Questions?

- Project #2

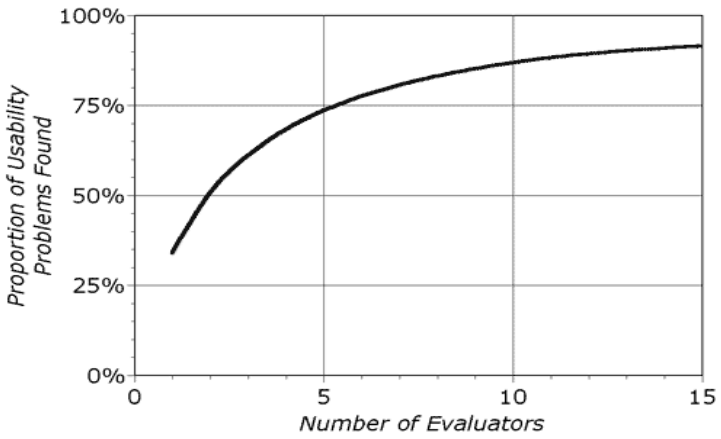
Usability heuristics

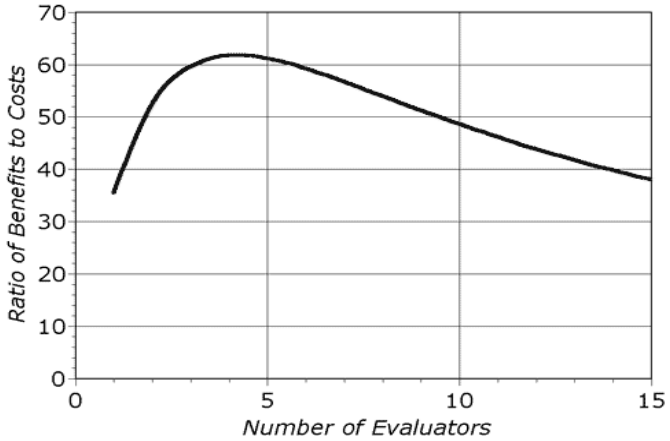
- "Rules of thumb" that describe features of usable systems
  - Can be used as design principles
  - Can be used to evaluate a design

- Pros and cons
  - Easy and inexpensive
    - *Performed by expert*
    - *No users required*
    - *Catch many design flaws*
  - More difficult than it seems
    - *Not a simple checklist*
    - *Cannot assess how well the interface will address user goals*

Usability Engineering

- Introduced by Nielsen (1994)
- Can be performed on working UI or sketches
- Required a small set (3-5) of evaluators to examine the UI
  - Check compliance with usability principles
    - *Each evaluator works independently*
    - *Go through the interface several times*
  - All reviews are aggregated in one final usability report





Nielsen's evaluation phases (1-2)

- Pre-evaluation training
  - Provide the evaluator with domain knowledge if needed

- Evaluation
  - First step: get a feel for flow and scope
  - Second step: focus on specific elements
    - *Multiple passes approach is better*
    - *Create a list of all problems*

Nielsen's evaluation phases (3-4)

- Severity rating
  - Performed after individual evaluations are aggregated
  - Establishes a ranking between problem
  - Reflects frequency, impact and persistence
    - *Cosmetic, minor, major and catastrophic*

- Debriefing
  - Discuss outcome with design team
  - Suggest potential solutions
  - Assess how hard things are to fix

Neilsen’s heuristics

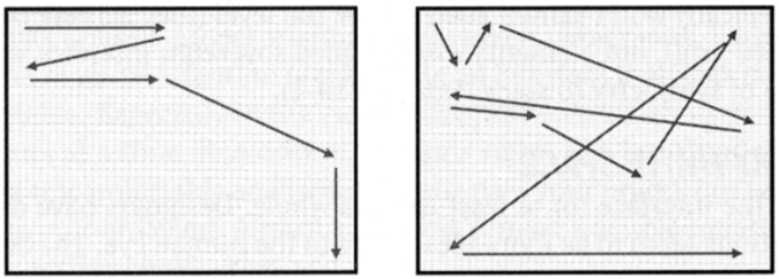
- Simple and natural dialog
- Speak the users’ language
- Minimize user memory load
- Consistency
- Feedback
- Clearly marked exits
- Shortcuts
- Prevent errors
- Good error messages
- Provide help and documentation

Simple and natural dialog

From Cooper’s “The inmates are running the asylum”

Simple and natural dialog

- Present information in natural order



From Cooper's "About face 2.0"

- Use windows frugally
  - Avoid complex window management
- Remove or hide irrelevant or rarely needed information
  - They compete with important information on screen
    - *Pro: Palm Pilot*
    - *Against: Dynamic menus*
- Use Occam's razor
  - less to learn, to get wrong, to distract...

