

Lecture 10 Interaction Styles

10 Different Interaction Styles

Heim, Chapter 2.3



Copyright © 2008 Pearson Education, Inc. Publishing as Pearson Addison-Wesley

IEEE Spectrum 03/2011



1-2

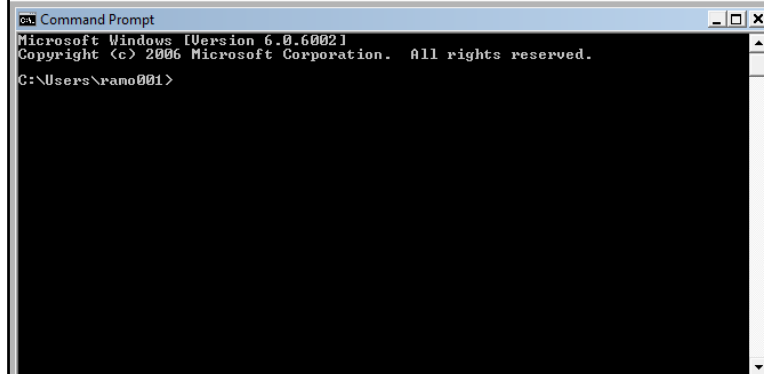
Interaction Styles

- Command Line
- Menu-Based Interface
- Form Fill-In
- Question and Answer
- Direct Manipulation
- Metaphors
- Web Navigation
- Three-Dimensional Environments
- Zoomable Interface
- Natural Language

Copyright © 2008 Pearson Education, Inc. Publishing as Pearson Addison-Wesley

1-3

Interaction Styles - *Command Line*



1-4

Interaction Styles - *Command Line*

- Command-line interfaces are fast and powerful.
 - Many commands are abbreviated
 - quick and efficient
 - Commands can be applied to many objects simultaneously
 - fast input
 - Some commands have multiple parameters that can be set and altered
 - precise and flexible

Interaction Styles - *Command Line*

- Command Line and the EEAC
 - Intention formation, specification of the action, and the execution stages are complex
 - Requires a rather accurate mental model of the computer's internal processing
- Command Line and the Interaction Framework
 - Translating the user's task language into the input language requires knowledge of the core language
 - The output language can be confusing for inexperienced users - there is very little feedback

Interaction Styles - *Command Line*

- Command Line and Articulatory Distance
 - Articulatory distance is large because we are presented with only the command prompt - no indication of functionality

Interaction Styles - *Command Line*

- Advantages of command-line interfaces:
 - Suitable for repetitive tasks
 - Advantageous for expert users
 - Offer direct access to system functionality
 - Efficient and powerful
 - Not encumbered with graphic controls
 - Low visual load
 - Not taxing on system resources
 - Scriptable

Interaction Styles - *Command Line*

- Disadvantages of command-line interfaces:
 - Low command retention
 - Steep learning curve
 - High error rates
 - Heavy reliance on memory
 - Frustrating for novice users

Interaction Styles - *Menu-Based Interface*



Interaction Styles - *Menu-Based Interface*

- Menu-driven interfaces present users with sequential hierarchal menus that offer lists of functions.
 - Textual: key-in number of option
 - Graphical: use arrow keys or pointing device

Interaction Styles - *Menu-Based Interface*

MAXIM

Menus are based on recognition as opposed to recall

- No need to remember commands
- Users search from a list of possible choices
- List provides constraints
- Appropriate for small screens (iPod)



Interaction Styles - Menu-Based Interface

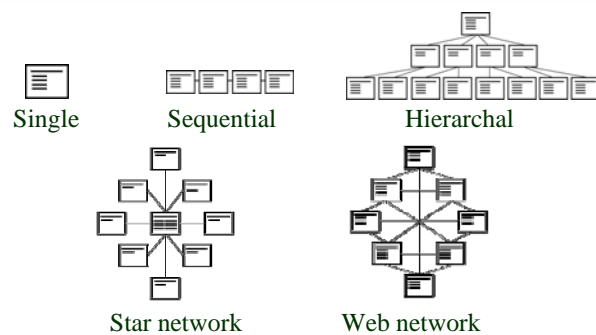
- Menu-based interfaces and the EEAC
 - Menu constraints can help the user to form the proper intentions and specify the proper action sequence
 - Provide a context to evaluate the output language

