

CHAPTER 8:

Fluid Navigation

*Designing the User Interface:
Strategies for Effective Human-Computer Interaction*

Sixth Edition

Ben Shneiderman, Catherine Plaisant,
Maxine S. Cohen, Steven M. Jacobs, and Niklas Elmqvist

*in collaboration with
Nicholas Diakopoulos*

Addison Wesley
is an imprint of



© 2017 Pearson Education, Inc., Hoboken, NJ. All rights reserved.

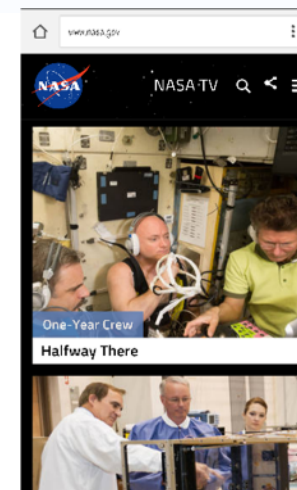
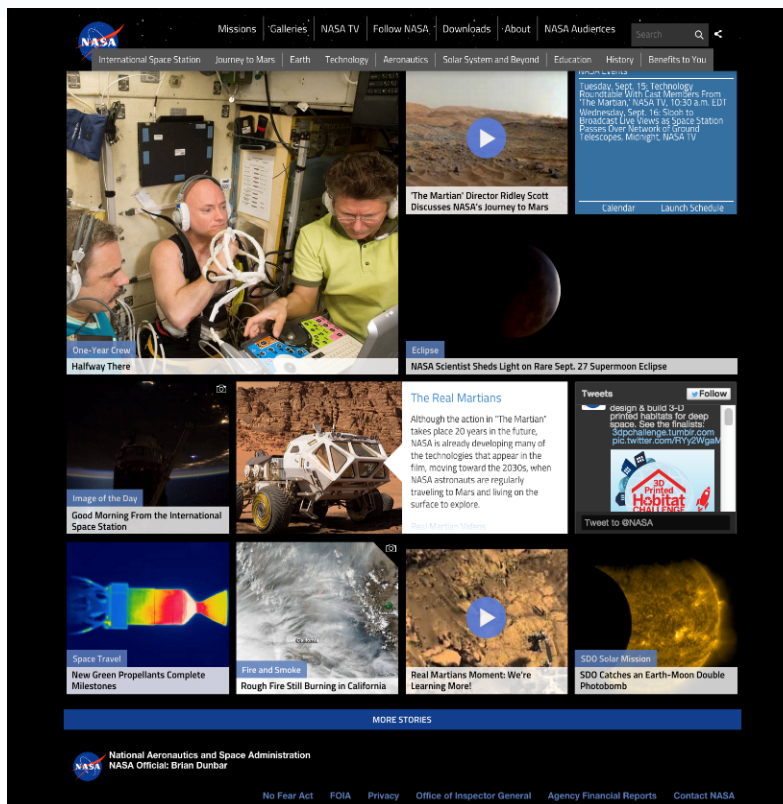
Navigation By Selection (continued)

Examples of common gestures and their effect:

- Tap: select
- Long press: varied, from magnified cursor (iOS) to showing a tooltip (Windows 8)
- Double tap: varied, e.g. zoom (iOS)
- Small swipe: varied, e.g. move location or order of objects, reveal a delete button
- Large swipe: usually scroll
- Rapid swipe or fling: fast scroll with inertia
- Pinch and spread: zoom in and out
- Variation with two or more fingers: varied effects

Navigation By Selection (continued)

- Menu bars, pop-up menus, toolbars, palettes, and ribbons



- The NASA website on the left consists of a large scrollable two-dimensional menu
 - Below the main menu each square or rectangle is a large button
 - Scrolling gives access to dozens of items easily updated and rearranged
 - This adaptive grid design scales down nicely to the small displays
- Above is the same webpage displayed on an Android phone
 - The grid now appears as a single column of items