Speak the users’ language

Speak the users' language

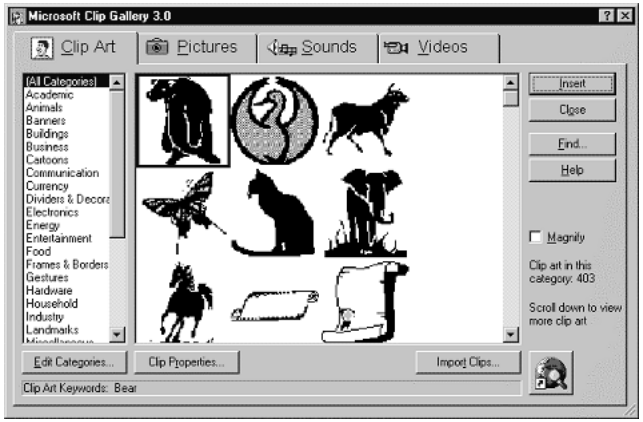
- Use a language compatible with users' conceptual model
  - Example: withdrawing money at an ATM

- Use meaningful mnemonics, icons and abbreviations

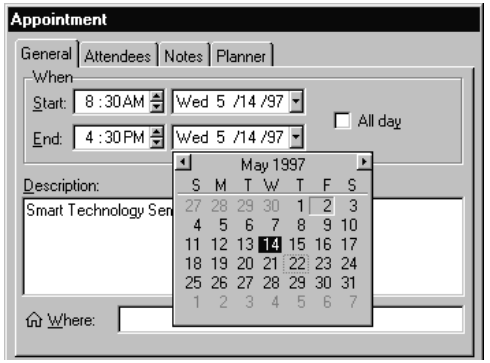
Minimize user memory load

Minimize user memory load

- Promote recognition over recall
  - Recognition is easier than recall



- Describe expected input clearly
  - Don’t allow for incorrect input



- Create orthogonal command systems
  - Using generic commands that can be applied to all interface objects

Consistency

Consistency

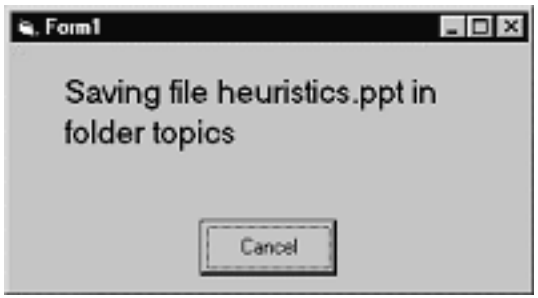
- Consistency promotes skills acquisition and/or transfer

- Be consistent in
  - Command design
    - *Same action, same effect in equivalent situations*
  - Graphic design
    - *Input format*
    - *Output format*
  - Flow design
    - *Similar tasks are handled in similar ways*

Feedback

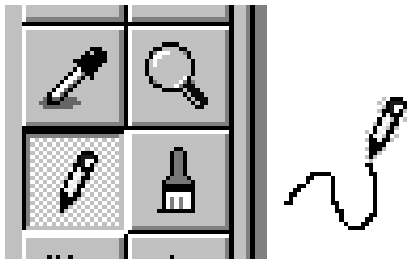
Feedback (Semantic)

- Users should always be aware of what is going on
  - So that they can make informed decision
    - *Be specific*



  - But do not overburden users!

  - Provide redundant information



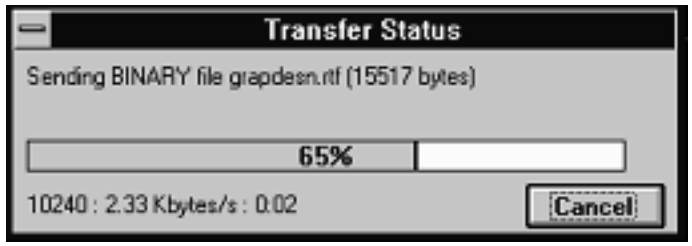
Feedback: Toolbar, cursor, ink

Feedback (Time)

- Different feedback time scales
  - Shall I wait for that task to finished or go for coffee?

