

Questions?

Evaluating Without Users

- Cognitive Walkthroughs
 - Task oriented
 - Path through interface pre-determined
 - One analyzer
- Action Analysis
 - KLM
- Heuristic Analysis
 - Interface (not task) oriented
 - Overall examination. Path through interface NOT pre-determined
 - Several analyzers

Cognitive Walkthrough

Requirements:

- Description or prototype of interface
- Task description
- List of actions to complete task
- User background

What you look for:

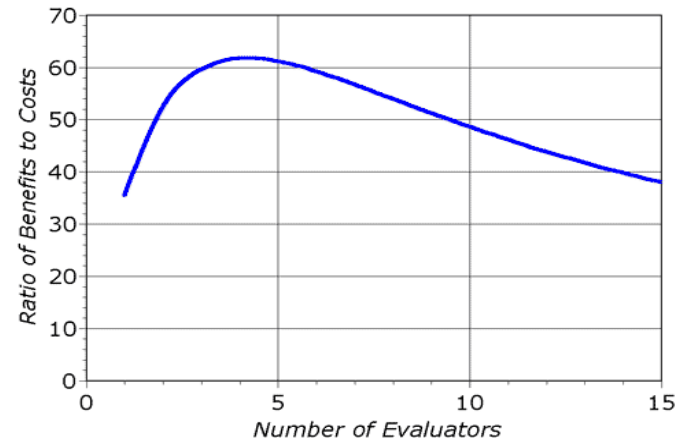
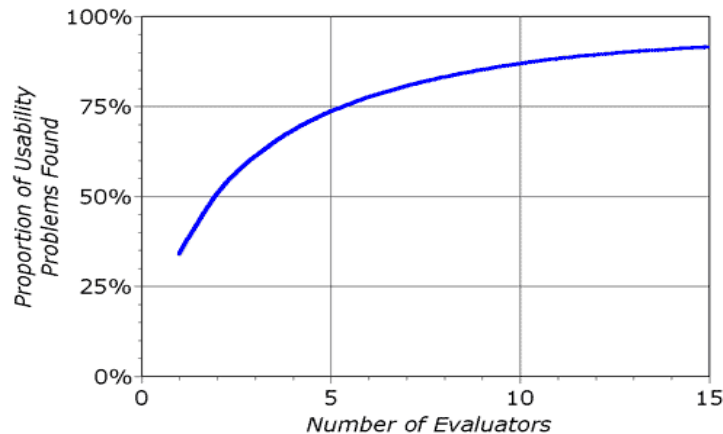
- Will users know to perform the action?
- Will users see the control?
- Will users know the control does what they want?
- Will users understand the feedback?

Heuristic Analysis

- “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*
 - *Catches 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
- Requires a small set of evaluators to examine the UI
 - Check compliance with usability principles
 - *Each evaluator works independently*
 - *Go through the interface several times with different perspectives*
 - 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 is better*
 - *Create a list of all problems*
 - *Rate severity of problem*

Nielsen's evaluation phases (3-4)

- Severity rating
 - Performed by individuals
 - Then aggregated by group
 - 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

Evaluation Aggregation

	A	B	C	D
1	Machine 6 - Zoomable			
	Severity (1-Low => 5-High)	Average Severity	Count	Description
3	-,4,5	4.0	3	Color of review & cast ballot buttons should be different than progress indicator
4	-	3.0	1	Not clear how to get started
5	?	3.0	1	Feels like a game - possibly inappropriate
6	-	3.0	1	"Not voted" confusing when multiple choices available
7	-	3.0	1	Peripheral races too visually confusing
8	1,4	2.5	2	Progress/navigation buttons is partly a progress indicator, but not clear enough
9	2	2.0	1	Overview buttons shouldn't split 4 sub-types

Nielsen'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

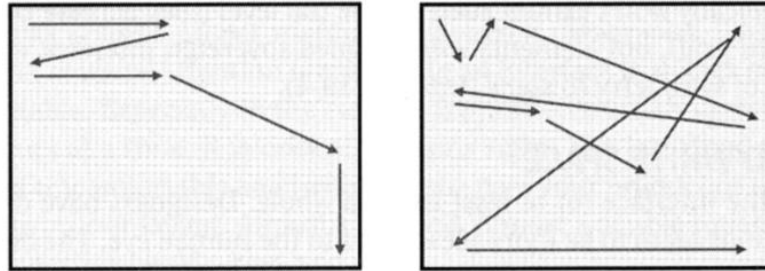
Simple and natural dialog



From Cooper's "The inmates are running the asylum"

