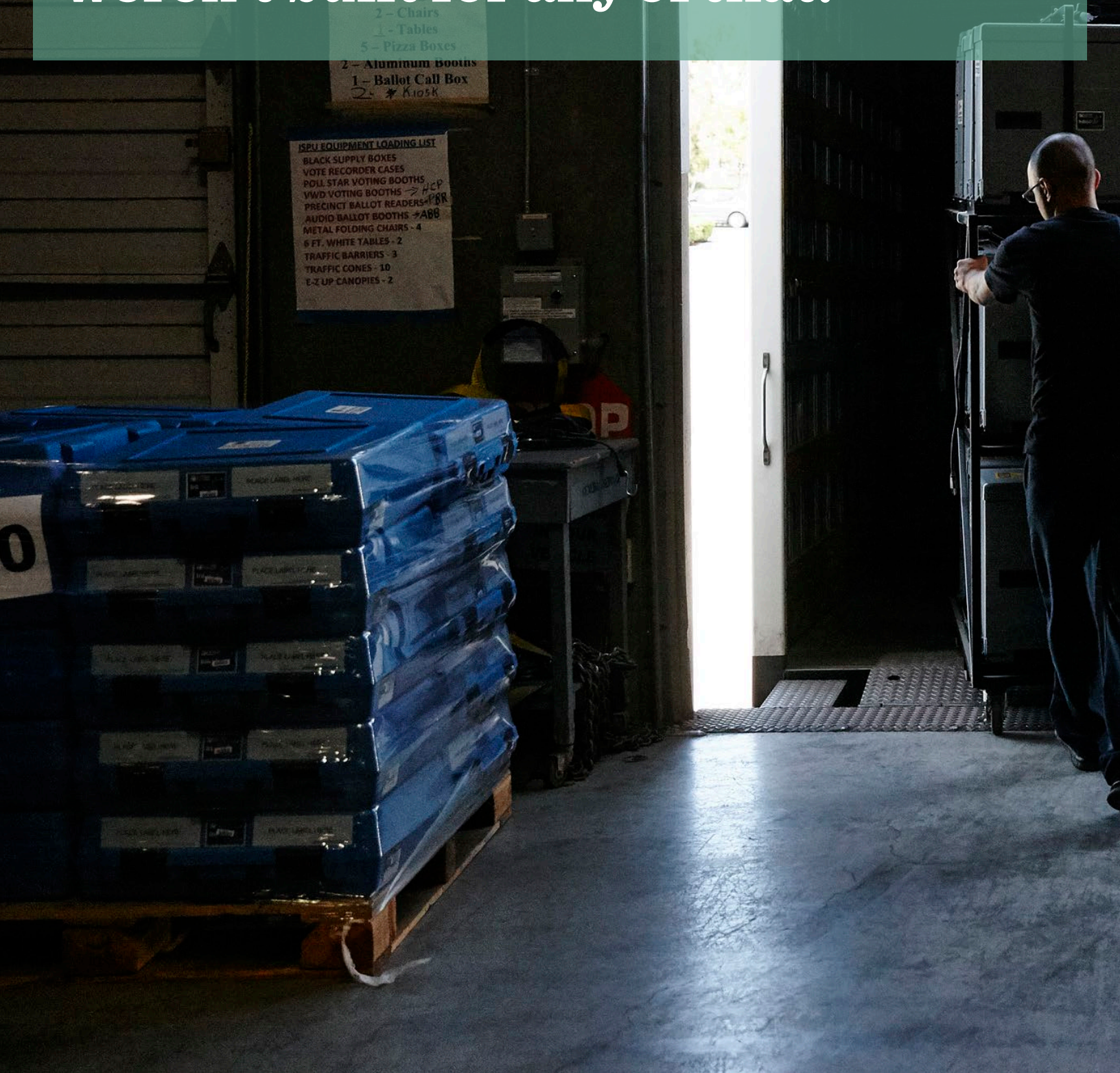
Property of
U.S. Bank National of Texas
877-728-0235

Property of
U.S. Bank National of Texas
877-728-0235

7



“These old machines see a lot. They live here. They get deployed. They sit in trucks for days. We get them out to 5000 locations. And they weren’t built for any of that.”



INSIGHTS & FINDINGS

TOPIC: Storage & Transportation

BIG QUESTION: How might we design a voting system that's optimized for storage and transportation?

