USABILITY TESTING IN THE DEVELOPMENT CYCLE

- Presented at the National Institute of Standards and Technology
- Voting Symposium
- Panel on Accessibility and Usability
  - Gaithersburg, Dec. 11, 2003
  - Sanford J. Morganstein
Our Approach to this Presentation

- Surprising things happen when you focus on usability and accessibility for voting
- We will show screen shots and explain design decisions that may not be intuitive
- Apologies if the screen shots are small, but we think this helps to explain the design decisions
Continual Refinement

- Design personnel and public affairs personnel participate in mock elections and focus groups
- Voting studies and/or interviews held with:
  - Disabled advocates
  - Seniors
  - Language groups
  - Election Officials

Dec. 11, 2003
Some Background

The First Screen

STATE OF MISSOURI, GENERAL ELECTION, Oct 28, 2003

OFFICIAL BALLOT

Select ONE

☐ To the voter:
Touch the screen here to vote in English.

☐ Al votante:
Toque la pantalla aquí para votar en español.

☐ VOTERS WHO HAVE DIFFICULTY READING THIS SCREEN:
Please see an election judge.
The Second Screen: Instructions

Instructions

You are voting using a Touch Screen.

Simply use the stylus to touch the screen near your selection.
The candidates, referendum questions and other propositions will appear
near the middle of the screen.

Once you make your selection, you may go to the next page by
touching the arrow at the bottom of the screen.

Dec. 11, 2003
The Election That Started It All

- Audible and Visual Feedback
- Context Sensitive Instructions
- A dilemma
Things We Learned

- Use color, not animation, to highlight context sensitive instructions
- Some jurisdictions asked for “punch numbers”
- Scrolling disadvantages someone
- One touch choice change

Dec. 11, 2003
Non-Intuitive Feedback

- De-bounce or desensitize screen
- Do not provide immediate warnings for undervotes
- The Vote for more than 1 problem
- The write-in dilemma

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FEDERAL OFFICE
FOR PRESIDENT AND VICE PRESIDENT OF THE UNITED STATES

<table>
<thead>
<tr>
<th>Vote for One</th>
<th>Instructions: Erase your choice by touching it again. Change your choice by touching another choice. Write-In Instructions: Write the name of the Write-In candidate on your ballot card after printing the ballot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>REPUBLICAN</td>
<td>GEORGE W. BUSH DICK CHENEY 2 WRITE-IN 14</td>
</tr>
<tr>
<td>DEMOCRATIC</td>
<td>AL GORE JOE LIEBERMAN 4</td>
</tr>
<tr>
<td>LIBERTARIAN</td>
<td>HARRY BROWNE ART OLIVIER 6</td>
</tr>
<tr>
<td>GREEN</td>
<td>RALPH NADER WINONA LADUKE 8</td>
</tr>
<tr>
<td>REFORM</td>
<td>JOHN HAGELIN NAT GOLDBER 10</td>
</tr>
</tbody>
</table>

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When Laws Collide

CONSTITUTIONAL AMENDMENT
EQUAL RIGHTS AMENDMENT

Instructions: Touch anywhere near your selection on this screen. Touch again to erase it.

Shall the Constitution of the United States be amended providing that no federal, state or local government shall pass any law discriminating against any person based on gender?

☐ Yes  50

☐ No  51

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Please see an election judge.
Voters Who Have Difficulty Reading

You are hearing instructions…

You will know you tapped hard enough…

Beep (high)

Beep (low)
Feedback From Blind Voters

- Provide instructions in Braille and audibly
- Have “normal” and Power User Mode
- Unsolved Problem: To skip or not to skip
Reflection and OUR Input to NIST

- “Ones man’s access is another man’s barrier” - Ken. Access Living; Chicago
- The twin goals of Usability and Accessibility are complementary and must be brought to bear as soon as possible (punch cards are hardly usable and are not accessible).
- The emphasis on Continual Refinement necessarily means that we have short term goals and long term goals. We should not let our long term goals get in the way of short term goals. Nor should we let our short term goals get in the way of our long term goals.
- In its Congressional Mandate, NIST should strive to balance the needs of certification against the need of improving Accessibility and Usability as soon as possible.

Dec. 11, 2003