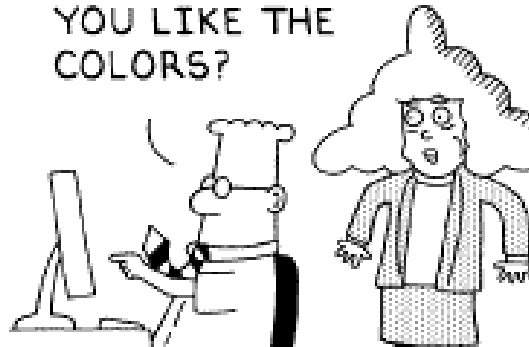


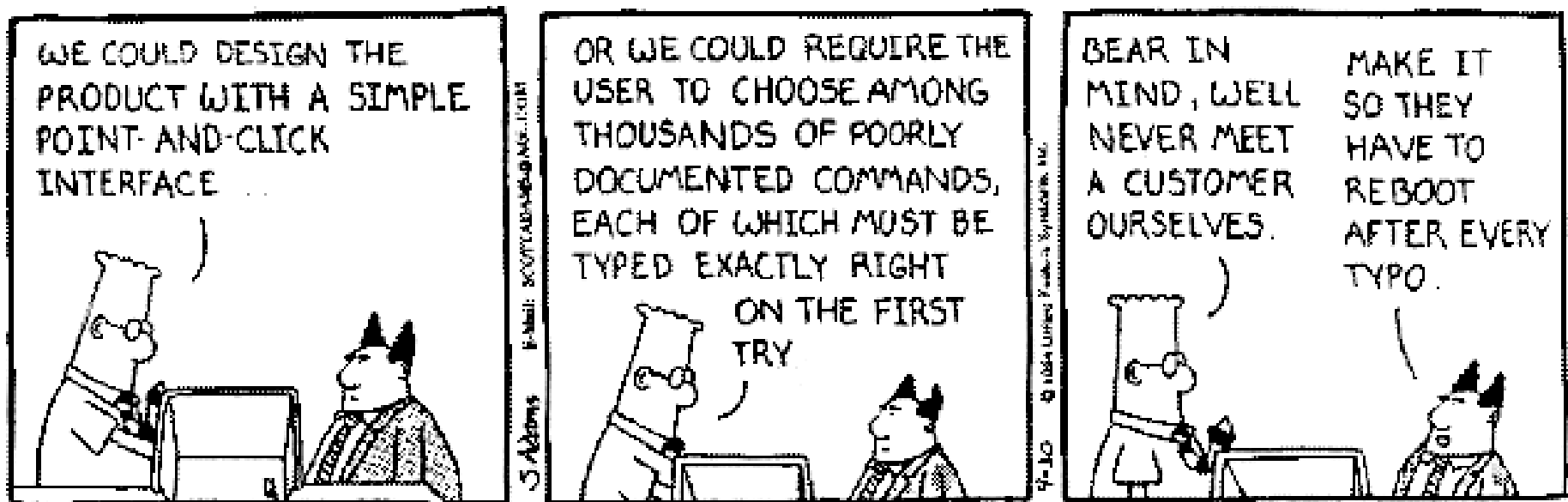
UI Requirements and Design

I DESIGNED THE
USER INTERFACE
MYSELF. HOW DO
YOU LIKE THE
COLORS?



Usability and software design

- **usability**: the effectiveness with which users can achieve tasks in one software environment
 - Studying and improving usability is part of Human-Computer Interaction (HCI).



Good UI design and usability

- Usability and good UI design are closely related.
- A bad UI can have unfortunate results...



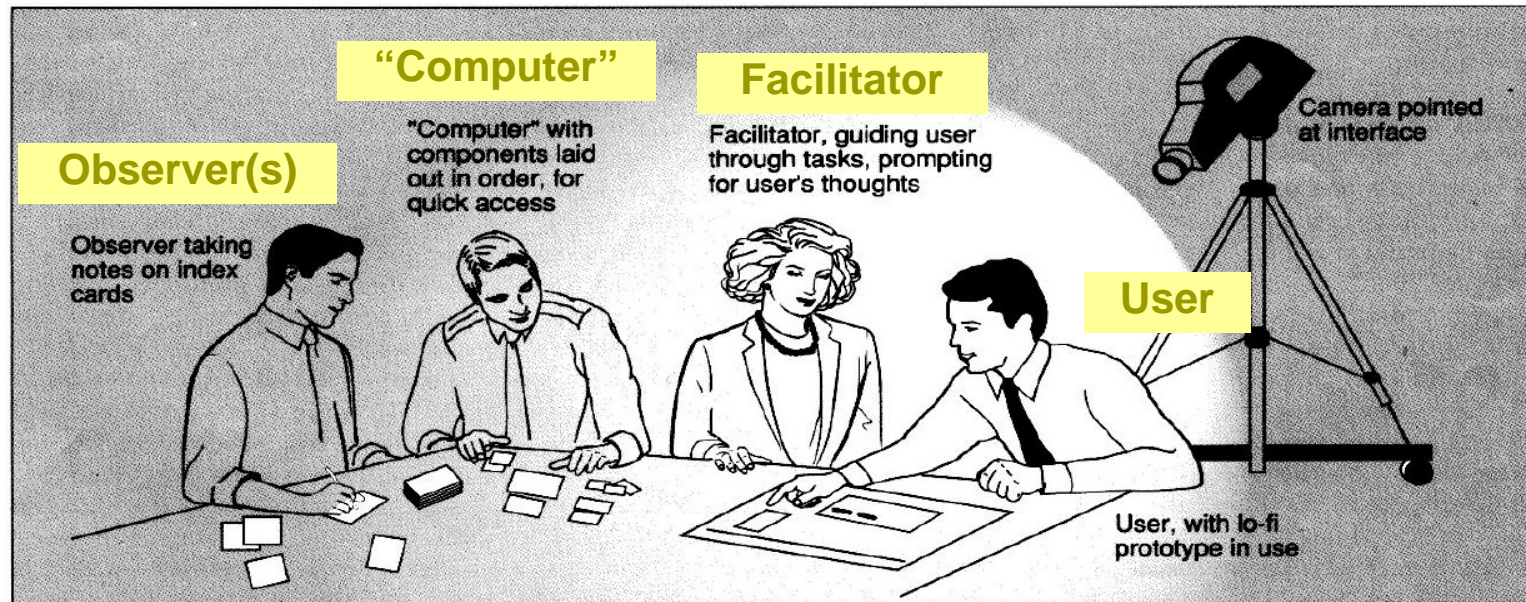
Achieving usability

- Some methods to achieve good usability are:
 - User testing / field studies
 - Evaluations and reviews by UI experts
 - Prototyping
 - Paper prototyping, code prototyping

Good UI design focuses on the *user*,
not on the developer or on the system
environment

Paper prototyping

paper prototyping: a means of usability testing where representative users perform tasks by interacting with a paper version of a user interface



Why prototype on paper?