<https://www.nasa.gov/>

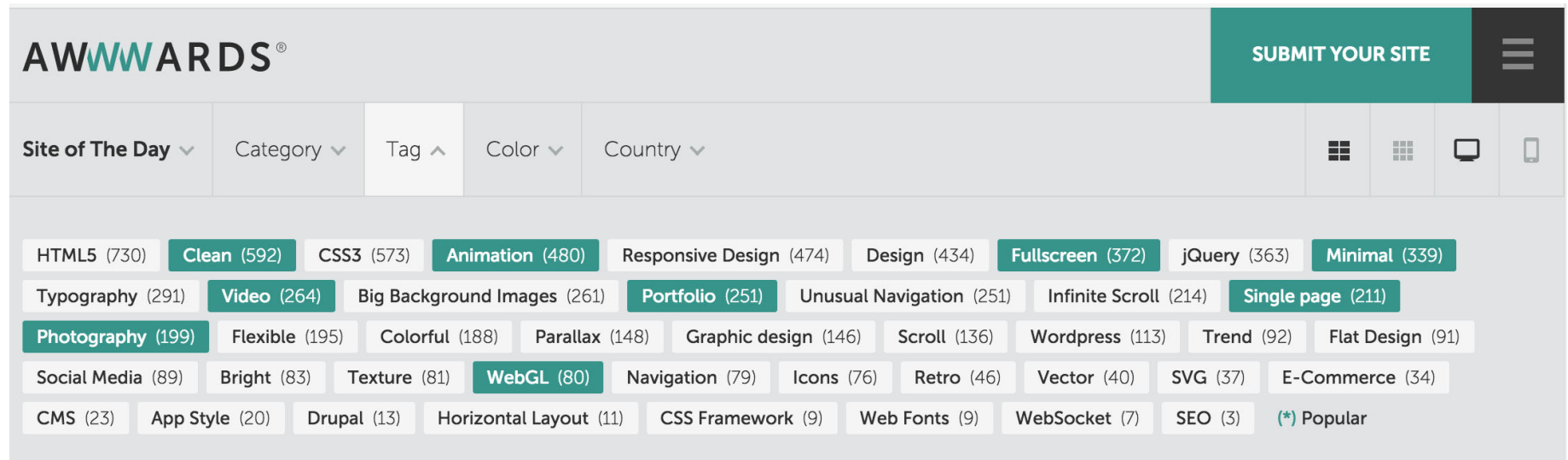
Navigation By Selection (continued)

- **Menus for long lists**
 - Sliders and alpha-sliders
 - When items consist of ranges or numerical values, a slider is a natural choice to allow the selection of a value
 - The alpha-slider uses multiple levels of granularity in moving the slider thumb and therefore can support tens or hundreds of thousand of items



Navigation By Selection (concluded)