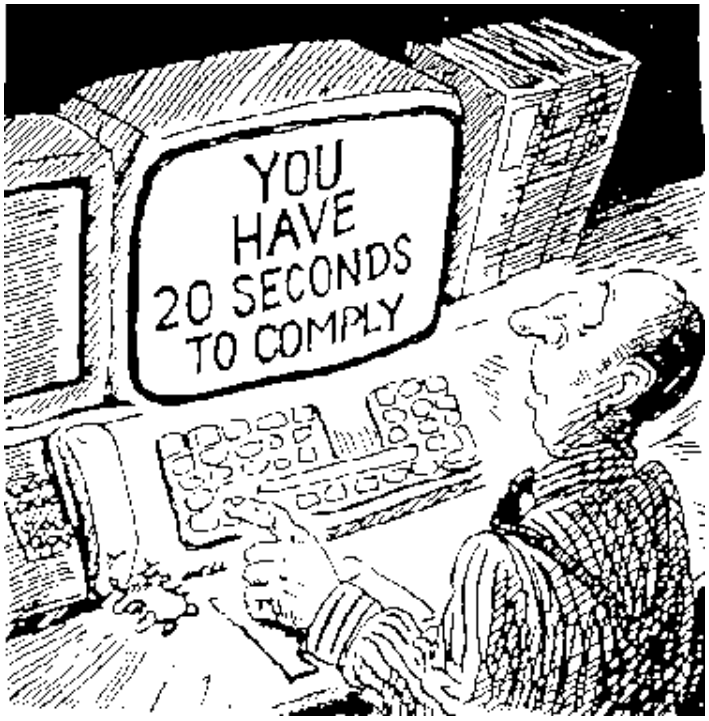
.1s	Causality
1s	Delay but user's flow of thought is uninterrupted
10s	Difficult to stay focused
> 10s	User will switch to another task while waiting

- Different techniques
  - Short transaction: hour glass cursor
  - Longer transaction: estimate of time left
    - *An overestimate is always better!*



Clearly marked exits

- Users don’t like to be trapped!



- Strategies
  - Cancel button (or Esc key) for dialog
    - *Make the cancel button responsive!*
  - Universal undo