- Why not just code up a working prototype?

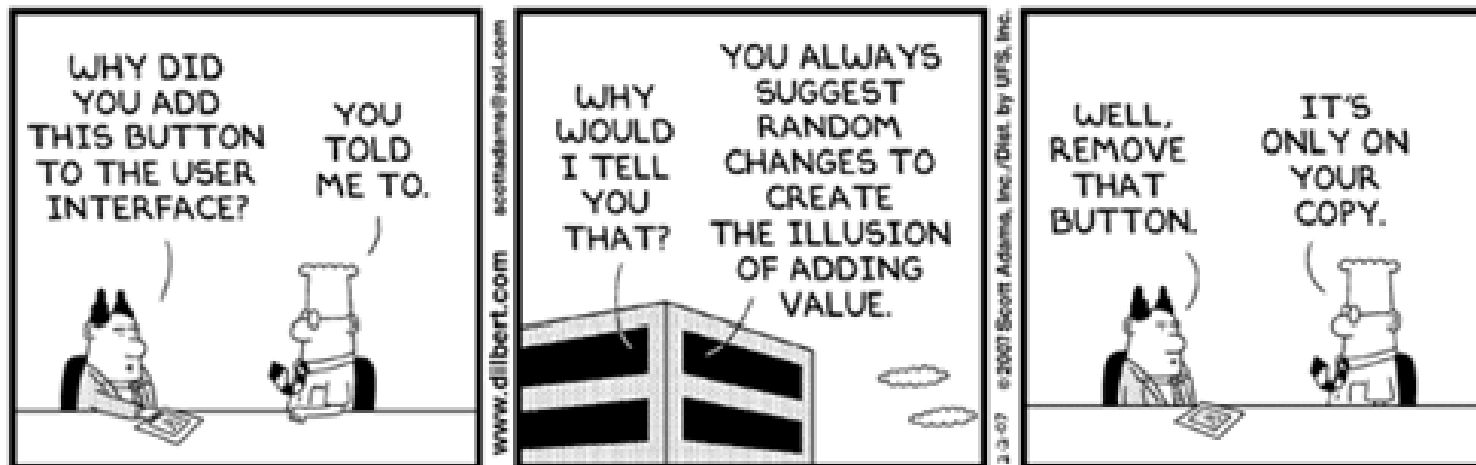
Spring 08 says:

- Faster to use paper to get an initial prototype out
- Easier to change, to experiment with
- Encourages feedback, as users don't feel like it's a big deal to change at this time
- Focuses feedback on big things vs small (like the font)
- Self documenting; can springboard from the paper description to an implementation
- Implementation neutral
- Allows the user to drive the design

Comparison of techniques

	paper prototype	UI builder	actual implementation
ease of use			
fast turn-around			
flexibility, control			
executable			
team design			

Let's move into UI design...



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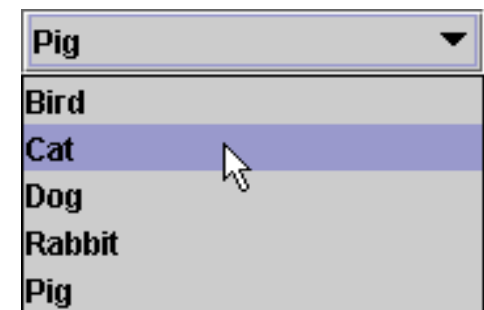
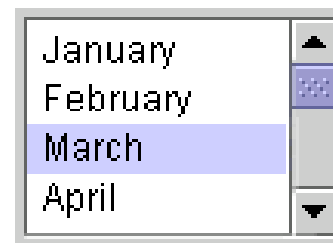
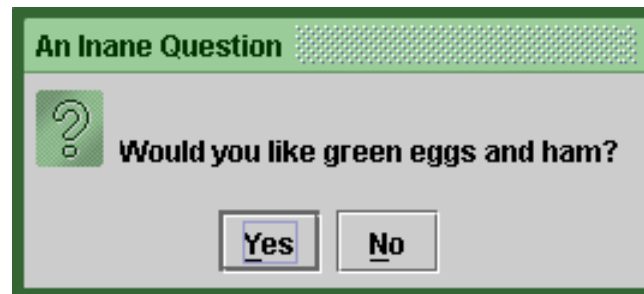
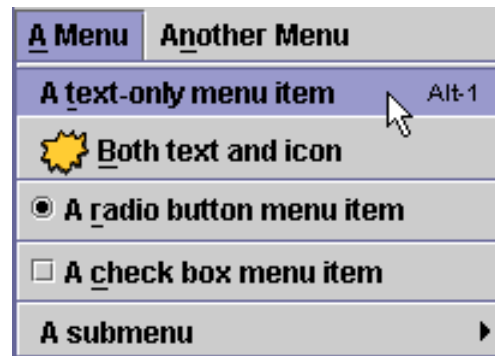
CSE 403, Spring 2008

(from *Designing the User Interface*, by Ben Schneiderman of UMD, noted HCI/UI design expert)

UI design

- When should we use:

- A button?
- A check box?
- A radio button?
- A text field?
- A list?
- A combo box?
- A menu?
- A dialog box?
- Other...?



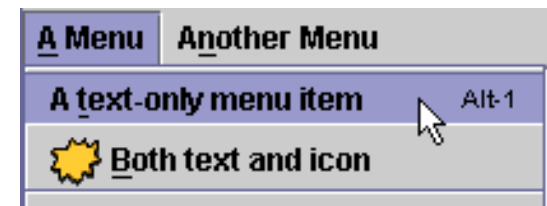
UI design - buttons, menus

- Use **buttons** for single independent actions that are relevant to the current screen.

- Use **toolbars** for common actions.