Simple and natural dialog

- Present information in natural order

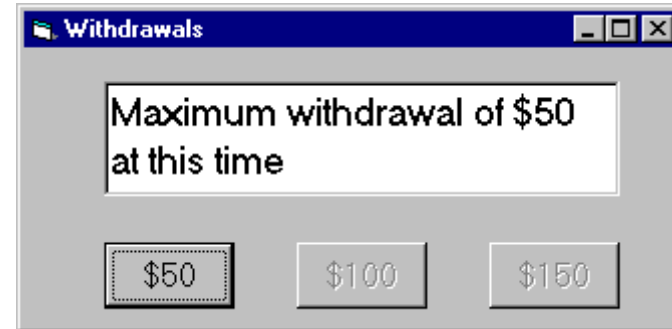
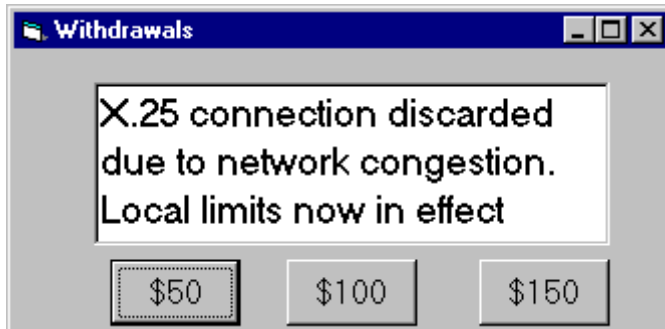


From Cooper's "About face 2.0"

- Simple is good
 - Remove or hide irrelevant or rarely needed information
 - *They compete with important information on screen*
 - Pro: Palm Pilot
 - Against: Dynamic menus
 - Use windows frugally
 - *Avoid complex window management*

Speak the users' language

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



- Use meaningful mnemonics, icons and abbreviations

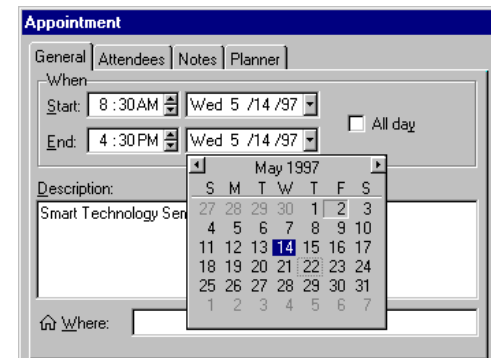


Minimize user memory load

- 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

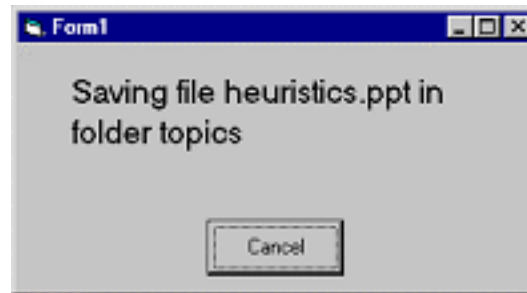
Consistency

- 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*
- Consistency promotes skills acquisition and/or transfer

Feedback (Semantic)

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

- *Be specific*



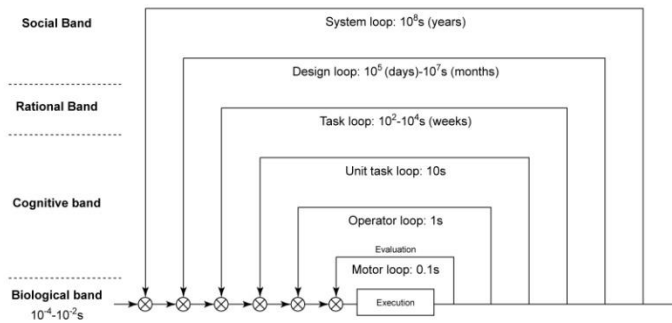
- But do not overburden users!
- Provide redundant information