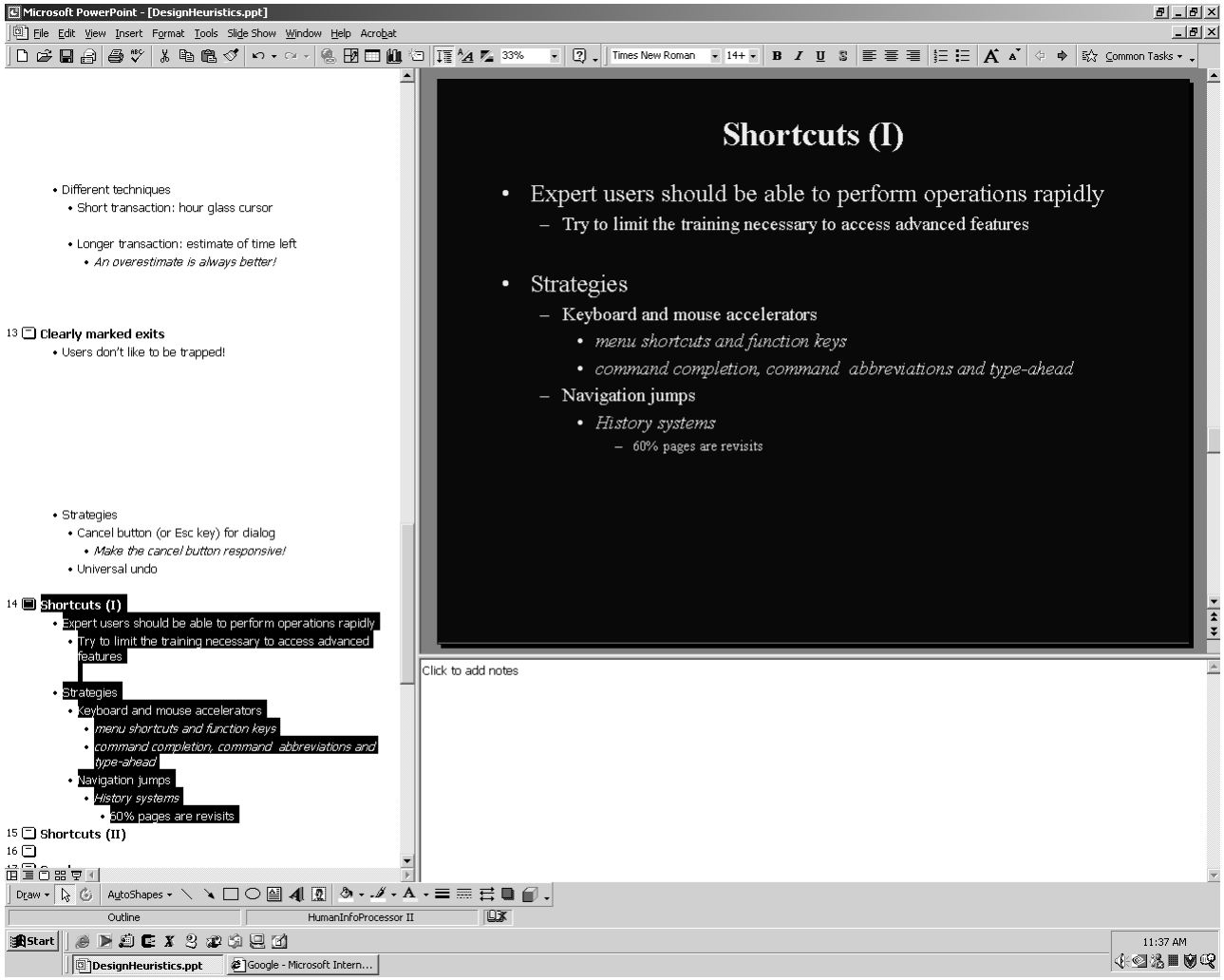
Shortcuts

Shortcuts (I)

- Expert users should be able to perform operations rapidly
  - Try to limit the training necessary to access advanced features

- Strategies
  - Keyboard and mouse accelerators
    - *menu shortcuts and function keys*
    - *command completion, command abbreviations and type-ahead*
  - Toolbars and tool palettes
    - *Trade screen real estate for rapid access*
  - Navigation jumps
    - *History systems*
      - 60% pages are revisits

Shortcuts (II)



Shortcuts: Keyboard accelerators, toolbars, page size scrolling, launch bar…

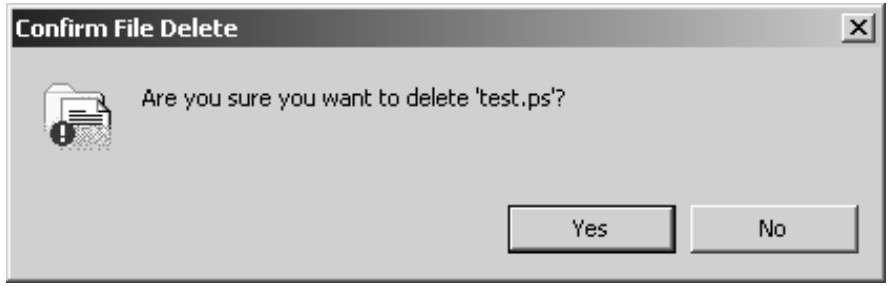
Preventing errors

- Error types
  - Mistakes
    - *Conscious decision with unforeseen consequences*
  - Slips
    - *Automatic behaviors kicking in*
      - Drive to the store, end-up in the office
      - Press enter one time too many…
    - *Mode errors*
      - Forget the mode the application is in
    - *Loss of activation*
      - Forget what your goals were

Designing for slips

One once of prevention is worth more than a pound of cure!