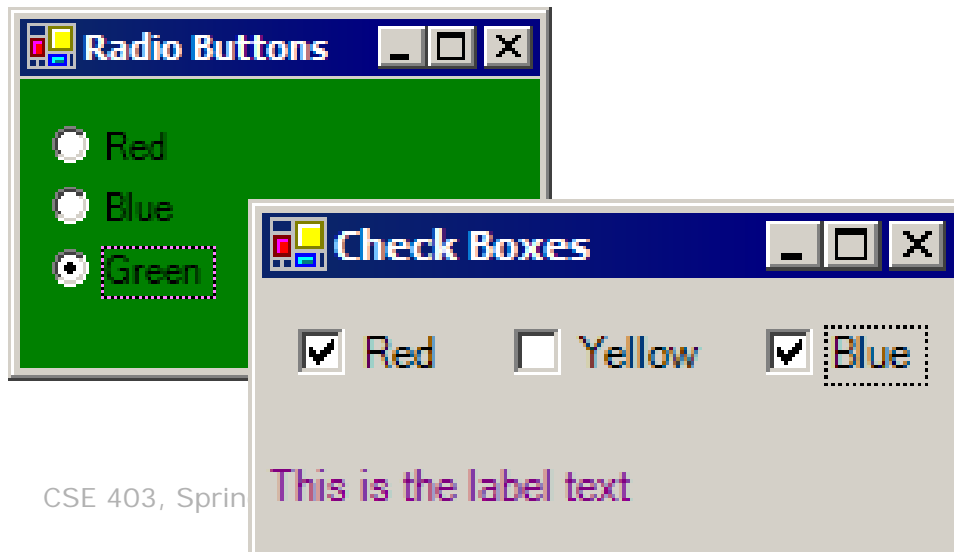


- Use **menus** for infrequent actions that may be applicable to many or all screens.

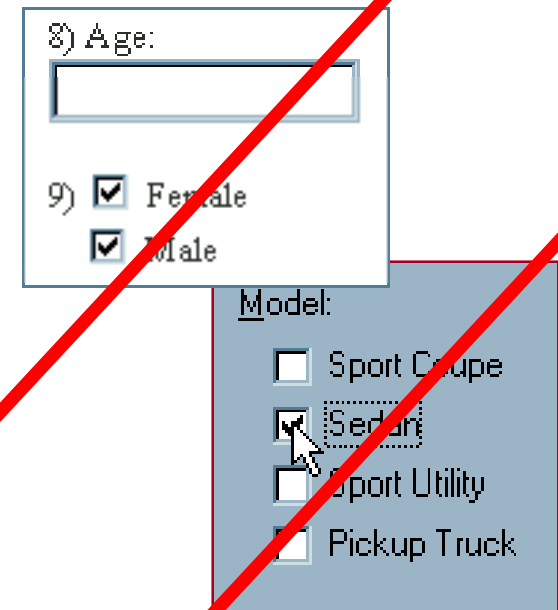


Checkboxes, radio buttons

- Use **check boxes** for on/off switches, when any one switch can be toggled irrespective of the others (often correspond to boolean values).
- Use **radio buttons** for related choices, when only one choice can be activated at a time (often corresponds to enum / constant values).



CSE 403, Spring



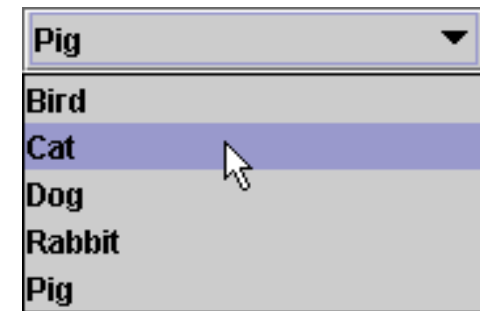
Lists, combo boxes

- use **text fields** (usually with a label) when the user may type in anything they want
- use **lists** when there are many fixed choices (too many for radio buttons to be practical) and you want *all* choices visible on screen at once
- use **combo boxes** when there are many fixed choices, but you don't want to take up screen real estate by showing them all at once (scroll)



Years:

A text field with the label "Years:" and the value "30".



Pig
Bird
Cat
Dog
Rabbit
Pig

A list with a dropdown arrow on the left. The list contains the items: Pig, Bird, Cat, Dog, Rabbit, Pig. The "Cat" item is highlighted with a mouse cursor pointing to it.



January
February
March
April

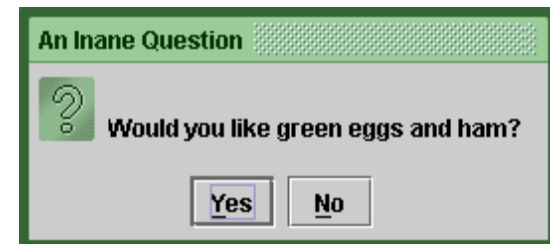
A combo box with a scroll bar on the right. The list contains the items: January, February, March, April. The "March" item is highlighted.

UI design - multiple screens

- use a **tabbed pane** when there are many screens that the user may want to switch between at any moment