- Menu bars, pop-up menus, toolbars, palettes and ribbons



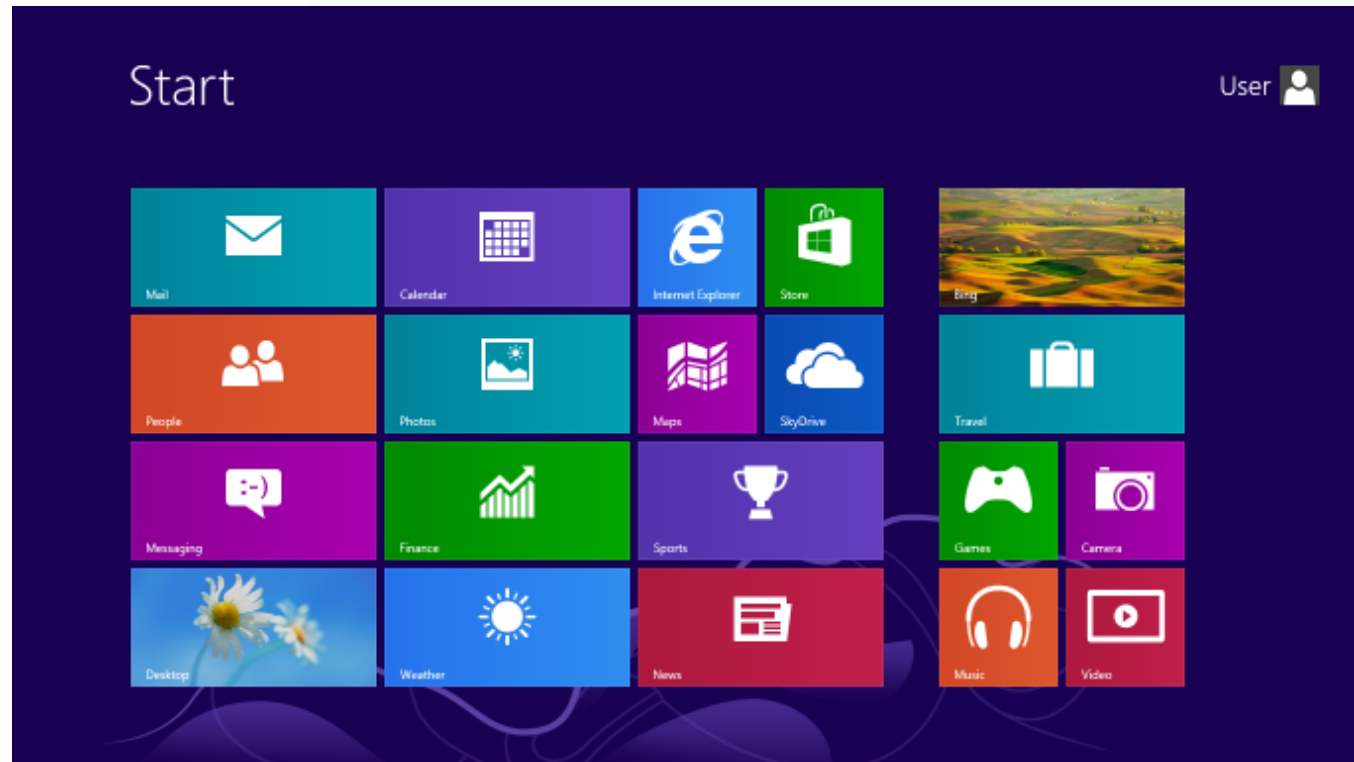
- <http://www.awwwards.com> gives awards to a large number of websites, which are tagged
 - A tag index at the top of the page displays all the tags, sorted by total count
 - The counts are indicated in parenthesis
 - The green colored tags are the popular tags that have been selected more often (which most likely will lead to even more selection)

Small Displays



- Small devices have very focused functionalities and few selectable areas.
- Discoverability is often an issue

Microsoft Interfaces



MS Windows 8 Problems

- Because it solved a problem that did not exist. Literally no one wanted to make the Start menu full screen and make the desktop experience an app. There was nothing wrong with Windows 7 at the time, and Windows 8 offered nothing new worth using at the time.
- Windows 8 was a complete ui overhaul, optimizing for touch interface. It worked pretty well on a tablet or such, but it was quite clunky to use with a mouse and keyboard, which was 99% of the use. In terms of performance it was pretty close or better to Windows 7, but it feels slower for the clunkiness.
- I'm a developer who's worked on many redesigns of apps and from experience, people just hate change in general. Even if the change looks, feels, and works better than the original, many will find a way to hate it. People get accustomed to using software a certain way. The ones who don't like it, would have switched to a different platform early on, leaving only those who like it or are willing to deal with it.