Feedback: Toolbar, cursor, ink

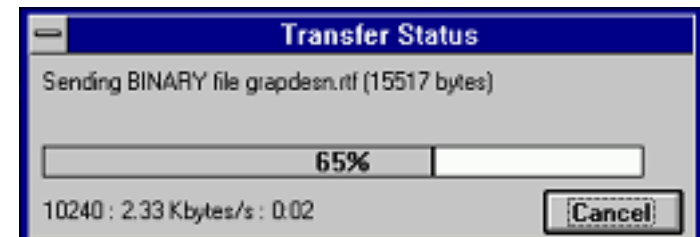
Feedback (Time)

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



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

- 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 (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)

13-14 - Usability Heuristics [Compatibility Mode] - Microsoft PowerPoint

Home Insert Design Animations Slide Show Review View Acrobat

Paste Copy Format Painter New Slide Delete Clipboard Slides

Font Paragraph Drawing Editing

Slides Outline

17 Feedback (1)

18 Clearly marked exits

19 Shortcuts (I)

20 Shortcuts (II)

21 Phrasing errors

22 Debugging for error

23 Phrasing functions

24 Skating with error

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Custom Animation

Add Effect Remove

Modify effect

Start: Property: Speed:

- Keyboard and mouse a...
- menu shortcuts and fu...
- command completion, ...
- Toolbars and tool palet...
- Trade screen real esta...
- Navigation jumps
- History systems
- 60% pages are revisits

Re-Order Play Slide Show AutoPreview

Slide 19 of 32 HumanInfoProcessor II 100%

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

Preventing errors

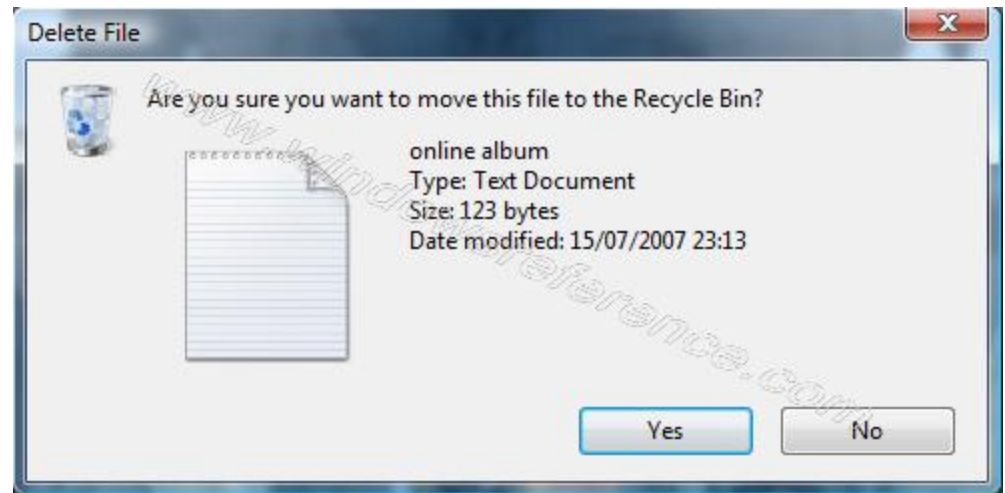
- Error types
 - Mistakes
 - *Conscious decision with unforeseen consequences*
 - Slips
 - *Automatic behaviors kicking in*
 - Drive to the store, end-up in the office
 - Press enter one time too many...
 - *Mode errors*
 - Forget the mode the application is in
 - *Loss of activation*
 - Forget what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

Designing for slips

An ounce 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
 - Require step A before step B can be performed
 - Ex: Switching from P to D in a car requires pressing brake pedal
- Lockin mechanisms
 - Process continues unless user removes constraint before stopping it
 - Ex: No eject button for floppy disk on Mac
- Lockout mechanisms
 - Process won't occur unless user removes constraint before starting it
 - Ex: Basement stairway