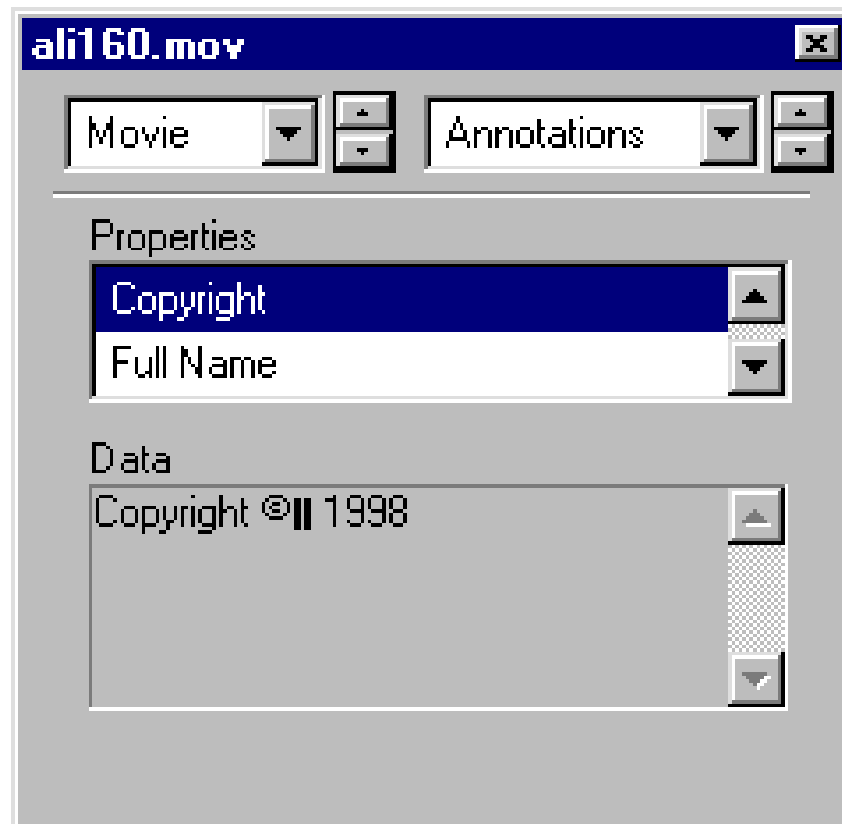


- use **dialog boxes** or **option panes** to present temporary screens or options



An example UI

- What can we say about this GetInfo dialog? Did the designer choose the right components? Assume 30 properties.



How about this one

Installation Wizard for Visual Studio 6.0 Enterprise Edition

The Installation Wizard has detected an out of date version of Internet Explorer. Visual Studio comes with the latest version of Internet Explorer 4.01. This updated version of Internet Explorer 4.01 is an essential component of Visual Studio 6.0 Enterprise Edition and installation is required.

Install IE 4.01 (4.72.3110.8)

When you click on the Next button the Internet Explorer 4.01 installation program will start. Installation of Internet Explorer 4.01 requires you to reboot your computer.

Click Next to install Internet Explorer 4.01.

