Chapter 2

Exploring the

Human-Computer

Interface

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Learning Objectives

- Give names to computing features that you know intuitively

- Explain placeholders and the placeholder technique

- Explain how "metaphor" is used in computing

- Describe the desktop metaphor, giving examples of appropriate icons

- Describe the touch metaphor, giving sample motions

- Explain how the desktop and touch metaphors differ

Feedback [1/2]

- Computer systems always give the user feedback about what is happening

    - We want our "assistant" to report on the progress of the task it is doing

    - We need to know that the task was done and when to give another one

- Feedback is an indication that either the computer is still working or it is done

- Feedback takes many forms:

    - The revision (new status) is visible

    - Areas on the screen become highlighted, shaded, gray, underlined, color change, or you might hear a click

Feedback [2/2]

- Most common form of feedback is that the computer is performing a time-consuming operation

    - Cursor is replaced by a different icon:

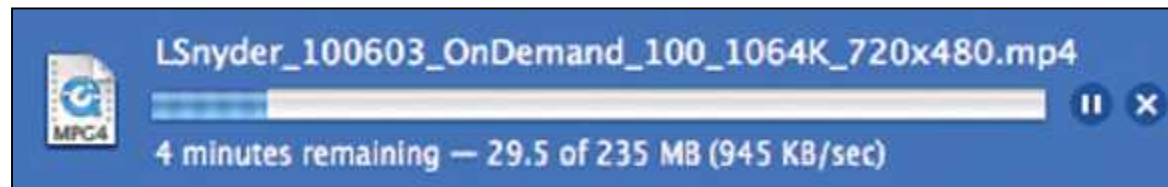   (hour glass),   (rainbow spinner),   (little dog running)

    -   Some apps give custom feedback: (busy spinner)

   - Use a progress bar to give an estimate on time remaining

    LSnyder_100603_OnDemand_100_1064K_720x480.mp4

    4 minutes remaining — 29.5 of 235 MB (945 KB/sec)

Consistent Interface

• Regardless of who makes the software, icons and menus tend to be similar

  • Especially so within a specific company (ex. Microsoft)

  • Look for similar menu names, like File and Edit

  • Look for similar functions within the menus, like Cut, Copy, Paste in the Edit menu

• Why?

  - Companies reuse the same code in each of their applications

  - Aids you in learning and using additional applications

  - Certain operations are so fundamental to processing that all apps just reuse those operations

New Instance

- Under "File", you usually find a command, "New"

    - New creates a "blank" instance of the kind of files the application creates

    - What is "blank information"?

        - An empty structure to hold (record) all of the properties of that file and store its content

        - Example: A new/empty address book entry is ready to hold names, images, and phone numbers about the new individual

- New Instance for the Address Book
- 새주소추가 in 서울대 email system
- 새편지쓰기 in 서울대 email system
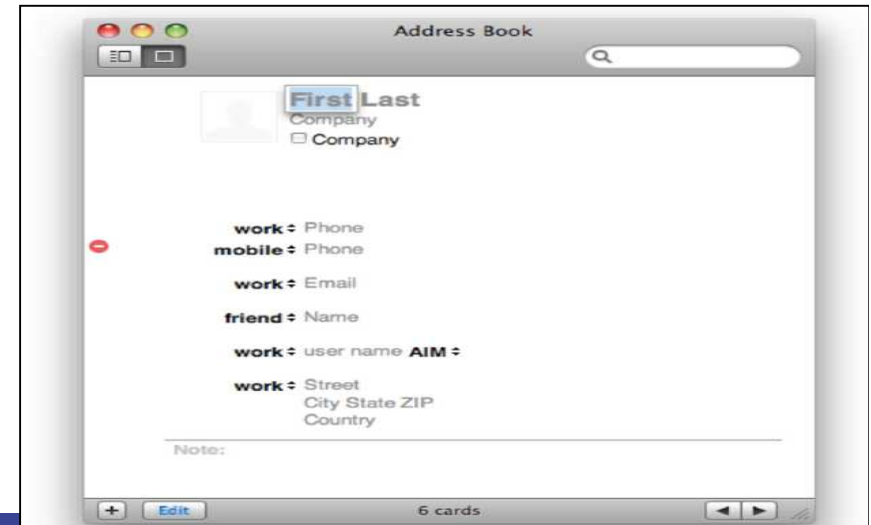
Figure 2.1 A visual form of a blank instance of contact information from an electronic address book; the instance has structure inside the computer with empty fields, as shown.

Clicking and Blazing

- Consistency provides a strong sense of familiarity with a new application

- With a new app, two important activities are immediately performed by a user:

    - "Clicking Around" to explore the application to see what features are available

        - Justified by the consistent interface

    - "Blazing Away" is trying the application in a way you haven't done so before

        - Justified because running SW cannot break the computer

Blaze: (1) 불길, 화염 (2) 개척하다

Perfect Reproduction of Digital Information

- Computers encode information as a sequence of binary digits, 0's and 1's

- Because of the use of two digits, we call it digital information

- Using only 0's and 1's means that digital information can be perfectly reproduced or replicated: | 10010111 10101100 11001010 |

- Analog information comes from or is stored on a continuously variable medium (newspaper, vinyl record, etc)

    - Ex: A copy of an analogue image could come out too dark or too light when compared to the original

Ways of Copying in Digital Worlds [1/3]

Copy/Paste/Edit is everyday work in digital world!

