Efficient Techniques for Evaluating UI Designs

CSE 403

Outline

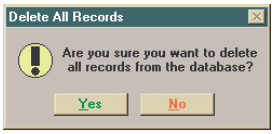
- Usability testing
- Heuristic Evaluation
  - Nielson's heuristics
  - Severity ratings

Resources

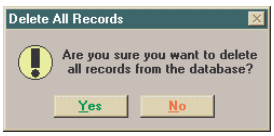
- CSE 490JL Au'04, 510 Sp'05
- Nielson's Heuristic Evaluation site
  http://www.useit.com/papers/heuristic/

UI Hall of Fame or Shame?

- Dialog box
  - ask if you want to delete



UI Hall of Shame!



- Dialog box
  - ask if you want to delete
- Problems?
  - use of color problematic
    - Yes (green), No (red)
  - R-G color deficiency
  - cultural mismatch
    - Western
      - green good
      - red bad
    - Eastern & others differ

Usability testing

- Learn through observing users
- Ask users to perform certain tasks
  - Don't tell them how to do something, but answer their questions
- Get them to think aloud, ask them to clarify if need be
- Stress that it's the system being tested, not them
- Take notes

Usability testing is not necessarily expensive

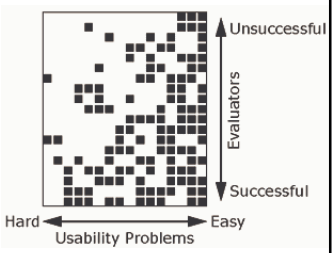
- Can save a lot by catching problems earlier
  - Less wasted effort on unneeded features
  - Avoids having to make large changes to implementation
- Testing takes time
  - Don't want to waste it by having obvious usability bugs get in way of productive user feedback

Heuristic Evaluation

- Developed by Jakob Nielsen
- Helps find usability problems in a UI design
- Small set (3-5) of evaluators examine UI
  - independently check for compliance with usability principles ("heuristics")
  - different evaluators will find different problems
  - evaluators only communicate afterwards
    - findings are then aggregated
- Can perform on working UI or on sketches

Why Multiple Evaluators?

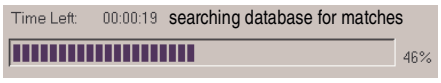
- Every evaluator doesn't find every problem
- Good evaluators find both easy & hard ones



Heuristic Evaluation Process

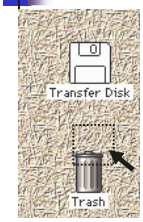
- Evaluators go through UI several times
  - inspect various dialogue elements
  - compare with list of usability principles
  - consider other principles/results that come to mind
- Usability principles
  - Nielsen's "heuristics"
  - supplementary list of category-specific heuristics
    - competitive analysis & user testing of existing products
- Use violations to redesign/fix problems

Heuristics



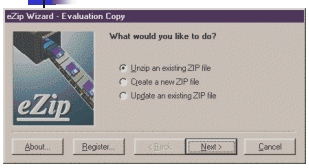
- H2-1: Visibility of system status
  - keep users informed about what is going on
  - example: pay attention to response time
    - 0.1 sec: no special indicators needed
    - 1.0 sec: user tends to lose track of data
    - 10 sec: max. duration if user to stay focused on action
    - for longer delays, use percent-done progress bars

Heuristics (cont.)



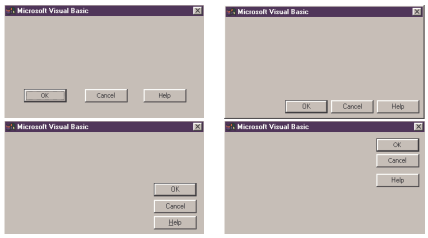
- H2-2: Match between system & real world
  - speak the users' language
  - follow real world conventions
- Bad example: Mac desktop
  - Dragging disk to trash
    - should delete it, *not* eject it

Heuristics (cont.)



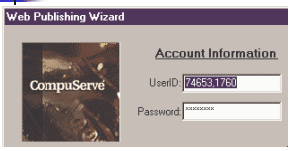
- Wizards
  - must respond to Q before going to next
  - for infrequent tasks
    - (e.g., modem config.)
  - not for common tasks
  - good for beginners
    - have 2 versions (WinZip)
- H2-3: User control & freedom
  - "exits" for mistaken choices, undo, redo
  - don't force down fixed paths

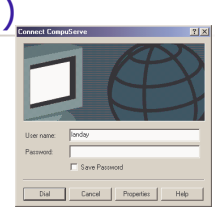
Heuristics (cont.)



- H2-4 Consistency and standards
  - Don't confuse users with different wording
  - Follow platform conventions

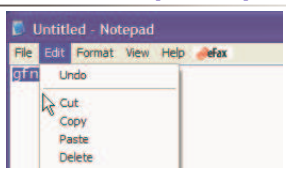
Heuristics (cont.)





