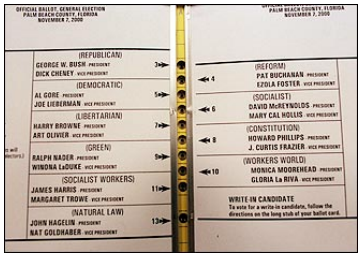
Lecture 2: Impact and Influence con't.

- Palm Beach ballot
- Business examples
- Cost Justification

Human Factors and the 2000 Election

- Palm Beach Ballot ("Butterfly" Ballot)
  - Was there a problem?
  - Was it obvious or not?
  - Was it a big problem; human error; correctable?
- Dimpled Ballots

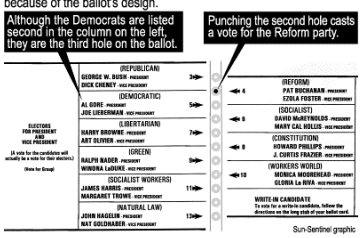


Confusion at Palm Beach County polls

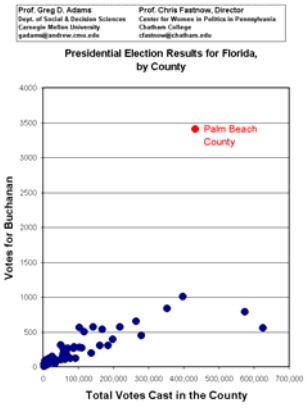
Some Al Gore supporters may have mistakenly voted for Pat Buchanan because of the ballot's design.

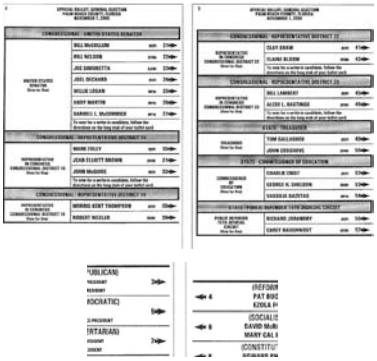
Although the Democrats are listed second in the column on the left, they are the third hole on the ballot.

Punching the second hole casts a vote for the Reform party.



Sun-Sentinel graphic





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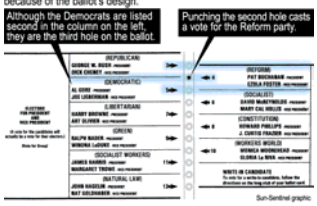

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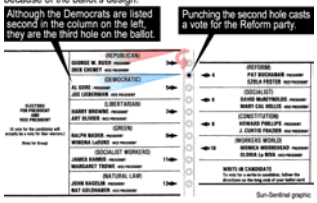

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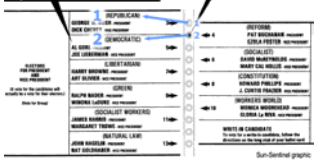
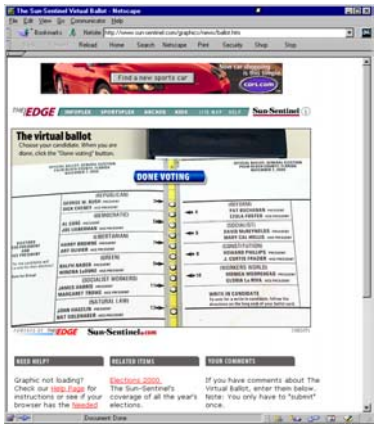
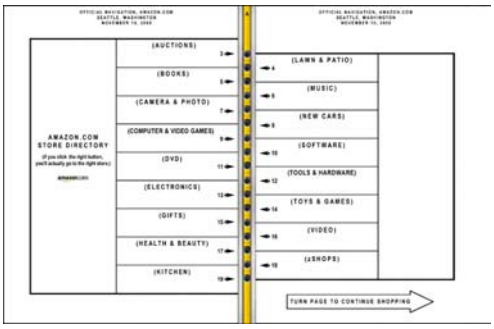




"New" Amazon.com navigation page:



Sources (2001)

Empirical analyses:
- http://madison.hss.cmu.edu/
- http://www.si.umich.edu/~presnick/BallotConfusion

Usability experts:
- http://www.danbricklin.com/log/ballotusabilty.htm
- http://fury.com/galleries/palmbeach/index.php

Informal analyses:
- http://faculty.fuqua.duke.edu/~cfox/Bio/election2000note.pdf
- http://www.humanfactors.com/library/election.asp

And, on the lighter side ...
- http://www.ntk.net/nielsen2004/
- http://www.amazon.com/exec/obidos/subst/home/all-stores-ballot.html

Thought Questions

- How obvious to an "expert"?
- Would usability testing help?
- 99% of voters understood ballot (Bailey)?
  - Is this true
  - How / would usability testing have helped?