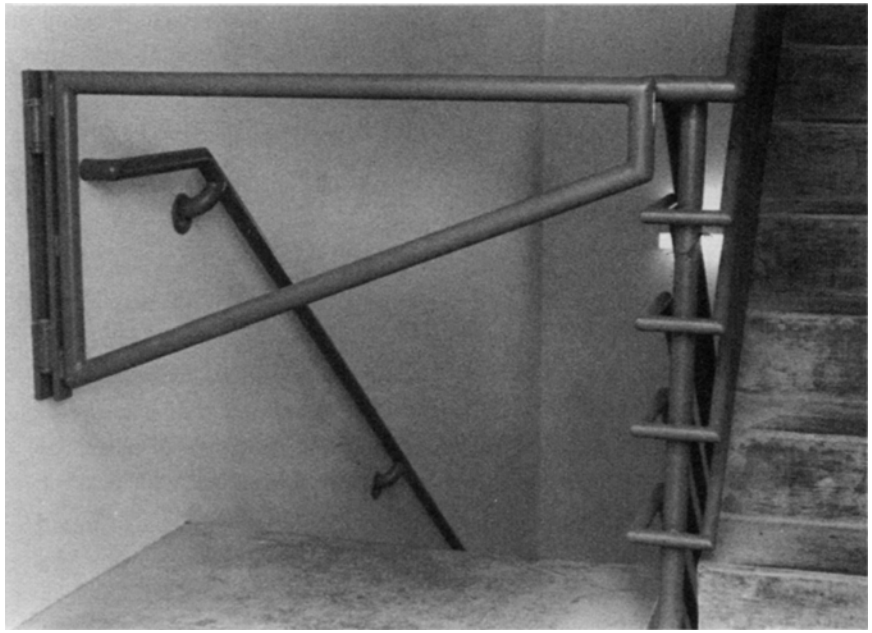
- Examples
  - Design modeless interfaces
  - Instead of confirmations provide undo mechanisms



  - Check for reasonable input
    - *Be prepared to handle several formats*
    - *Make entering a incorrect format impossible*
  - Make the current goal clear
    - *Prevent lost of activations*

Forcing functions

- Interlock mechanisms
  - Switching from P to D in a car
- Lockin mechanisms
  - No eject button for floppy disk on Mac
- Lockout mechanisms
  - Exit stairways



Dealing with errors

- People will make errors!
  - You can ignored them
    - *Generally very confusing*
  - You can correct them automatically
    - *Spelling corrector*
    - *But will I trust the system to be right 100%*
  - You can discuss about it
    - *But novice/expert tradeoff*
  - You can try to teach the user what to do
    - *Office assistant*
- Respect users feelings!

Good error messages

From Cooper's "About Face 2.0"

Good error messages

- Provide meaningful error messages
  - Explain the problem in term or user conceptual model
  - Don’t make the user feel stupid
  - Offer a way to correct the problem

  - Compare
    - *Error 25: access denied*
    - *Cannot open “chapter 5” because “Microsoft Word” is not installed. Do you want to use Notepad instead?*

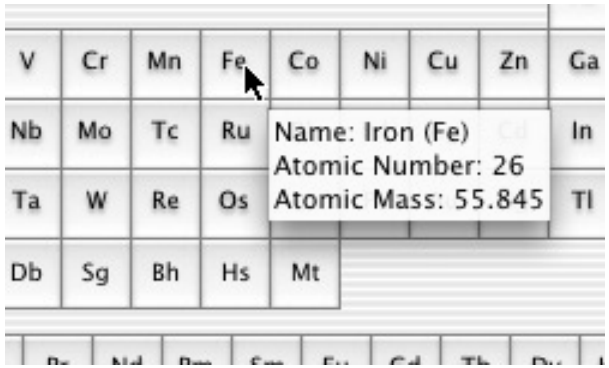
Provide help and documentation

- Providing help is not an excuse for poor design!
  - Saving a couple of line of code or writing several pages of documentation?
  - Users don’t like to read manuals
    - *They prefer to learn while making progress toward their goals*

- Most users will stay at the intermediate level
  - Need reminders and a clear learning path
  - Need a quick way to access critical information
    - *Online documentation and good search tool*

Types of help (I)

- Tutorial and/or getting started manuals
  - Presents the system conceptual model
    - *Basis for successful explorations*
  - Provides on-line tours and demos
    - *Demonstrates basic features*
- Reference manuals
  - Designed with experts in mind
- Reminders
  - Short reference cards, keyboard templates, tooltips…



Types of help (II)

- Wizards
  - Walks user through typical tasks
    - *Users feel they are losing control*
    - *What if I do not have the information requested?*

- Tips
  - Migration path to learning new features
  - Can become boring and tedious

Types of help (II)

- Context sensitive help