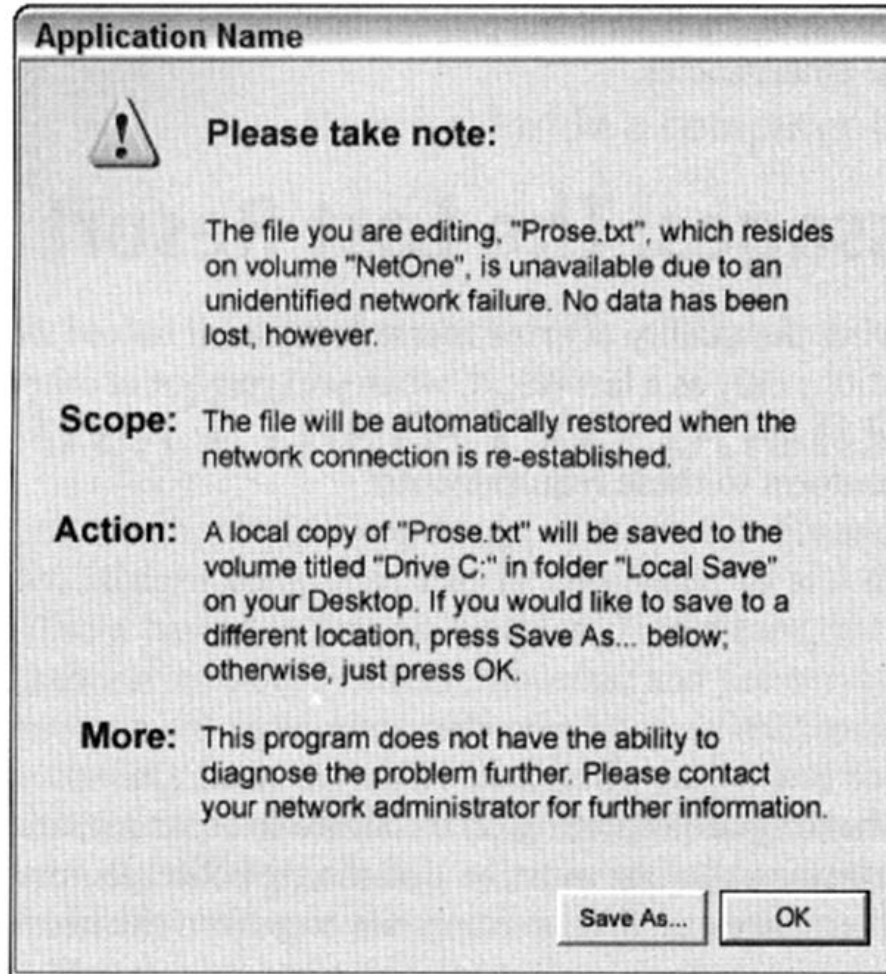


Questions

Dealing with errors

- People will make errors!
 - You can ignore them
 - *Generally very confusing*
 - You can correct them automatically
 - *Spelling corrector*
 - *But is the system right 100% of the time?*
 - You can discuss it
 - *But novice/expert tradeoff*
 - You can try to teach the user what to do
 - *Office assistant*
- Respect users feelings!
 - The user is never wrong

Good error messages



From Cooper's "About Face 2.0"

Good error messages

- Provide meaningful error messages
 - Explain the problem in terms of the user conceptual model
 - Don't make the user feel stupid
 - Offer a way to correct the problem

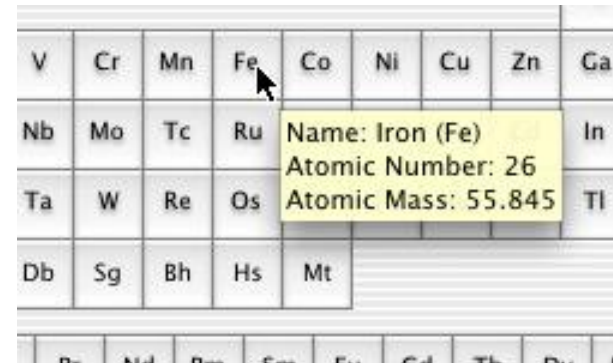
 - Compare
 - *Error 25: access denied*
 - *Cannot open "chapter 5" because "Microsoft Word" is not installed. Do you want to use Notepad instead?*

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...
- “Show me” videos



A screenshot of a periodic table with a tooltip for the element Iron (Fe). The tooltip displays the following information:

V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga
Nb	Mo	Tc	Ru	Name: Iron (Fe) Atomic Number: 26 Atomic Mass: 55.845				In
Ta	W	Re	Os					Tl
Db	Sg	Bh	Hs	Mt				