Interaction Styles - Menu-Based Interface

- Menu-based interfaces and :
 - **Articulatory Distance**
 - Menu options create small articulatory distance
 - **Mental Models**
 - Menu construction has a direct impact on user's mental model
 - **Affordances**
 - Menu elements present affordances

Interaction Styles - Menu-Based Interface

- Most menus are a variation on a few basic categories:



Interaction Styles - Menu-Based Interface

- Advantages of menu-based interfaces:
 - Low memory requirements
 - Self-explanatory
 - Easy to undo errors
 - Appropriate for beginners
- Disadvantages of menu-based interfaces:
 - Rigid and inflexible navigation
 - Inefficient for large menu navigation
 - Inefficient use of screen real estate
 - Slow for expert users

Interaction Styles - Form Fill-In

A screenshot of a web browser displaying the Air New Zealand booking website. The page is titled "PASSENGER 1 - ADULT" and contains a form for entering passenger details. The form includes fields for name (Title, First Name, Middle Name, Last Name), phone number, date of birth, gender, nationality (New Zealand), passport number, frequent flyer program (none), meal request (Standard Meal), and travel insurance (3 days cover - NZD \$60.00). There are "Start Over" and "Continue" buttons at the bottom of the form. The browser's address bar shows the URL "https://flightbookings.airnewzealand.co.nz/book_en_NZ".

1-17

Interaction Styles - Form Fill-In

- Similar to menu interfaces – present screens of information
- Different than menu interfaces - used to capture information and proceed linearly not to navigate a hierarchical structure

Copyright © 2008 Pearson Education, Inc. Publishing as Pearson Addison-Wesley

1-18

Interaction Styles - Form Fill-In

MAXIM

Always inform the user about the length of paged forms and where they are within the structure

- Forms can be presented using
 - Single scrolling screens
 - Multiple linked pages
- Form elements must be grouped logically
- Include “You Are Here” indications

Copyright © 2008 Pearson Education, Inc. Publishing as Pearson Addison-Wesley

1-19

Interaction Styles - Form Fill-In

MAXIM

Form elements must be unambiguously labeled to increase data integrity

- Users must understand what data is required and what format should be used

– Date information formats

1/29/2005, 29/1/2005, or January 29, 2005?

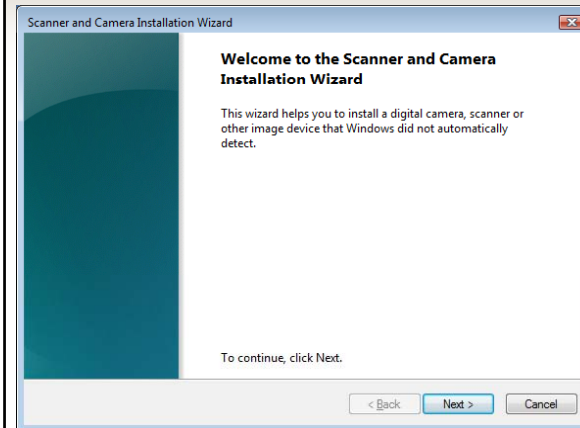
Copyright © 2008 Pearson Education, Inc. Publishing as Pearson Addison-Wesley

1-20

Interaction Styles - Form Fill-In

- Advantages of form fill-in interfaces:
 - Low memory requirements
 - Self-explanatory
 - Can gather a great deal of information in little space
 - Present a context for input information
- Disadvantages of form fill-in interfaces:
 - Require valid input in valid format
 - Require familiarity with interface controls
 - Can be tedious to correct mistakes

Interaction Styles - Question and Answer



Interaction Styles - Question and Answer

- Question and answer interfaces are also called wizards.
- They are restricting for expert users
- They are easy for novice users
 - However, they may not know the required information

