



Interfaces 1

8/30/18

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1. Command-based

Commands such as abbreviations (e.g. ls) typed in at the prompt to which the system responds (e.g. listing current files)

Some are hard wired at keyboard (delete), others can be assigned to keys

Efficient, precise, and fast

Large overhead to learning set of commands

```
D:\temp\Test>ogis2svg.exe seenganz seenganz.svg 0.1
ogis2svg.exe (version 0.5, 2005-09-13)
Usage: ogis2svg.exe --input yourinputShapeFile --output youroutput.svg --roundval 0.1 [--scale 25000] [--inputunits m] [--outputunits mm] [--referenceframe] [--ads]
      you have to specify an input file <shp>!

D:\temp\Test>ogis2svg.exe --input seenganz --output seenganz.svg --roundval 0.1
working on layer seenganz ...
converting shapefile to a temporary sqlfile ... done.
tablename: seenganz

The following attributes are available. Please select the attributes you want to
include in the SVG export:

Attribute=gid, Type=serial; Do you want to include it [y\!n]?_
```

2. WIMP and GUI

Xerox Star first WIMP -> rise to GUIs

Windows

- could be scrolled, stretched, overlapped, opened, closed, and moved around the screen using the mouse

Icons

- represented applications, objects, commands, and tools that were opened when clicked on

Menus

- offering lists of options that could be scrolled through and selected

Pointing device

- a mouse controlling the cursor as a point of entry to the windows, menus, and icons on the screen

GUIs

Same basic building blocks as WIMPs but more varied

- Color, 3D, sound, animation,
- Many types of menus, icons, windows

New graphical elements, e.g.

- toolbars, docks, rollovers

Challenge now is to design GUIs that are best suited for tablet, smartphone and smartwatch interfaces

Windows

Windows were invented to overcome physical constraints of a computer display

- enable more information to be viewed and tasks to be performed

Scroll bars within windows also enable more information to be viewed

Multiple windows can make it difficult to find desired one

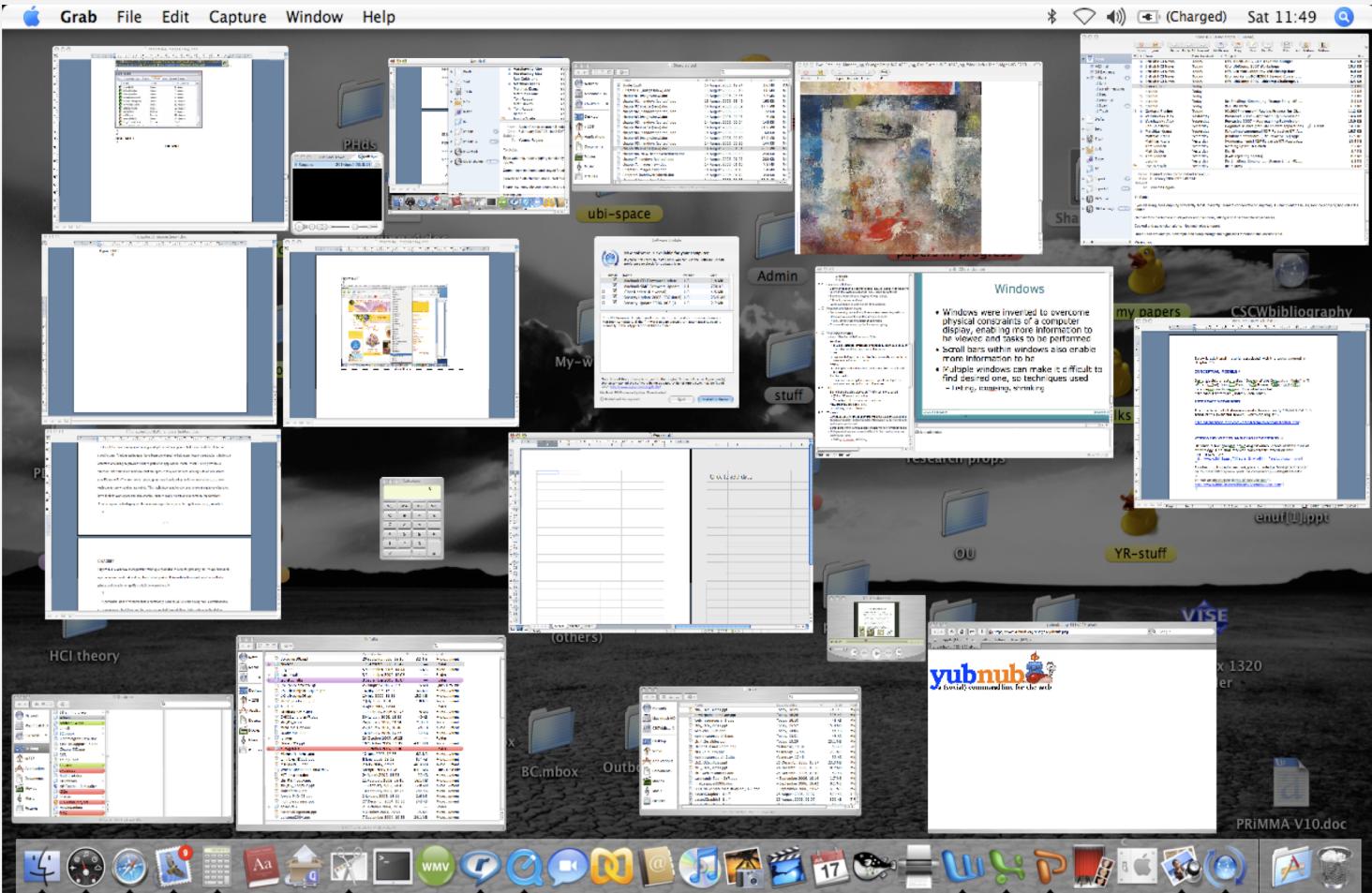
- listing, iconising, shrinking are techniques that help