Comments from Reddit

Microsoft Interfaces

- It failed bc the ui was shit. As a sys admin i would have had to teach people who've sat at a pc for 20 years how to use the damn pc. MS also pushed a touch interface onto PCs and laptops for no discernible reason. I spent one hour with it, and made the call to stick w 7. There was simply zero gains in moving to it and increased productivity by not.
- Because it tried to cram a mobile operating system onto a desktop PC without modifying itself to be more like a desktop OS. The giant start menu was annoying to use if you didn't have a touch screen. Everything else about it was fine.
- Honestly? Because the touchscreen/tablet experience doesn't translate well to traditional computing. The vast majority of computer operation on desktops and laptops still happens via keyboard and mouse/trackpad. It's super awkward using a touch screen laptop or desktop for any extended period of time.

Comments from Reddit

Small Displays (concluded)

Design considerations for small displays:

- Simplify: “less is more”
- Strive to reduce or eliminate data entry
- Learnability is key
- Consider use frequency and importance
- Plan for interruptions
- Use of contextual information
- Make clear what is selectable and what is not
- Leave room for scroll and swipe gestures to avoid inadvertent actions
- Consider relegating less important functions to other platforms



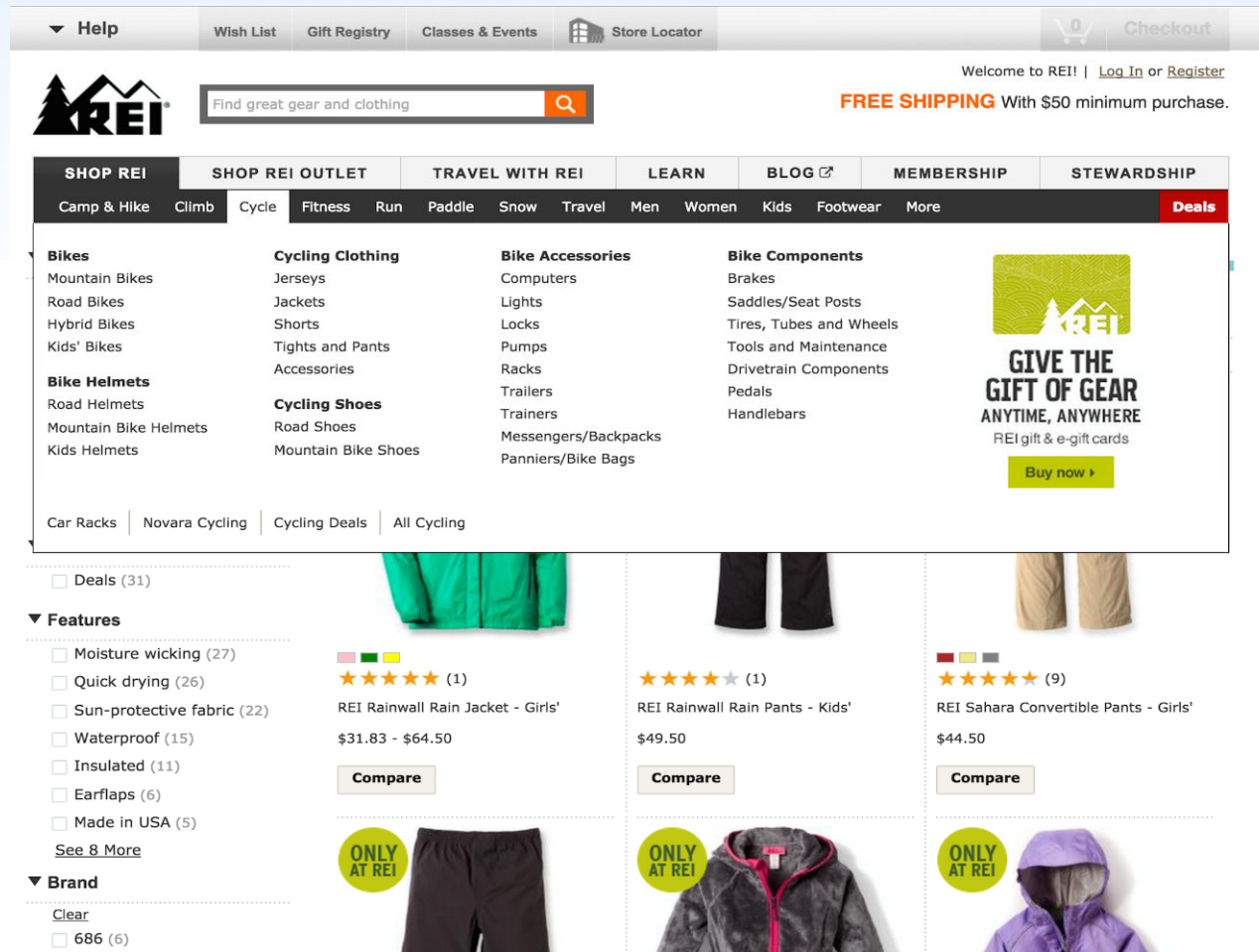
Content Organization

- Organizing menus in a meaningful structure results in faster selection time and higher user satisfaction
- Approaches:
 - Linear sequence (e.g. in a wizard or survey)
 - Hierarchical structure that is natural and comprehensible (e.g. a store split into departments)