MAXIM

Users must be able to cancel a menu without affecting the state of the computer

Interaction Styles - Question and Answer

- Microsoft Add Network Place Wizard

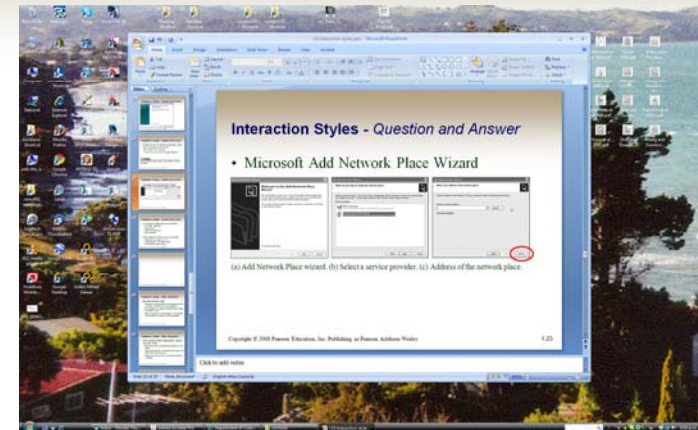


(a) Add Network Place wizard. (b) Select a service provider. (c) Address of the network place.

Interaction Styles - *Question and Answer*

- Advantages of question and answer interfaces:
 - Low memory requirements
 - Self-explanatory
 - Simple linear presentation
 - Easy for beginners
- Disadvantages of question and answer interfaces:
 - Require valid input supplied by user
 - Require familiarity with interface controls
 - Can be tedious to correct mistakes

Interaction Styles - *Direct Manipulation*



Interaction Styles - *Direct Manipulation*

- Ben Shneiderman (1982)
 - Continuous representations of the objects and actions of interest with meaningful visual metaphors.
 - Physical actions or presses of labeled buttons instead of complex syntax.
 - Rapid, incremental, reversible actions whose effects on the objects of interest are visible immediately.

Interaction Styles - *Direct Manipulation*

- Three phases in Direct Manipulation - Cooper, Reimann (2003)
 - **Free Phase**—How the screen looks before any user actions
 - **Captive Phase**—How the screen looks during a user action (click, click-drag, etc.)
 - **Termination Phase**—How the screen looks after a user action

Interaction Styles - *Direct Manipulation*

- Direct Manipulation and the EEAC
 - The range of possible intentions is consistently wide
 - Users usually have multiple options for specifying action sequences
 - Can be overwhelming of novice users
 - Provide multiple ways of executing action sequences

Interaction Styles - *Direct Manipulation*

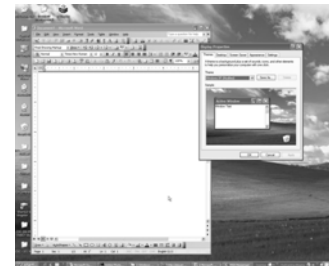
- Advantages of direct manipulation interfaces:
 - Easy to learn
 - Low memory requirements
 - Easy to undo
 - Immediate feedback to user actions
 - Enables user to use spatial cues
 - Easy for beginners
- Disadvantages of direct manipulation interfaces:
 - Not self-explanatory
 - Inefficient use of screen real estate
 - High graphical system requirements

Imagine that you want to copy all images from every directory down a folder hierarchy into a single folder. Discuss the advantages of a Direct Manipulation interface versus a Command Line interface for this task.

Interaction Styles - *Metaphors*

Microsoft Windows XP

Apple OS X



Interaction Styles - *Metaphors*

- GUIs use visual relationships to real-world objects (metaphors)
- Metaphors can help people relate to complex concepts and procedures by drawing on real-world knowledge
- Real-world affordances can be reflected
- What metaphors are used by contemporary GUIs?

Interaction Styles - *Metaphors*

MAXIM

A metaphor's function must be consistent with real-world expectations

- Metaphors that do not behave the way people expect will cause confusion and frustration
- Macintosh trashcan



Interaction Styles - *Metaphors*

MAXIM

Don't force a metaphor

- Potential problems with metaphors
 - Run out of metaphors
 - Some virtual processes and objects have no real-world counter parts
 - Mixed metaphors
 - Carry connotations and association