

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

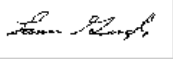
- Design personnel and public affairs personnel participate in mock elections and focus groups
- Voting studies and/or interviews held with:
 - Disabled advocates
 - Seniors
 - Language groups
 - Election Officials

Some Background

The First Screen

STATE OF MISSOURI, GENERAL ELECTION, Oct 28, 2003

OFFICIAL BALLOT


MATT BLUNT
SECRETARY OF STATE

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.

Instruction Page

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.

Begin Voting



The Election That Started It All


- Audible and Visual Feedback
- Context Sensitive Instructions
- A dilemma

FEDERAL OFFICE
FOR PRESIDENT AND VICE PRESIDENT OF THE UNITED STATES

Instructions: Touch anywhere near your selection on this screen.

Vote for One

<input type="checkbox"/>	REPUBLICAN GEORGE W. BUSH DICK CHENEY	2	<input type="checkbox"/>	WRITE-IN	14
<input type="checkbox"/>	DEMOCRATIC AL GORE JOE LIEBERMAN	4			
<input type="checkbox"/>	LIBERTARIAN HARRY BROWNE ART OLIVIER	6			
<input type="checkbox"/>	GREEN RALPH NADER WINONA LaDUKE	8			
<input type="checkbox"/>	REFORM JOHN HAGELIN NAT GOLDHABER	10			

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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

FEDERAL OFFICE
FOR PRESIDENT AND VICE PRESIDENT OF THE UNITED STATES

Vote for One

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.


<input type="checkbox"/>	REPUBLICAN GEORGE W. BUSH DICK CHENEY	2	<input checked="" type="checkbox"/>	WRITE-IN	14
<input type="checkbox"/>	DEMOCRATIC AL GORE JOE LIEBERMAN	4			
<input type="checkbox"/>	LIBERTARIAN HARRY BROWNE ART OLIVIER	6			
<input type="checkbox"/>	GREEN RALPH NADER WINONA LaDUKE	8			
<input type="checkbox"/>	REFORM JOHN HAGELIN NAT GOLDBABER	10			

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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

FEDERAL OFFICE FOR PRESIDENT AND VICE PRESIDENT OF THE UNITED STATES		
Vote for One		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.
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<input checked="" type="checkbox"/>	WRITE-IN	14

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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.

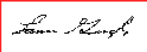
Shall the Constitution of the United States be amended providing that no federal, state or local government shall pass any law discriminating against any person based on gender?

<input type="checkbox"/>	Yes	50
<input type="checkbox"/>	No	51

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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.