 - Network structure when choices may be reachable by more than one path (e.g. websites)

Content Organization (continued)

- Content organization design:
 - **Tree-structure:** designers can form categories of similar items, e.g. online grocery markets divided into produce, meat, dairy, etc. further divided into vegetables, fruit, etc. for produce, and milk, cheese, etc. for dairy
 - **Breadth versus depth:** the depth (number of levels) of a menu tree depends in part on the breadth (number of items per level)
 - **Networks:** choices may be reachable by more than one path, e.g. websites for online shopping that provide access to banking information from both the personal profile and the checkout section of a link structure

Content Organization (continued)



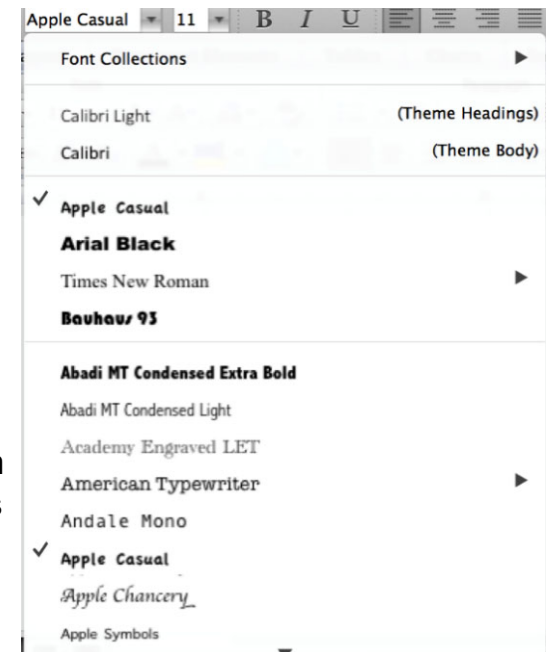
- In the REI website, the categories for “Cycle” are expanded all at once below the top menu, showing 34 items organized in a meaningful hierarchy as a large menu

Content Organization (continued)

- **Rules for forming menu trees:**
 - Use task semantics to organize menus
 - Limit the number of levels (i.e. prefer broad–shallow to narrow–deep)
 - Create groups of logically similar items: e.g. Level 1: countries, Level 2: states, Level 3: cities
 - Form groups that cover all possibilities: e.g. Age ranges: [0–9] [10–19] [20–29] and [\geq 30]
 - Make sure that items are non-overlapping: e.g. use “Concerts” and “Sports.” over “Entertainment” and “Events”
 - Arrange items in each branch by natural sequence (not alphabetically) or group related items
 - Keep ordering of items fixed (or possibly duplicate frequent items in dedicated section of the menu)