< Back

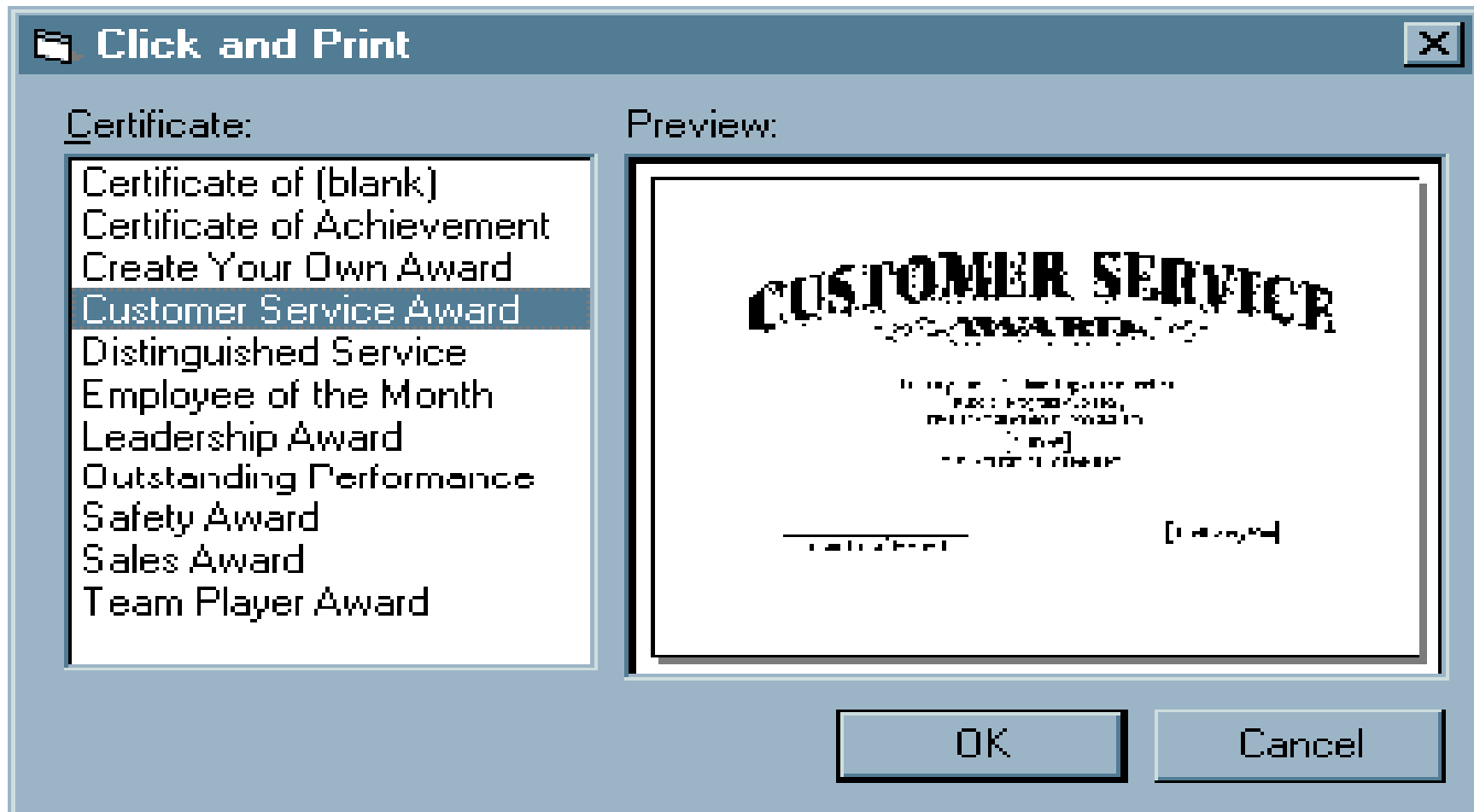
Next >

Exit

One more to analyze



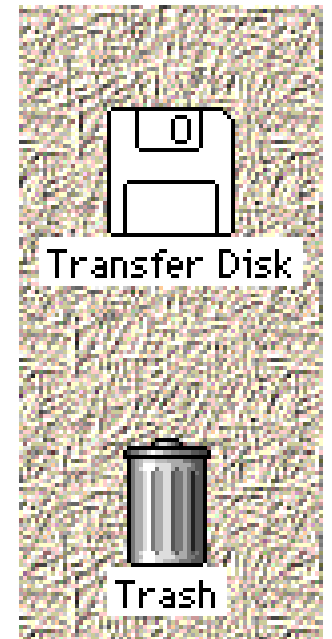
Better



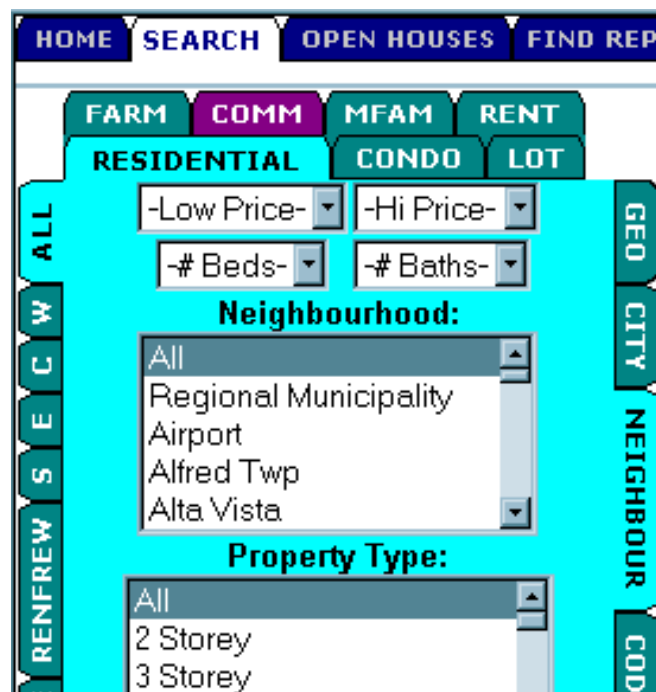
Good UI: Apple Mac



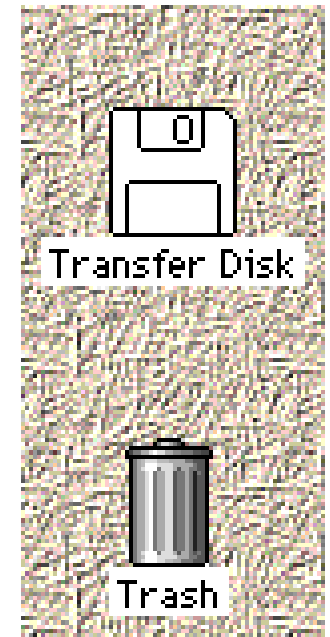
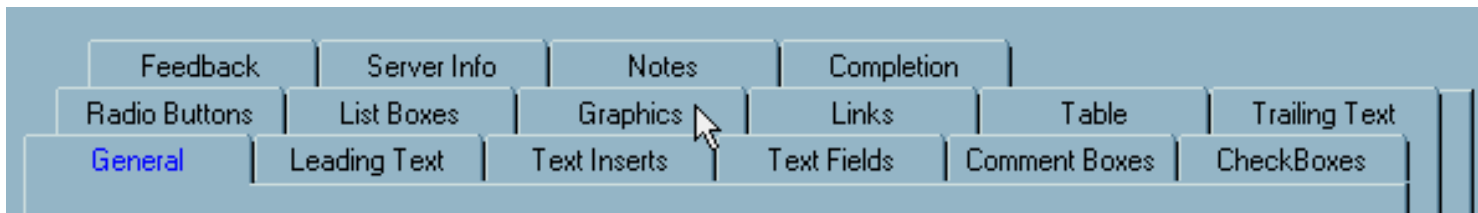
Poor UI



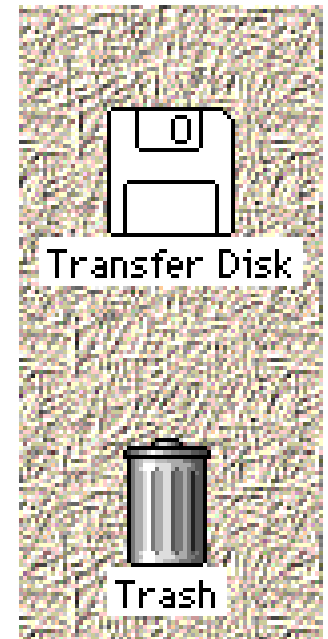
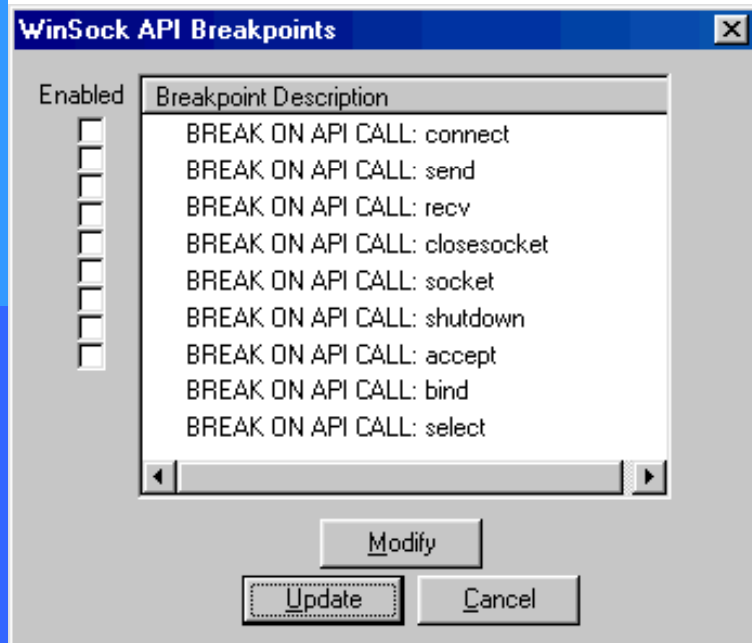
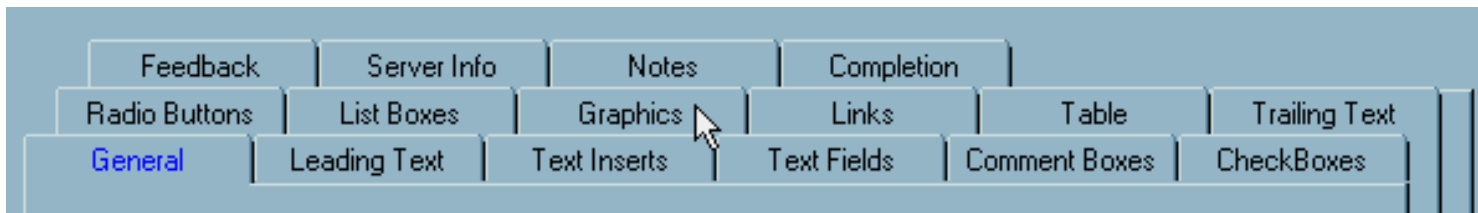
Poor UI