- Copy and Paste operations are available in many applications

- When editing a file, you can either create content from "scratch" or use Copy/Paste (C/P) to reproduce it from another location

- Copy/Paste is generally faster and less error prone

Ways of Copying in Digital Worlds [2/3]

- Find and ReplaceAll

    - Find/ReplaceAll (F/RA) is an all-at-once version of Copy/Paste

    - Use an abbreviation of a long name or title as a placeholder, then use

      Find/ReplaceAll to put in the correct name all at once!

        - Aung San Suu Kyi ➜ ASSK
        - "Because she was under house arrest, assk could not go to Oslo to accept the prize"

- Placeholder

    - 식안의 특정문자에 특정이름을 대입하는 방법
    - 낙하산으로 자리에 앉은 사람

Figure 2.2 Aung San Suu Kyi, winner of the 1991 Nobel Peace Prize "for her nonviolent struggle for democracy and human rights."

Ways of Copying in Digital Worlds [3/3]

Hide/Edit/Restore

Original	Correct text hidden	Correction made	Correct text restored
Et cetera is abbreviated etc. An alternative to using etc is to say "and so forth," "and others," etc. Remember that before etc an "and" is unnecessary.	Et cetera is abbreviated # An alternative to using etc is to say "and so forth," "and others," # Remember that before etc an "and" is unnecessary.	Et cetera is abbreviated # An alternative to using etc. is to say "and so forth," "and others," # Remember that before etc. an "and" is unnecessary.	Et cetera is abbreviated etc. An alternative to using etc. is to say "and so forth," "and others," etc. Remember that before etc. an "and" is unnecessary.

Figure 2.3 Illustration of the placeholder technique changing *etc* to *etc.* without inserting double periods.

- "etc."s are hidden by "#"
- the remaining "etc"s are replaced by "etc."
- the "#"s are restored by "etc."
- Then you are done!

Metaphors (방식, 스타일)

- In computing, a metaphor is an icon or image used as representative or symbolic of a computation

- When designers create a technology, they use metaphors to help users know how to operate their devices without reading a manual

- In the '70s, the first personal computer (the Alto) was developed

  - The first computer with a Graphic User Interface when the computer booted

- Since the computer was designed for business use, the metaphor that was used for the screen was desktop

 - Other business metaphors: files, folder, documents

The Desktop Metaphor [1/2]

Macintosh, 1984

Figure 2.4 The command line interface: The top line is a user request for a command list of the file transfer program; the response is the available commands. After that, the user asks for an explanation of "get" and gets a two-word answer. In the last line, the computer waits for the user to type the next command.
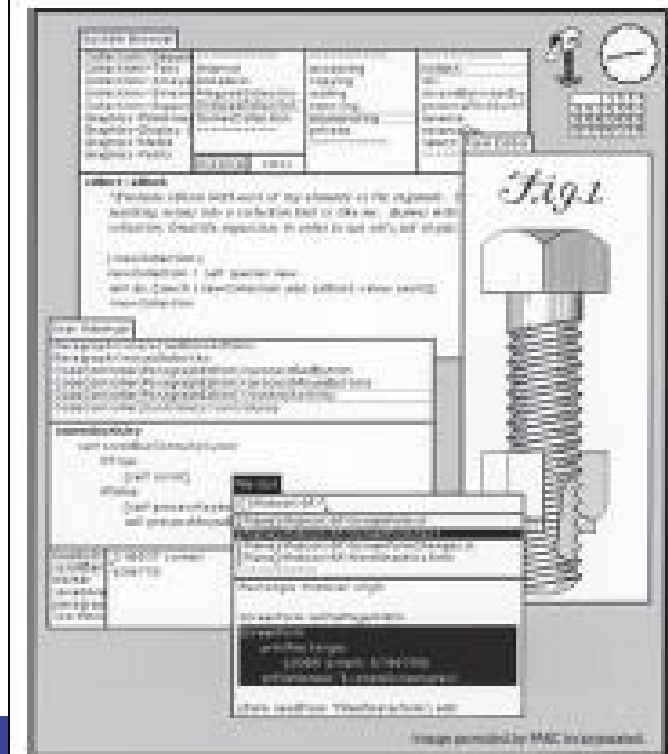
Alto GUI

The Desktop Metaphor [2/2]

- Steve Jobs and Steve Wozniak founded Apple and built computers without GUIs

- Jobs saw the Alto and liked the GUI concept

- Apple redesigned an unsuccessful personal machine (Lisa), then launched the Mac in 1984

- Soon after, Microsoft began developing Windows to replace its DOS system

Figure 2.5 Evolution of the mouse: (a) prototype of Engelbart's 1967 invention, (b) Alto's three-button mouse, and (c) original Macintosh one-button mouse.