Content Organization (continued)

- Additional considerations for content organization design include:
 - sequence, phrasing and layout
- Typical lists are alphabetically ordered, but categorical lists may be useful
 - Principles of menu-list sequencing apply, e.g. sequencing menu items by frequency of use can be more useful than sequencing by category or alphabetical order
 - Example of adaptive split menus in Microsoft Office
 - A font-selection menu lists the theme fonts and then the recently used fonts near the top of the menu (as well as in the full list), making it easier to quickly select the popular fonts
 - A thin line separates the sections



Content Organization (continued)

- **Phrasing:**

- Use familiar and consistent terminology.
 - Carefully select terminology that is familiar to the designated user community and keep a list of these terms to facilitate consistent use
- Ensure that items are distinct from one another
 - Each item should be distinguished clearly from other items. For example, “Slow tours of the countryside,” “Journeys with visits to parks,” and “Leisurely voyages” are less distinctive than are “Bike tours,” “Train tours to national parks,” and “Cruise-ship tours”
- Use consistent and concise phrasing
 - Review the collection of items to ensure consistency and conciseness. Users are likely to feel more comfortable and to be more successful with “Animal,” “Vegetable,” and “Mineral” than with “Information about animals,” “Vegetable choices you can make,” and “Viewing mineral categories”
- Bring the keyword to the fore
 - Try to write menu items such that the first word aids the user in recognizing and discriminating between items — use “Size of type” instead of “Set the type size.” Then, if the first word indicates that this item is not relevant, users can begin scanning the next item

Content Organization (concluded)

- **Layout**

- Techniques to indicate position in the menu structure can be useful
- The set of headers below from the Library of Congress collections webpages gives a clear indication of progress down the tree
 - When users want to do a traversal back up the tree or to an adjoining menu at the same level, they will feel confident about what action to take

BROWSE BY TOPIC

Sports, Recreation & Leisure

Baseball

Baseball Cards 1887-1914

Audio Menus

- For Interactive Voice Response (IVR) systems, instruction prompts and lists of options are spoken to users, who respond by using the keys of a keyboard, phone, or by speaking
- Complex and deep menu structures should be avoided
 - ‘Listen carefully, as our menu options have recently changed’ ☹️
 - More in Chapter 9

Form Fill-in

Create an IEEE Account ?

*** Required field**

Provide your personal information

*** Given/First name:**

Middle name:

*** Last/Family/Surname:**

Enter e-mail address & password
The e-mail provided here will be the username of your account.

*** E-mail address:**

*** Re-enter e-mail address:**

*** Password:**

*** Confirm password:**

Validation Messages:

- Warning:** The e-mail address provided is not in a valid e-mail format (for example: j.doe@nomail.com). Please try again.
- Success:** Your password is good. Passwords must be between 8 and 64 characters, and include at least one number. [More...](#)

Set security questions
For your security, IEEE Accounts are required to have two security questions and answers.

*** Security question 1:**

*** Type your answer:**

*** Security question 2:**

*** Type your answer:**

[> Privacy & Opting Out of Cookies](#)