Figure 6.2 The boxy look of the first generation of GUIs. The window presents several check boxes, notes boxes, and options as square buttons

Source: Mullet, Kevin; Sano, Darrell, *Designing Visual Interfaces: Communication Oriented Techniques*, 1st, © 1995. Reproduced by permission of Pearson Education, Inc., Upper Saddle River, New Jersey.

Apple's shrinking windows



Safari panorama window view

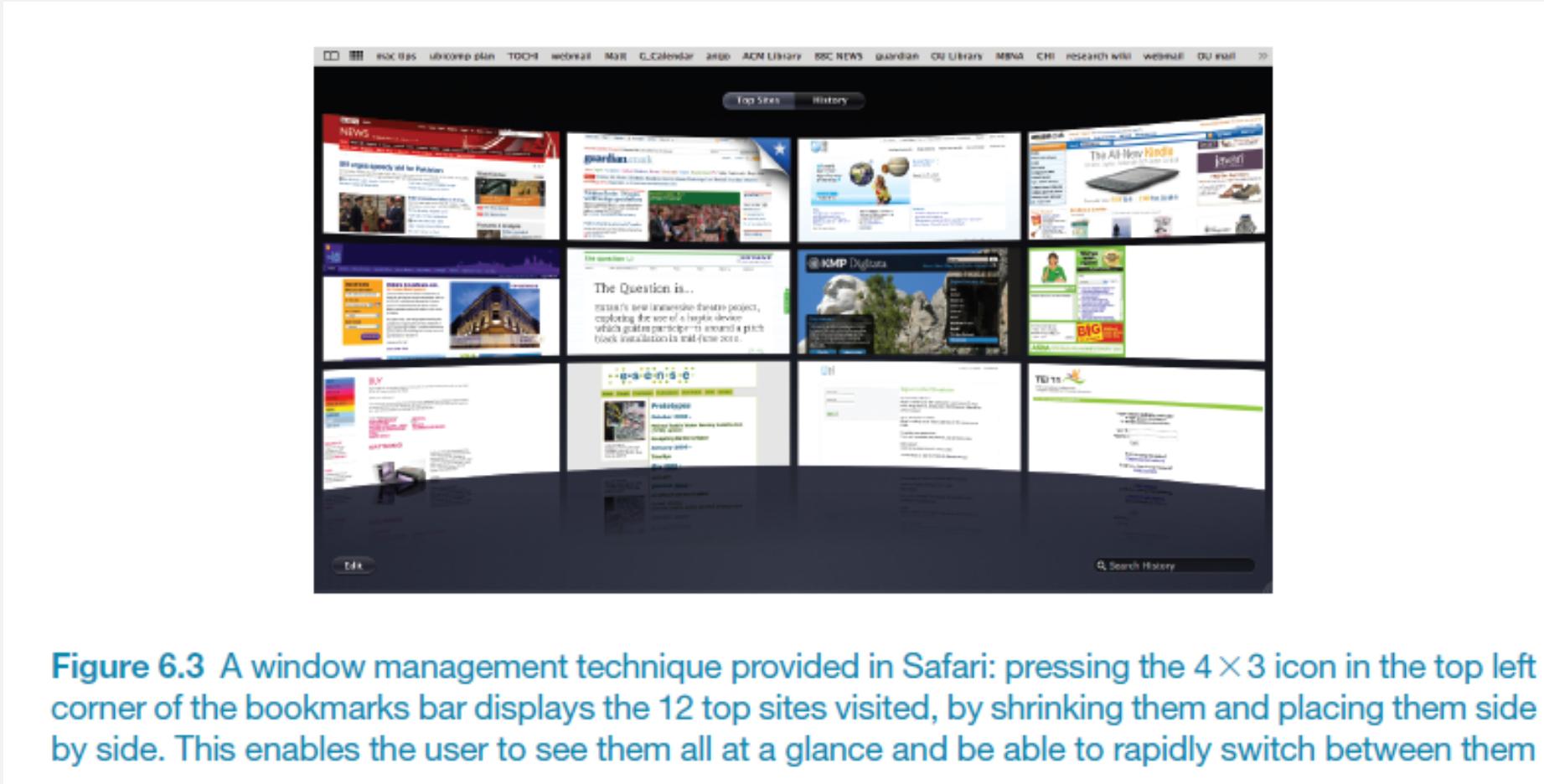


Figure 6.3 A window management technique provided in Safari: pressing the 4×3 icon in the top left corner of the bookmarks bar displays the 12 top sites visited, by shrinking them and placing them side by side. This enables the user to see them all at a glance and be able to rapidly switch between them

Research and design issues

Window management

- enables users to move fluidly between different windows (and monitors)

How to switch attention between windows without getting distracted

Design principles of spacing, grouping, and simplicity should be used

Menus

A number of menu interface styles

- flat lists, drop-down, pop-up, contextual, and expanding ones, e.g., scrolling and cascading

Flat menus

- good at displaying a small number of options at the same time and where the size of the display is small, e.g. iPods
- but have to nest the lists of options within each other, requiring several steps to get to the list with the desired option
- moving through previous screens can be tedious

<https://www.nngroup.com/articles/flat-vs-deep-hierarchy/>

Expanding menus

Enables more options to be shown on a single screen than is possible with a single flat menu

More flexible navigation, allowing for selection of options to be done in the same window

Most popular are cascading ones

- primary, secondary and even tertiary menus
- downside is that they require precise mouse control
- can result in overshooting or selecting wrong options