Poor UI



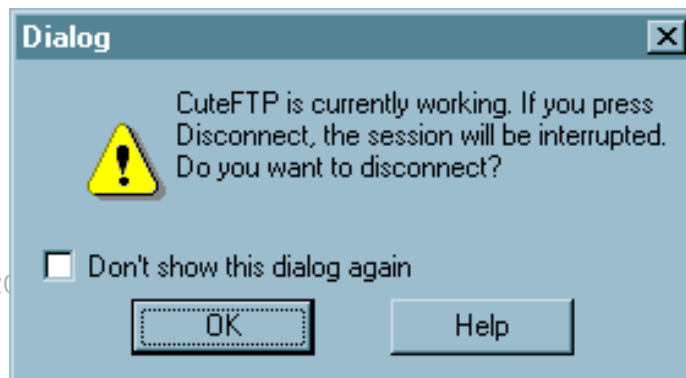
Poor UI



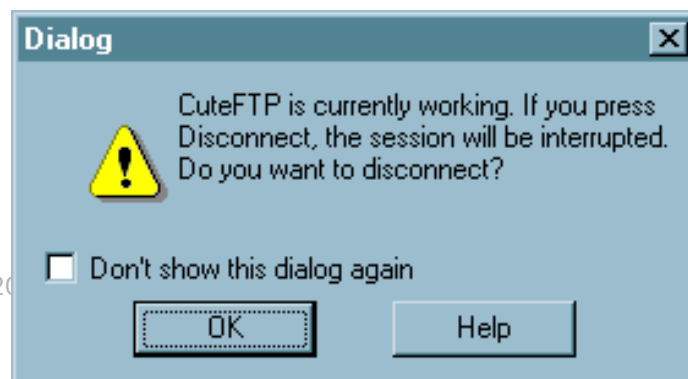
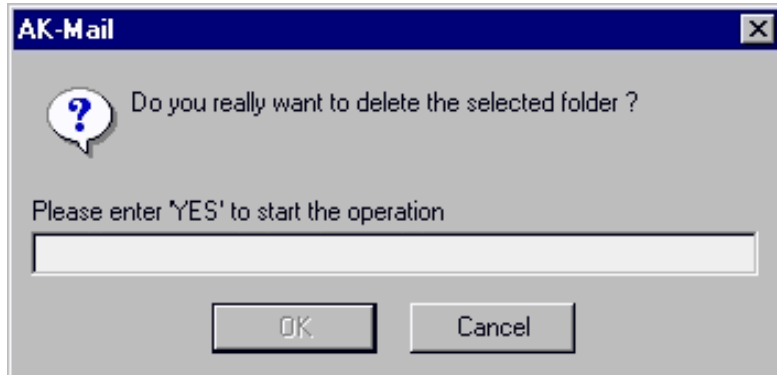
Bad error messages



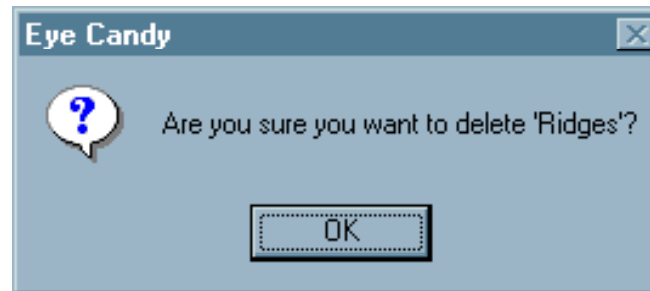
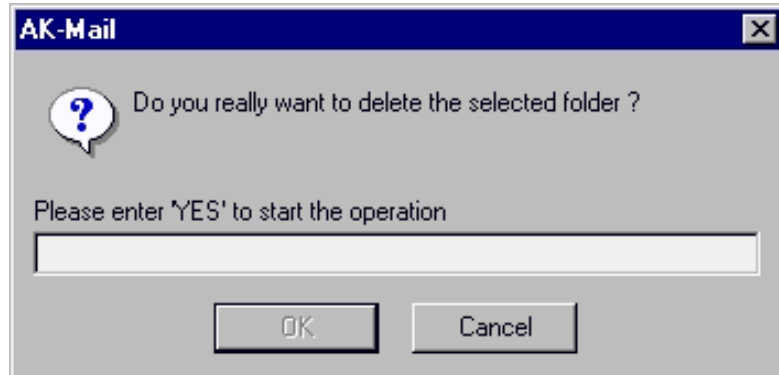
Bad error messages



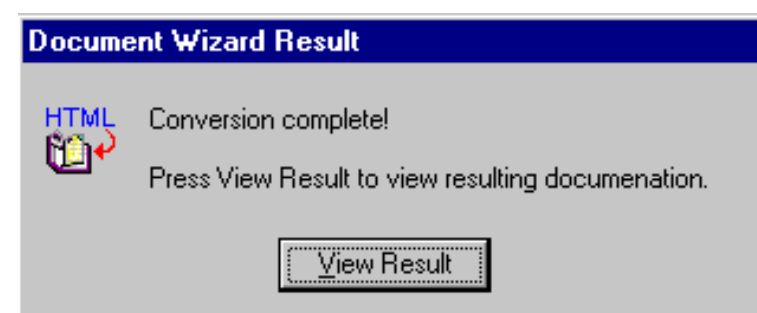
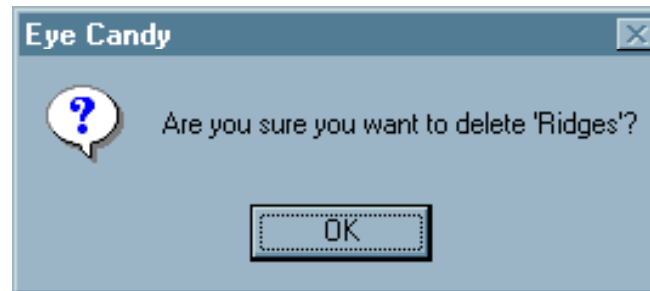
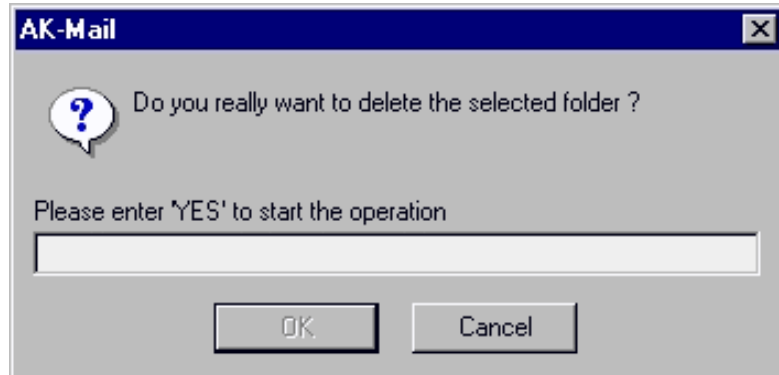
Bad error messages