WHAT WE'VE LEARNED: Elections equipment must be stored and transported in EOC warehouse, deployment trucks, and polling places. Although each of these stages has its own requirements, there is a consistent need for equipment to be stackable, nestable, and rollable.

DESIGN DECISION: Continue refining the "speaker" prototype, improving the system's storage and transportation by adding allowances for stacking, nesting, and rolling.

PRINCIPLES: Easy for election workers

Background

Elections operators manage, maintain, repair, prepare, and deploy all of the equipment needed for polling. Although the current warehousing system would likely need to be redesigned for new equipment, there are essential lessons to learn about the general tasks of elections operators and their current challenges and workarounds. Ideally, the new system would take advantage of the space, personnel, and resources already used for Los Angeles County elections. To learn more about this, the IDEO team engaged elections operators in a discussion about the current system and two hardware prototypes.

Findings

EOC (election operations center) workers described the many stages of operations, including:

- storage & maintenance,
- elections loading,
- packing into EOC trucks,
- transportation to polling places or equipment drop-off sites,
- transportation from polling places and equipment pick-up sites,
- in-truck waiting periods after elections, and
- restocking and restoring for at the storage facility.

During each of these stages, the equipment must be fit to move and stow.

Elections operators described their frustrations about the current system, one saying, "Last time, with the last vendor, they just said 'here it is, now you deal with it!' We weren't part of designing it. This time we have a say. When we discovered a problem, like getting them into racks and into trucks, we had to come up with a way to deal with it on our own."

Operators identified three specific issues that facilitated storage and transportation during each stage of the process.

1. All parts of the system must be stackable in racks or on top of each other on pallets. The sawhorse prototype included a round tube, which all operators said would be highly problematic, because round parts were too difficult to stack. The speaker prototype was transportable in a rectangular box, a feature that most elections operators said was quite valuable. Stackability might be enhanced, they suggested, by nestable cases. Many mentioned that paletting the ABB was challenging, even though the case is rectangular, because they slide around in transit. Their inability to nest has resulted in a lot of damage.
2. The staff at elections operations described having to design special racks for the PBR that took all of the stages of operations into consideration. The racks allowed the staff to move the PBR easily, access all sides of the device, and quickly load them in and out of vehicles.
3. Once equipment is removed from racks or pallets, the last leg of their journey involves moving them into polling places, usually by pollworkers. Elections operators suggested that robust wheels would facilitate this last leg, making it easier for pollworkers with minimal physical capacity to prepare heavy equipment for set-up and poll openings.

Recommendations

We recommend continuing to enhance the ease of storing and transporting devices by adding features that facilitate their ability to be stacked, racked, nested, and moved by pollworkers and elections operators. Although features of both prototypes embodied some of these ideals, we will further refine the speaker concept to optimize it for storage and transportation.

“Every time you add a part, you add an entire process to operations.”



INSIGHTS & FINDINGS

TOPIC: Hardware management

BIG QUESTION: How might we design voting equipment that's easy to maintain & deploy?

LEARNED: Every piece of election equipment has to be carefully monitored & managed from warehouse to polling place. One less part means one less operational process.

DESIGN DECISION: Create a system with as few separate parts as feasible.

PRINCIPLES: Easy for election workers

Background

In the current operations system, election workers manage all of the county's equipment year round and their efforts intensify in preparation for every county election. The IDEO team learned about maintenance and deployment processes, generalizing across the particulars to identify some fundamental truths about what makes their work easier and harder.