Cascading menu

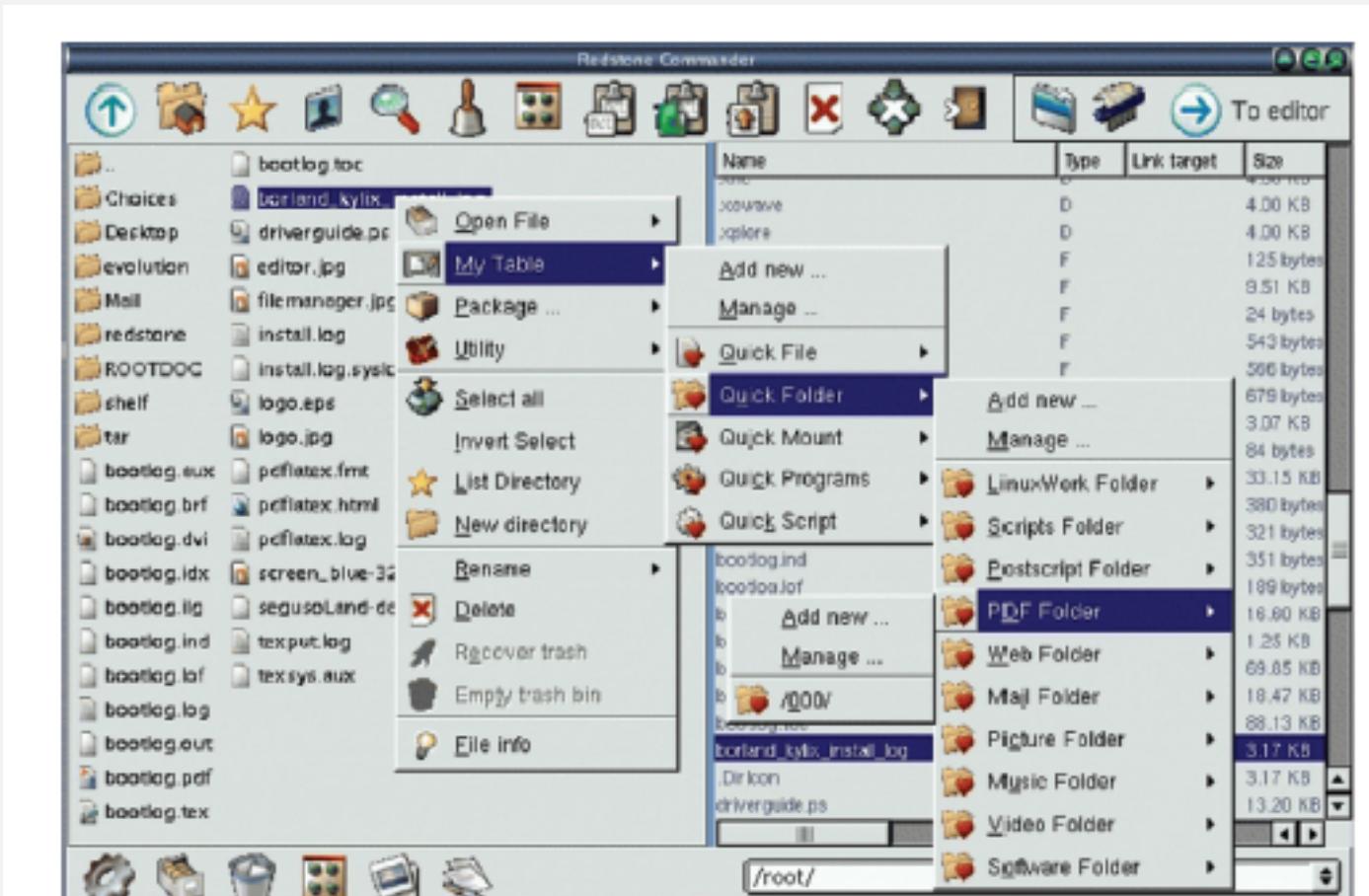


Figure 6.7 A cascading menu

Contextual menus

Provide access to often-used commands that make sense in the context of a current task

Appear when the user presses the Control key while clicking on an interface element

- e.g., clicking on a photo in a website together with holding down the Control key results in options ‘open it in a new window,’ ‘save it,’ or ‘copy it’