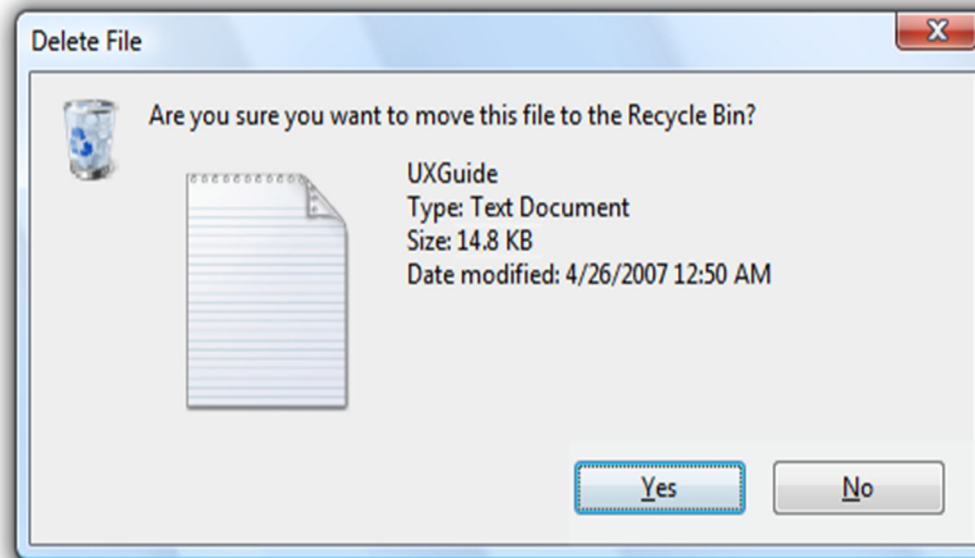
[Create Account and Continue Joining](#) [> Cancel](#)

- This form fill-in allows users to enter information when joining the IEEE Society
 - Fields are grouped meaningfully, and field-specific rules such as password requirements are provided next to the fields
 - The data is validated as soon as it is being provided (opposed to being validated when the form is submitted) and error messages explain how to correct the problem (<http://www.ieee.org>)

Data Entry with Form Fill-in

- **Form Fill-in**
 - Appropriate when many fields of data must be entered:
 - Full complement of information is visible to user
 - Display resembles familiar paper forms
 - Few instructions are required for many types of entries
 - Users must be familiar with:
 - Keyboards
 - Use of TAB key or mouse to move the cursor
 - Error correction methods
 - Field-label meanings
 - Permissible field contents
 - Use of the ENTER and/or RETURN key

Dialog Boxes



- This dialog box includes a binary menu with two choices (Yes or No)
 - The blue highlighting on Yes indicates that this selection is the default and that pressing Return will select it
 - Specific keyboard shortcuts can be made available
 - Escape closes the dialog box
 - Typing the letter 'N' will select 'No' as indicated by the underlined letter 'N'


Dialog Boxes (continued)

Signal Word
Provide clear visual cues and type of alerts

Nature of hazard
Provide succinct reason for the alert

Actions
Provide a list of actions to respond to the alert

User Feedback
Provide ability to capture user feedback

 **WARNING!** Drug - Drug Interaction
Warfarin - Aspirin
Increased risk of bleeding [i guidelines](#)
Management

Aspirin

Keep **Aspirin**, do not order Warfarin

Warfarin

Keep **Warfarin**, cancel Aspirin

Override

Order both **Warfarin and Aspirin** ☐ Confirm override
Check INR frequently and advise patient for warning signs of bleeding

[Provide feedback on this alert](#)

Cancel

- This dialog box is used to alert clinicians who try to prescribe the drug Warfarin, because it increases the risk of bleeding of patients already on Aspirin
 - Several possible actions are proposed
 - Overriding the alert is possible but requires confirmation by clicking a check box
 - Because of the severity of the alert, this is a modal dialog box and it requires immediate action

Data Entry with Dialog Boxes

- **Dialog Boxes**
 - Combination of menu and form fill-in techniques
 - Internal layout guidelines:
 - Meaningful title, consistent style
 - Top-left to bottom-right sequencing
 - Clustering and emphasis
 - Consistent layouts (margins, grid, white space, lines, boxes)
 - Consistent terminology, fonts, capitalization, justification
 - Standard buttons (OK, Cancel)
 - Error prevention by direct manipulation

Data Entry with Dialog Boxes (concluded)

- **Dialog Boxes**
 - External Relationship
 - Smooth appearance and disappearance
 - Distinguishable but small boundary
 - Size small enough to reduce overlap problems
 - Display close to appropriate items
 - No overlap of required items
 - Easy to make disappear
 - Clear how to complete/cancel