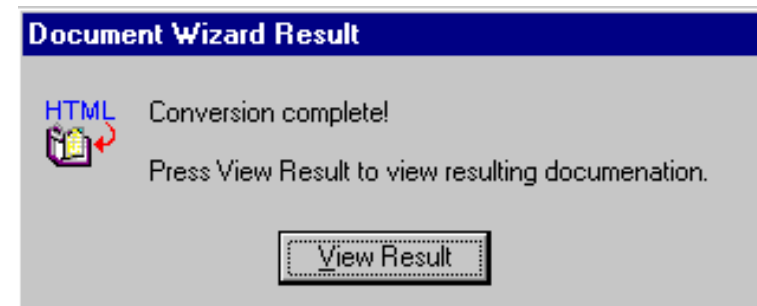
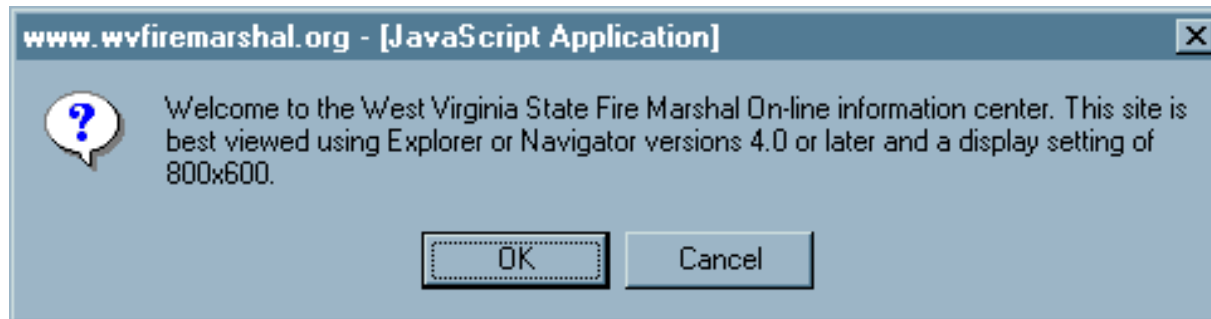
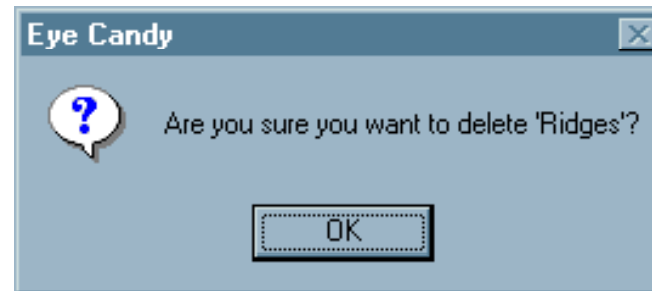
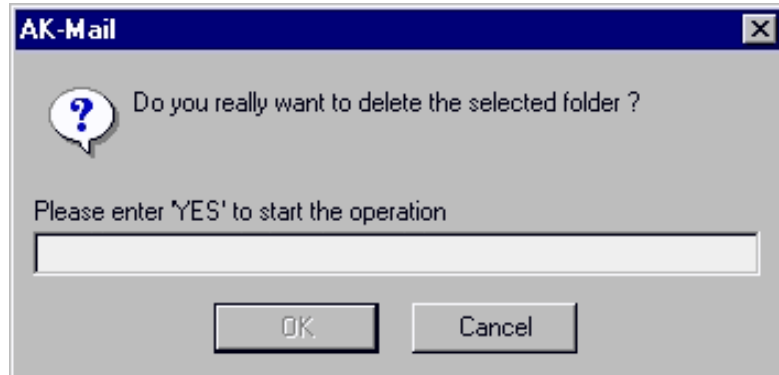
Bad error messages



Bad error messages



Bad error messages



UI Hall of Shame finalists

Lets learn from some more bad examples 😊

Interface Hall of Shame

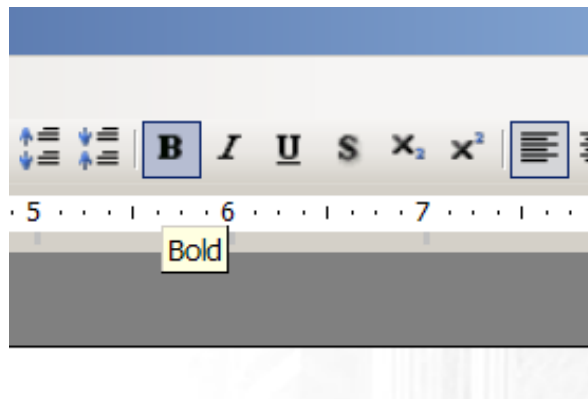
<http://homepage.mac.com/bradster/iarchitect/shame.htm>

Web pages that suck

<http://www.webpagesthatsuck.com/>

Back to good UI design ...

- **visibility**: Ability for user to find controls that are meant to be interacted with.
 - Where are they?
 - What is their state? ("Is this setting on or off?")
- **feedback**: Response from the control to the user before, during, or after an interaction.