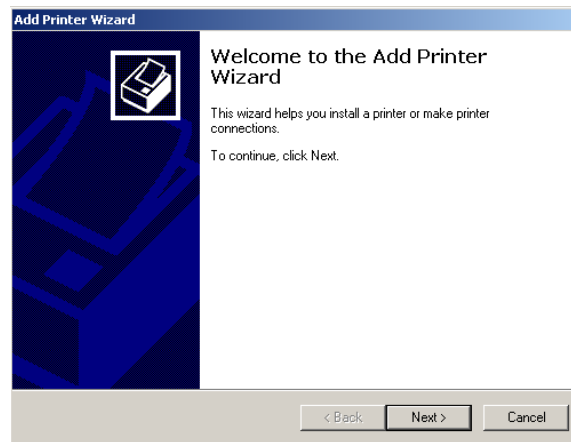
Types of help (II)

- Wizards

- Walks user through typical tasks

- *Users feel they are losing control*

- *What if I do not have the information requested?*



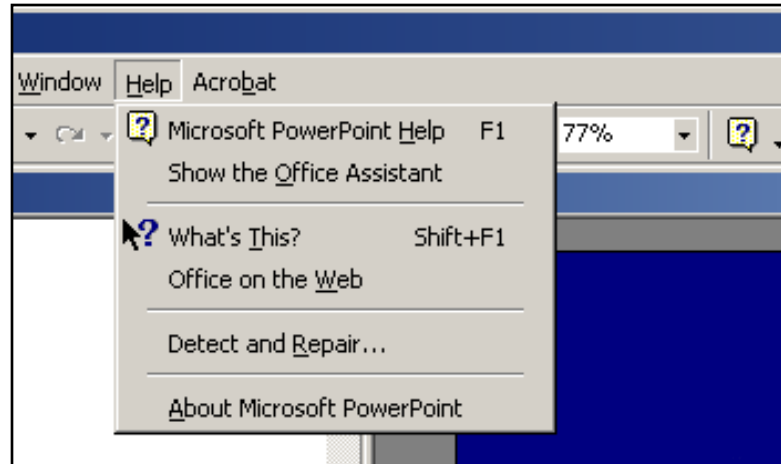
- Tips

- Migration path to learning new features

- Can become boring and tedious

Types of help (II)

- Context sensitive help



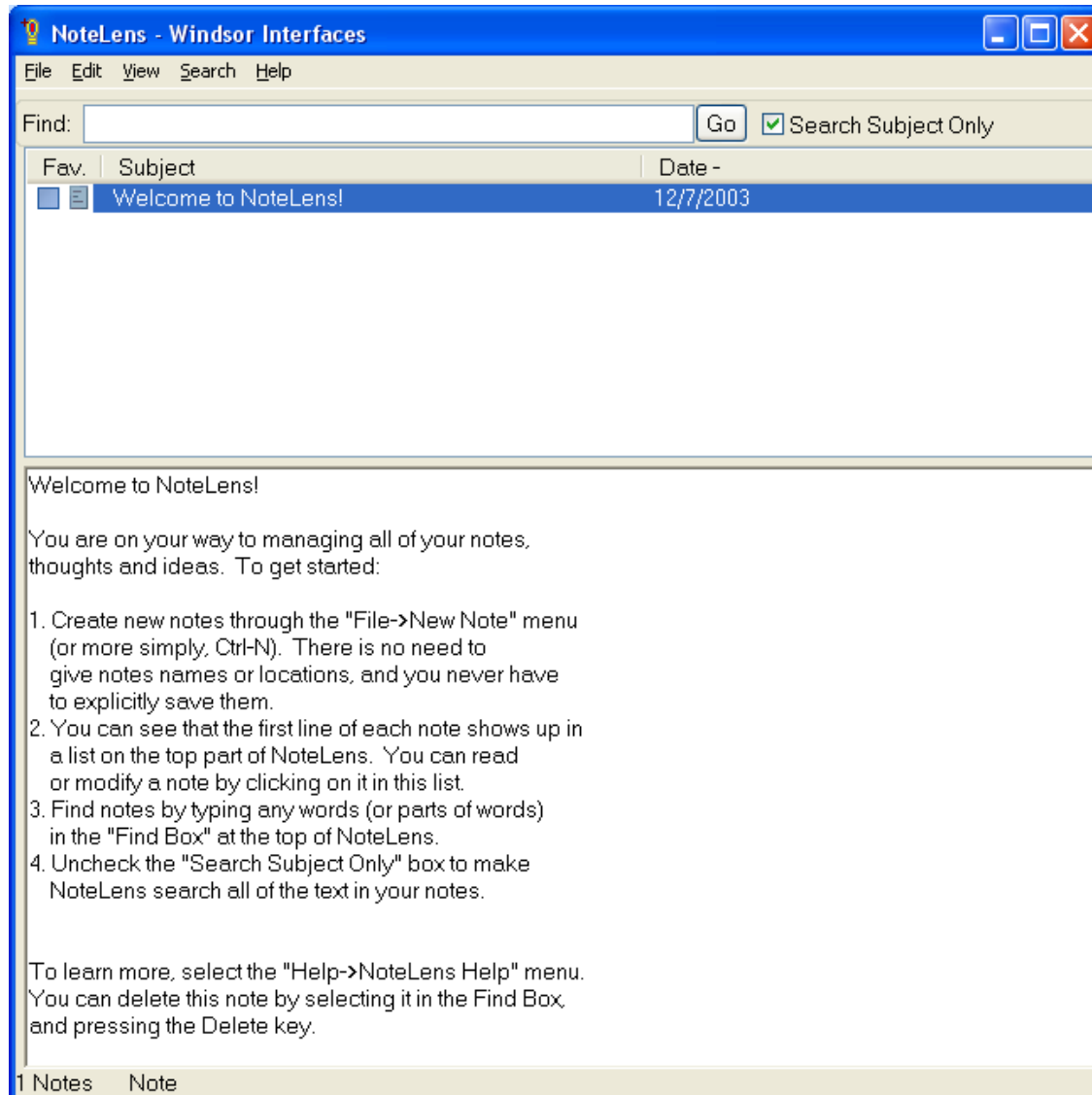
Shneiderman's "Golden Rules"