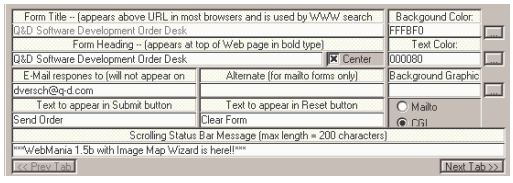
- MS Web Pub. Wiz.
- Before dialing
  - asks for id & password
- When connecting
  - asks again for id & pw
- H2-5: Error prevention
- H2-6: Recognition rather than recall
  - make objects, actions, options, & directions visible or easily retrievable

Heuristics (cont.)



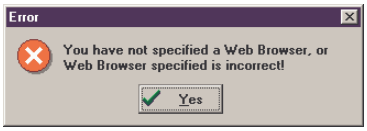
- H2-7: Flexibility and efficiency of use
  - accelerators for experts (e.g., gestures, kb shortcuts)
  - allow users to tailor frequent actions (e.g., macros)

Heuristics (cont.)



- H2-8: Aesthetic & minimalist design
  - no irrelevant information in dialogues

Heuristics (cont.)



- H2-9: Help users recognize, diagnose, & recover from errors
  - error messages in plain language
  - precisely indicate the problem
  - constructively suggest a solution

Heuristics (cont.)

- H2-10: Help and documentation
  - easy to search
  - focused on the user's task
  - list concrete steps to carry out
  - not too large

Phases of Heuristic Evaluation

1) Pre-evaluation training
   - give evaluators needed domain knowledge and information on the scenario
2) Evaluation
   - individuals evaluate and then aggregate results
3) Severity rating
   - determine how severe each problem is (priority)
     - can do this first individually and then as a group
4) Debriefing
   - discuss the outcome with design team

How to Perform Evaluation

- At least two passes for each evaluator
  - first to get feel for flow and scope of system
  - second to focus on specific elements
- If system is walk-up-and-use or evaluators are domain experts, no assistance needed
  - otherwise might supply evaluators with scenarios
- Each evaluator produces list of problems
  - explain why with reference to heuristic or other information
  - be specific and list each problem separately

Examples

- Can't copy info from one window to another
  - violates "Minimize the users' memory load" (H1-3) and "Recognition rather than recall" (H2-6)
  - fix: allow copying
- Typography uses mix of upper/lower case formats and fonts
  - violates "Consistency and standards" (H2-4)
  - slows users down
  - probably wouldn't be found by user testing
  - fix: pick a single format for entire interface

How to Perform H-E

- Why separate listings for each violation?
  - risk of repeating problematic aspect
  - may not be possible to fix all problems
- Where problems may be found
  - single location in UI
  - two or more locations that need to be compared
  - problem with overall structure of UI
  - something that is missing
    - hard w/ paper prototypes so work extra hard on those
    - note: sometimes features are implied by design docs and just haven't been "implemented" – relax on those

Severity Rating

- Used to allocate resources to fix problems
- Estimates of need for more usability efforts
- Combination of
  - frequency
  - impact
  - persistence (one time or repeating)
- Should be calculated after all evals. are in
- Should be done independently by all judges

Severity Ratings (cont.)

0 - don't agree that this is a usability problem
1 - cosmetic problem
2 - minor usability problem
3 - major usability problem; important to fix
4 - usability catastrophe; imperative to fix

Debriefing

- Conduct with evaluators, observers, and development team members
- Discuss general characteristics of UI
- Suggest potential improvements to address major usability problems
- Dev. team rates how hard things are to fix
- Make it a brainstorming session
  - little criticism until end of session

Severity Ratings Example

1. [H2-4 Consistency] [Severity 3][Fix 0]

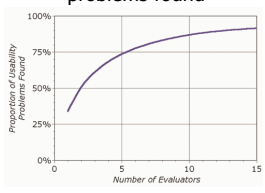
The interface used the string "Save" on the first screen for saving the user's file, but used the string "Write file" on the second screen. Users may be confused by this different terminology for the same function.

HE vs. User Testing

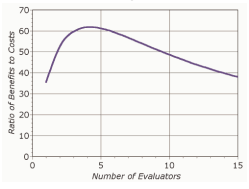
- HE is much faster
  - 1-2 hours each evaluator vs. days-weeks
- HE doesn't require interpreting user's actions
- User testing is far more accurate (by def.)
  - takes into account actual users and tasks
  - HE may miss problems & find "false positives"
- Good to alternate between HE & user testing
  - find different problems
  - don't waste participants

Decreasing Returns

problems found



benefits / cost



- Caveat: graphs for a specific example