Findings

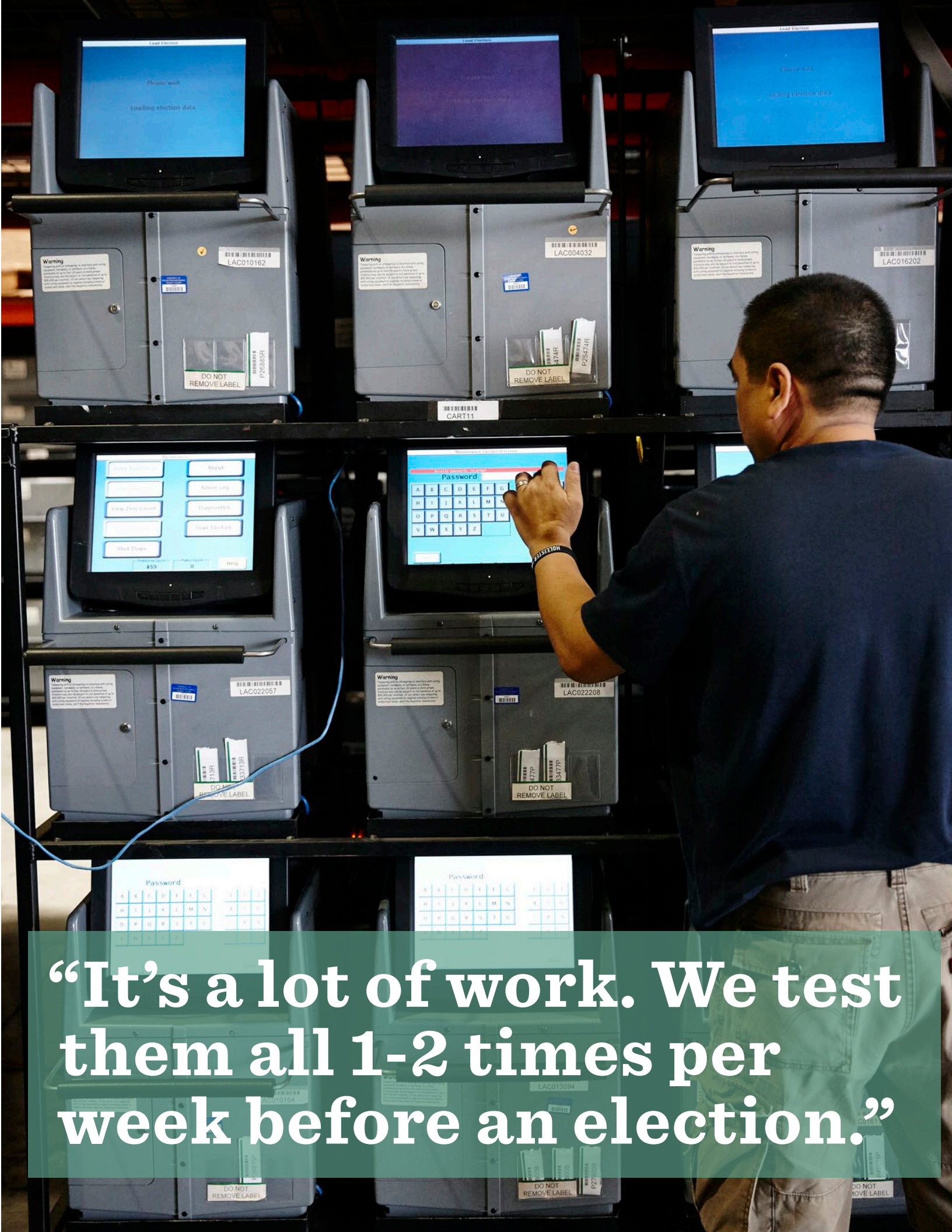
As election workers demonstrated the care and attention required to manage and maintain every piece of equipment, it became clear that each separate piece has a particular intake, repair, storage, quality check, packing, and tracking throughout the chain of custody process. As one election worker put it, "Every time you add a part, you add an entire process to operations."

To illustrate this point, elections workers showed us the full journey the PBRs. They must be accounted for and maintained as they move from warehouse to truck to parking lot to deployment centers to pollworkers' personal vehicles to pollworkers' homes to polling places and back.. They explained the flawed aspects of their processes, always aware of threats to the integrity of equipment as it traveled. "If there are 200 separate parts, then we have 200 separate processes," one clarified.

When the election workers examined the two IDEO hardware prototypes, they preferred the approach that was more "all-in-one". The speaker prototype involved four separate parts that packed into a single and relatively heavy unit for transport; the sawhorse prototype involved eight separate parts that packed into three separate and relatively light units for transport. The speaker's approach was generally favored over the sawhorse.

Recommendations

We recommend moving toward an all-in-one approach, building on the speaker approach to simplify and eliminate parts when feasible.



“It’s a lot of work. We test them all 1-2 times per week before an election.”

INSIGHTS & FINDINGS

TOPIC: Hardware storage & maintenance.

BIG QUESTION: How might we design a voting system that can be easily maintained and prepared for deployment?

WHAT WE'VE LEARNED: Operators need easy access to printer, screen, and ports.