- Strive for consistency
- Cater to universal usability
- Offer informative feedback
- Design dialogs to yield closure
- Prevent errors
- Permit easy reversal of actions
- Support internal locus of control
- Reduce short-term memory load

Flow

- Challenge and require skill
- Concentrate and avoid interruption
- Maintain control
- Speed and feedback
- Transformation of time
 - What is RSD?

Example: NoteLens



Example: EverNote

The screenshot shows the Evernote application window titled "Main - bederson - Evernote". The interface includes a menu bar (File, Edit, View, Note, Tools, Help), a toolbar with icons for Synchronize, Current Monthly Usage, New Note, All Notes, Attributes, Email, Print, Tag, and Delete, and a search bar containing "directions".

The main content area displays a list of notes with columns for Creation Date, Title, Tags, and Notebook. The notes are sorted by creation date, with the most recent at the top.

Creation Date	Title	Tags	Notebook
3/28/2008 3:38 PM	Temple Membership Committee Meeting 10/4/04		Main
3/28/2008 3:38 PM	Temple Membership Committee Meeting 9/5/04		Main
3/28/2008 3:38 PM	Recipe - Ralph's Marinara Sauce (Tomato sauce) from Anne SanGiovanni		Main
3/28/2008 3:38 PM	Directions to UMD		Main
3/28/2008 3:38 PM	Directions from Green Acres to Union Station		Main
3/28/2008 3:38 PM	HCIL HowTo Directions - including restart		Main
3/28/2008 3:38 PM	ICDL HowTo Directions - including restart and website registrations		Main
3/28/2008 3:38 PM	Directions to Windsor, MA		Main
3/30/2008 10:42 PM	Directions to 7017 W. Greenvale Parkway		Main
1/4/2009 10:03 AM	Recipe - Pancakes		Main

Two notes are expanded to show their content:

Directions to UMD (Created 3/28/2008 3:38 PM)

file:///C:/temp/notes-store/note415.txt

Click to edit tags

Directions to UMD Hornbake

Go East on I-495 toward Baltimore. Take Exit 25 (U.S. 1 South toward College Park). Proceed approximately two miles south on U.S. Route 1. Turn right into Campus Drive. At the big "M" rotary, make your first right onto Regents Drive. Make your first left into a service road. It immediately bends left behind a building, and you can wait in one of the service parking spots next to the dumpster.