A new idea, the touch metaphor

• Users touch the content, smart phones, tablets, and other mobile devices

• Example: the Cover Flow mechanism for scanning through a list, using a sweeping motion of the pointer

Figure 2.4 Cover Flow, part of the touch metaphor; the item in the center (face on) is selected.

Touch Metaphor Gestures

Table 2.1 Example gestures supporting the touch metaphor

Gesture	Description	Typical Use	Typical Result
Sweep or Swipe	Move finger across surface	Scan through a list	Items sweep by, with one selected
Tap	Light one-figure tap on surface	Select or choose	Item identified
Double Tap	Light two-figure tap on surface	Launch	Selected item starts
Drag	Move selected item by pulling	Move item	Item in new position
Pinch Fingers / Pull Fingers Apart	Contract / expand separation between fingers	Shrink / zoom	Image is resized
2-Finger Scroll	Move fingers across surface	Navigation	Move around a clipped image
Flick	Quick sweep, finger leaves surface	Express acceleration	Sustained sweep

(a)

(b)
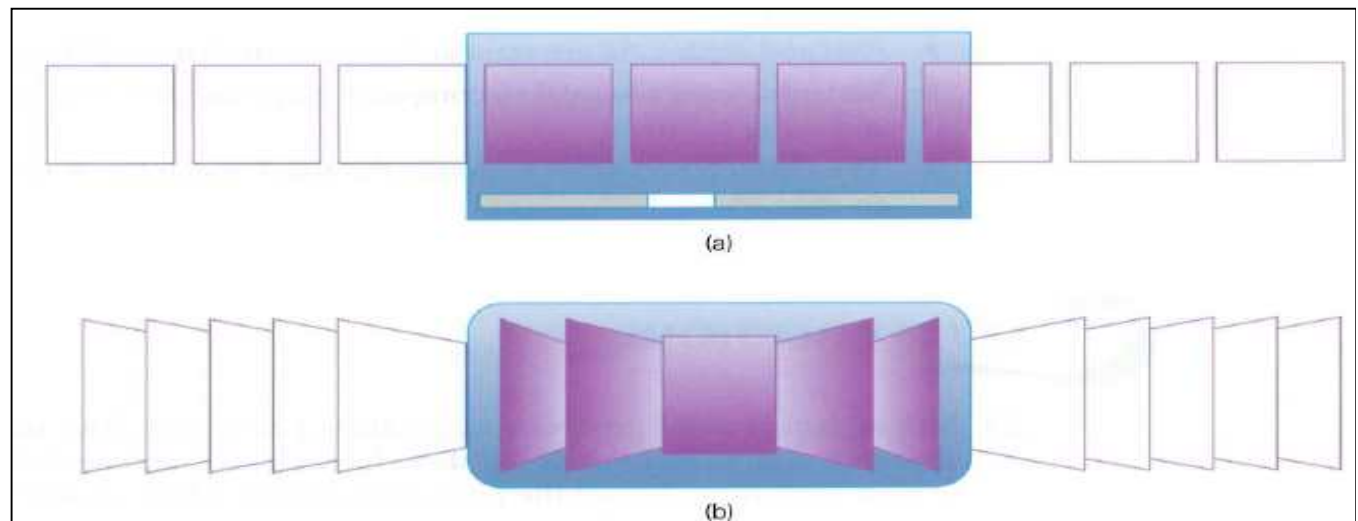
Figure 2.7 Schematic of two metaphors: (a) desktop metaphor window with scroll bar, and (b) touch metaphor with Cover Flow. To navigate to the last item on the right end, move the scroll bar *right*, or swipe the covers *left*.

Touch Metaphor vs Desktop Metaphor

• The touch metaphor is intended to simplify the use of smart phone and tablets

• This technology is not new (use of stylus and touch screen interaction at kiosks)

• It's possible to use the touch metaphor with a trackpad or mouse so it is not limited to mobile devices

• It's not only a way to eliminate the mouse, but also It changes how humans interact with the computer

  • Scrollbars using the desktop metaphor for moving through a display

  • Small screens in mobile gadgets don't have room for scrollbars

  • Direction of motion is opposite between touch and desktop metaphor

  • With the touch metaphor, your hands are "on" the content

  • You move the content to where you want it to be

  • With the desktop metaphor you "slide a window over the content"

Summary

- We can figure out software because designers use consistent interfaces, suggestive metaphors, and standard functionality

  - We should explore a new application by "clicking around" and "blazing away"

- Making exact copies is a fundamental property of digital information that we use daily

  - Find and ReplaceAll are standard operations that simplify our computer use

- Metaphors are essential to computer usage because the guide us in learning and using software

- We use technical metaphors daily

  - They are 100 percent synthetic, created by imagination of the developers

  - They are meant to simplify the use of the devices

- The touch metaphor will not replace the desktop metaphor, they will coexist