DESIGN RECOMMENDATION: Design a mechanism for accessing printer, screen, and ports of BMD while stored in racks. This mechanism should involve a minimal number of touches from elections operators per BMD.

PRINCIPLES: easy for elections workers.

Background

Election workers are responsible for testing all equipment and loading election data. This typically takes place while equipment is stored in racks. Efforts are year-round and intensify before elections. The IDEO team learned about the current challenges for testing and elicited recommendations from election workers around ways to make this task easier.

Findings

Elections workers need to connect to data ports and run diagnostic tests on each piece of hardware 2-3 times per week. This amounts to hundreds of tests per year and thousands of labor hours. Workers discussed the importance of facilitating these tasks and demonstrated how their current racking system facilitates access to PBR ports.

While examining IDEO's prototypes, operations workers discussed ways to improve them to facilitate maintenance and deployment. They identified which aspects of the equipment need to be accessible while the systems are in storage.

1. To upload election data, operations workers need to access an ethernet data port and either LED indicator lights or screen with diagnostics UI.
2. To run printer diagnostics tests and calibration, operations workers need access to printer and either LED indicator lights or screen with diagnostics UI.
3. To run touchscreen diagnostics tests and calibration, operations workers need access to the screen.

Operations workers would, preferably, be able to access these resources with as few physical touches per unit as possible. Removing covers and unlocking cases on each device, for example, requires substantial labor time.

Recommendations

We recommend refining the current prototypes by enhancing access to printer, screen, and ports. Diagnostic LEDs and a diagnostic user interface on the screen might also be considered.

AUTHORSHIP & CONTRIBUTORS

IDEO, 2015

REPORT AUTHORS: Caricia Catalani, Jesse Fourt, & Matt Adams.

IDEO TEAM: (Alphabetical) Matt Adams, Blaise Bertrand, Suzanne Boutilier, Caricia Catalani, Jesse Fourt, Casey Kawahara, Ethan Klein, John Lai, Jordan Lay, Skye Lee, Albert Leung, Shelagh McLellan, Kaitlin O'Donnell, Tim Oppsahl, Migne Padegimaite, & Nastasha Tan.

LOS ANGELES COUNTY REGISTRAR-RECORDER / COUNTY CLERK VSAP TEAM:

(Alphabetical) Adrian Avelar, Kenneth Bennett, Daniella DeLea, Rita Figueroa, Monica Flores, Jeramy Gray, Kenny Ling, Dean Logan, Tim McNamara, and Debbie Martin.

VSAP ADVISORY COMMITTEE: (Alphabetical) Eric Bauman of the Los Angeles County Democratic Party, Theresa Devoy of the City of Norwalk, Efrain Escobedo of the California Community Foundation, Kathay Feng of California Common Cause, Carolyn Fowler of the Los Angeles County Democratic Party, Ron Hasson of Beverly Hills / Hollywood NAACP, Larry Herrera-Cabrera of the City of Long Beach, Jaclyn Tilley Hill of the Quality and Productivity Commission at the County of Los Angeles, Mimi Kennedy of the Progressive Democrats of America, Terri Lantz of United Cerebral Palsy of Los Angeles, Justin Levitt of Loyola Law School, Nancy Mahr of the League of Women Voters of Los Angeles County, Ofelia M. Medina of NALEO Educational Fund, Deanna Kitamura of Asian Americans Advancing Justice, Mark Vafiadies of Los Angeles County Republican Party, Holly L. Wolcott of the City of Los Angeles, and Bryce Yokomizo of the California State University, Northridge, School of Public Administration.

VSAP TECHNICAL ADVISORY COMMITTEE: (Alphabetical) Henry Balta of Los Angeles County Chief Information Office, Michael Byrne of Rice University, Joshua Franklin of the National Institute of Standards and Technology, Diane Cordry Golden of the Associations of Assistive Technology, Joseph Lorenzo Hall of the Center for Democracy and Technology, Brian J. Hancock of the U.S. Election Assistance Commission, Jared Marcotte of the Pew Charitable Trusts, Whitney Quesenbery of the Center for Civic Design, Noel Runyan of Personal Data Systems, Rich Sanchez of the County of Los Angeles, Pamela W. Smith of Verified Voting Foundation, Charles Stewart III of Massachusetts Institute of Technology, and David Wagner of the University of California, Berkeley.