Directions from Green Acres to Union Station (Created 3/28/2008 3:38 PM)

file:///C:/temp/notes-store/note423.txt

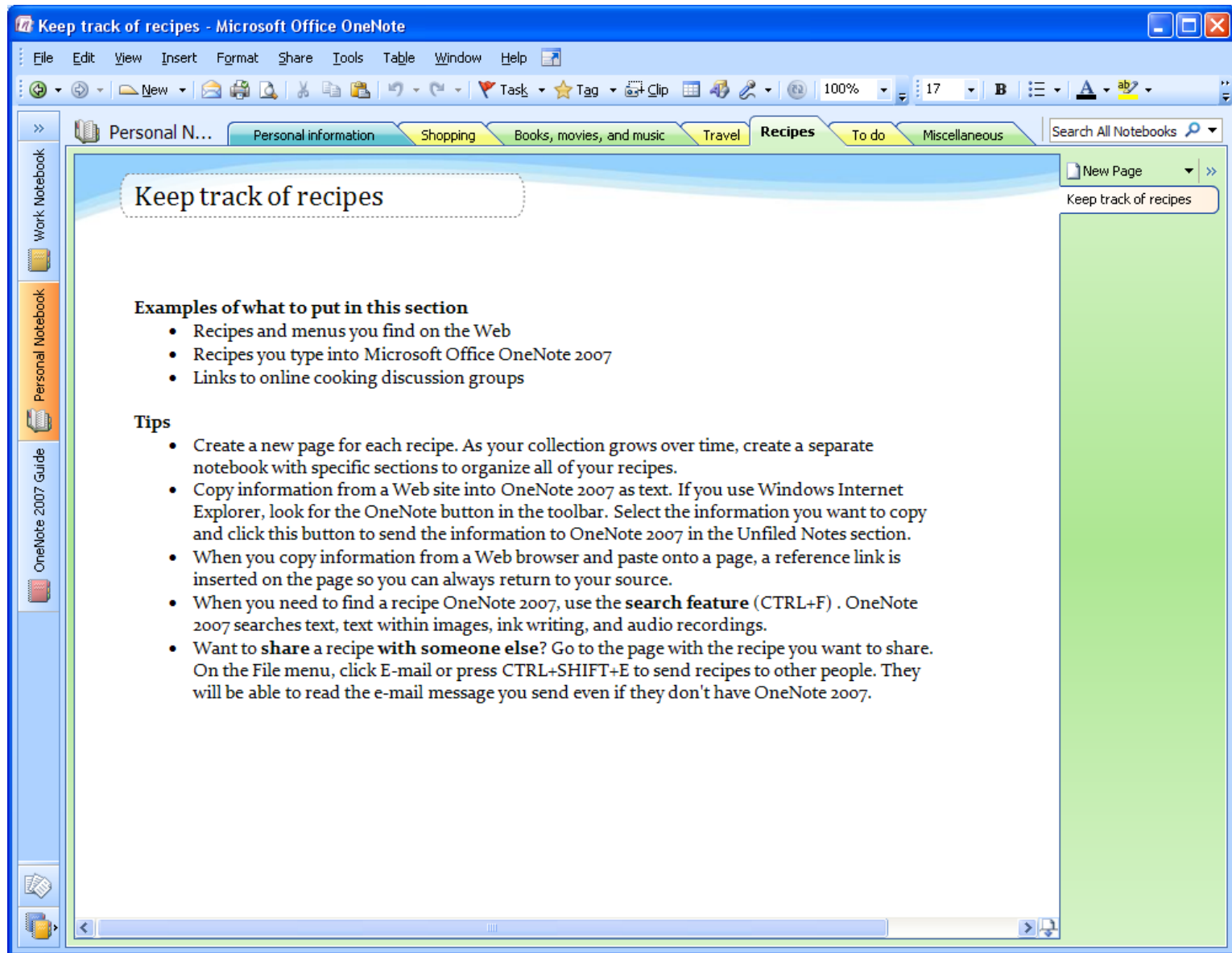
Click to edit tags

Directions from Green Acres to Union Station

- 1/2 mi Beltway to Connecticut
- 1/2 mi Exit 33 Connecticut South
- 1/2 mi Continue on Connecticut around Chevy Chase Circle
- 1/2 mi ~0.5 miles, Left on Military Road
- 1/2 mi Continue through park, cross 16th St.

The right sidebar shows a calendar view for 3/28/2008, with a vertical scroll bar. The bottom status bar indicates "Notes selected: 1 of 10" and "Next sync at 1:23 PM".

Example: OneNote



Exercise: Heuristic Evaluation

Find fastest way to get from campus to Silver Spring metro station along with cost.

www.wmata.com