Bailey – Solve Dimpled Ballot Problem

- Usability Testing
  - Instructions
  - Holding and action of punch stylus

STEP 3 -- To vote, hold the voting instrument straight up.
Punch straight down through the ballot card for the candidates of your choice.

AFTER VOTING, CHECK YOUR BALLOT CARD TO BE SURE YOUR VOTING SELECTIONS ARE CLEARLY AND CLEANLY PUNCHED AND THERE ARE NO CHIPS LEFT HANGING ON THE BACK OF THE CARD.

Subsequent Developments

- Congress: Help America Vote Act 2002
  - Funds to replace older technology with optical scan and computer-based technology (DRE)
- IEEE Standards Project 1583
  - Voting Equipment Standards
  - Standard evaluation for *accessibility**, accuracy, confidentiality, reliability, security, and *usabilty**
  - **Sections developed by Human Factors and Ergonomics Society*
  - Out for ballot

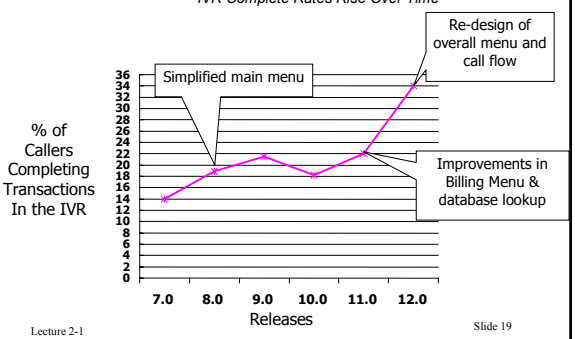
O'Hara (2002) "Improving Voting Systems"

- Halo effect of new technology
  - It's not punch card, therefore, all problems are solved
- Florida trial
  - New York Times – voter comment: "If they took out something that wasn't working, why did they put in something that works even worse"
- Old problems disappear, new problems appear
- Voting system: all elements must work
- All components and their *interaction*
  - Hardware, software, database, communication, *human*

Business Significance of UI Design

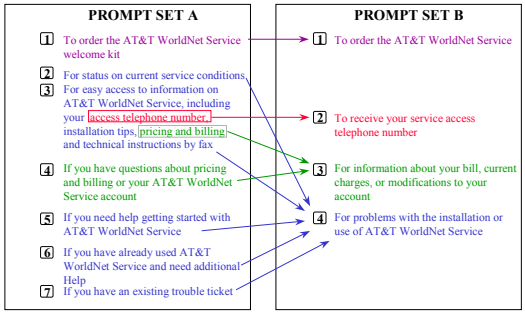
- Usability can make money
- Examples from IVR Design
- Cost-Justification

Business Significance of UI Design: Example
IVR Complete Rates Rise Over Time



Interactive Voice Response (IVR) Customer Care System

Small Changes - Big Savings
10% Increase in automation = $$M savings



Wbw: Nov. 18, 1999

IVR Example

- Improvements
  - Eliminated redundancy and conceptual overlaps
  - Selected and ordered words for brevity and clarity
  - Balanced breath & depth of menus
    - Match human memory characteristics
- Business Impact
  - Automated system answered 10% more questions
  - Millions of dollars in savings

Cost Justifying Human Factors (1)

- Increase product/service revenues due to increased marketability
  - Issues: how to "sell" usability vs. features
- Decreased costs for customer support
- Decreased costs from increased productivity or efficiency
  - Example: prompts which reduce hold time may save telephone company literally millions of dollars
- Decreased expenses from product liability

Cost Justifying Human Factors (2)

- Advantages for internal information systems:
  - Increased employee productivity and satisfaction
  - Decrease costs for training, support, service, personnel, and maintenance
  - Decrease financial impact of errors
    - Example: rerouting telephone service due to cable cuts
- Decrease cost of development cycle, shorten development time for products and services
  - Early user interface design involvement catches bad errors early in design cycle, where things are easy to change. Mistakes found in system test or after product is sold is costly.

Example: From Mauro (1994)

- Printer manufacturer – serious usability problem
  - printer driver installation & operation
- 50% of first 100,000 customers called customer care
  - $ .5 million per month
- Poor reputation
  - Overloaded customer care phone system
- Delivered fix on new diskettes to 200,000 customers
  - $ 900,000
- Problem could have been fixed in usability testing
  - Tested internally by engineering group – found no problems