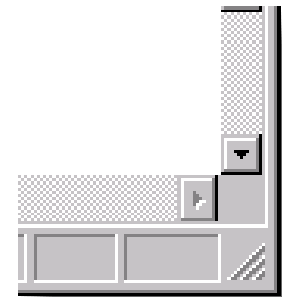
Affordances in UI design

affordance: A physical property of an object that indicates or influences how it is to be used

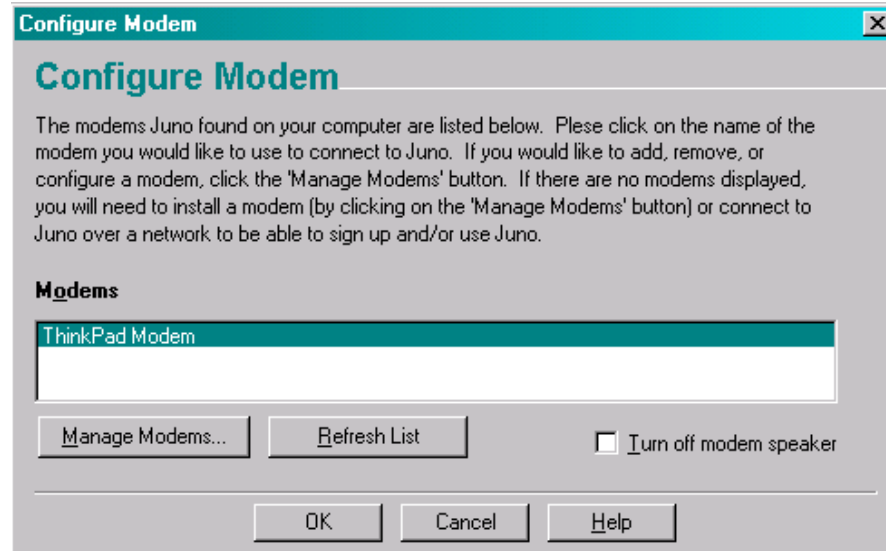
- 3D buttons stand out and are more likely to be clicked



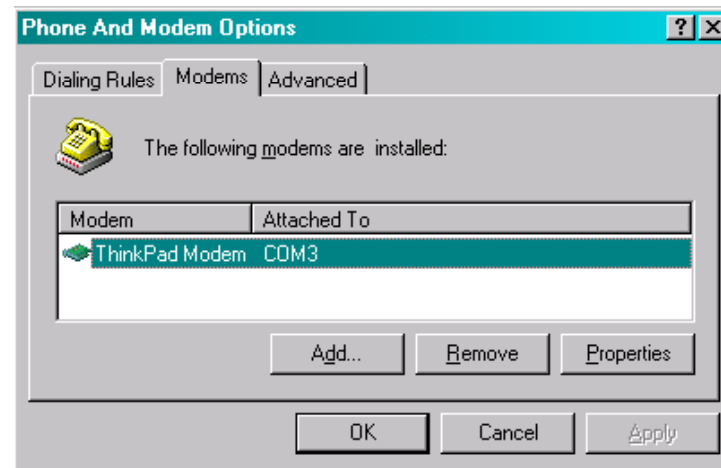
- Thick corner bars encourage resizing



Users don't read



- VS.



Common web usability problems

<http://www.useit.com/jakob/webusability/>

<http://www.useit.com/alertbox/9605.html>

Layout

- Clutter
- Bad assumptions about user's screen resolution
- Requires horizontal scrolling
- Poorly chosen colors
- Frames
- Splash screens
- Poor / missing navigation controls (Back, Forward, Home)
- Text is not scannable (can't be read quickly)
- Doesn't follow standard design conventions

More web usability problems

- Content

- Most important content isn't on the first page / screenful
- Nondescript headings
- Contains ads (or things that appear to be ads)
- Important site content is contained in PDF documents
- Isn't designed to be easily indexed by a search engine (HTML title, meta tags, page text, link text, etc.)

- Links

- Links that don't say where they go
- Badly chosen link text (such as "Click here for more info")
- Links that forcibly open a new browser window
- Links opened by complex Javascript needlessly
- Visited links don't appear in a different color

More web usability problems

- Features
 - Poorly performing site search
 - Having a web search feature (why??)
 - Not having a site map or other means to navigate the site
 - Relying on non-standard plugins or browser versions (e.g. Overly reliant on Flash, Java applets, etc.)
- Accessibility
 - Text forced too small for elderly / visually impaired users
 - Lack of ALT text and non-image data for visually impaired users
 - Tiny links (hard to click for motor-impaired users)

Suggestions for good web design

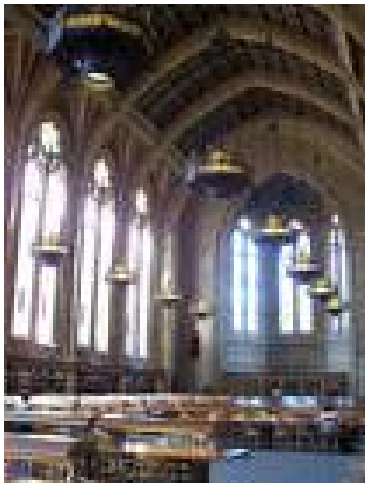
- o Place your name and logo on every page and make the logo a link to the home page
- o Provide search if the site has more than 100 pages.
- o Write straightforward and simple headlines and page titles that clearly explain what the page is about
- o Structure the page to facilitate scanning and help users ignore large chunks of the page in a single glance
- o Instead of cramming everything about a product or topic into a single, infinite page, use hypertext to structure the content space into a starting page that provides an overview and several secondary pages that each focus on a specific topic.
- o Use link titles to provide users with a preview of where each link will take them, before they have clicked on it.

Suggestions for web design

- Use relevance-enhanced image reduction when preparing small photos and images: instead of simply resizing the original image to a tiny and unreadable thumbnail, zoom in on the most relevant detail and use a combination of cropping and resizing.
- Ensure that all important pages are accessible for users with disabilities, especially blind users.
- Do the same as everybody else: if most big websites do something in a certain way, then follow along since users will expect things to work the same on your site.
- Test your design with real users as a reality check. People do things in odd and unexpected ways, so even the most carefully planned project will learn from usability testing.

UI exercise (from Sp07 final)

Draw a UI for a library search that has the following features:



- ability to enter a search string as an author, title, subject
- ability to search magazines and/or books
- ability to display multiple results, and to order them by either availability or earliest date of publication (but not both)

You should use the most appropriate UI component (button, pulldown, checkbox, scrollbar, etc) for each feature