Helps overcome some of the navigation problems associated with cascading menus

Windows Jump List Menu

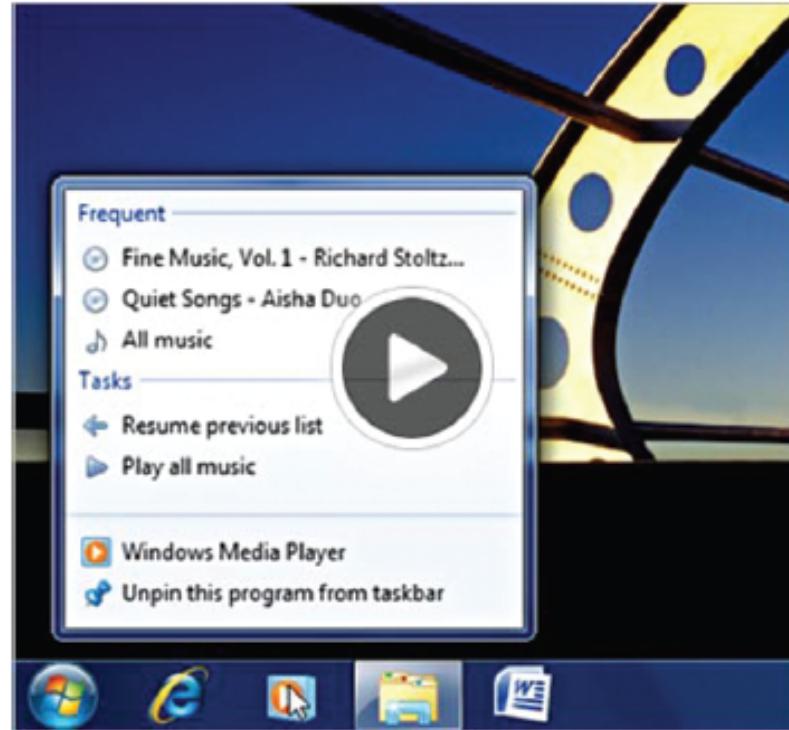


Figure 6.8 Windows jump list

Source: <http://windows.microsoft.com/en-US/windows7/products/features/jump-lists>.

Activity: Menus and Websites

Find a website for each:

- Flat
- Expanding
- Which do you prefer and why?
- 5 minutes

Research and design issues

What are best names/labels/phrases to use?

Placement in list is critical

- Quit and save need to be far apart

Choice of menu to use determined by application and type of system

- flat menus are best for displaying a small number of options at one time
- expanding menus are good for showing a large number of options

Icon design

Icons are assumed to be easier to learn and remember than commands

Can be designed to be compact and variably positioned on a screen

Now pervasive in every interface

- e.g. represent desktop objects, tools (e.g. paintbrush), applications (e.g. web browser), and operations (e.g. cut, paste, next, accept, change)

Icons

Since the Xerox Star days icons have changed in their look and feel:

- black and white -> color, shadowing, photorealistic images, 3D rendering, and animation

Many designed to be very detailed and animated making them both visually attractive and informative

GUIs now highly inviting, emotionally appealing, and feel alive

Early icons

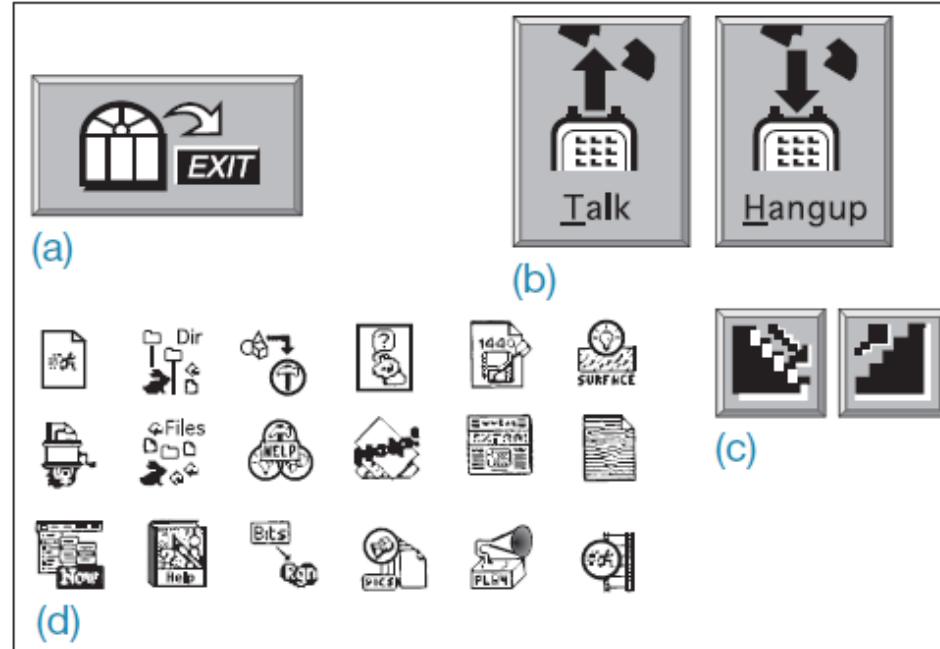


Figure 6.9 Poor icon set from the early 1990s. What do you think they mean and why are they so bad?

Source: K. Mullet and D. Sano: "Designing Visual Interfaces" Pearson 1995, reproduced with permission of Pearson Education.

Newer icons

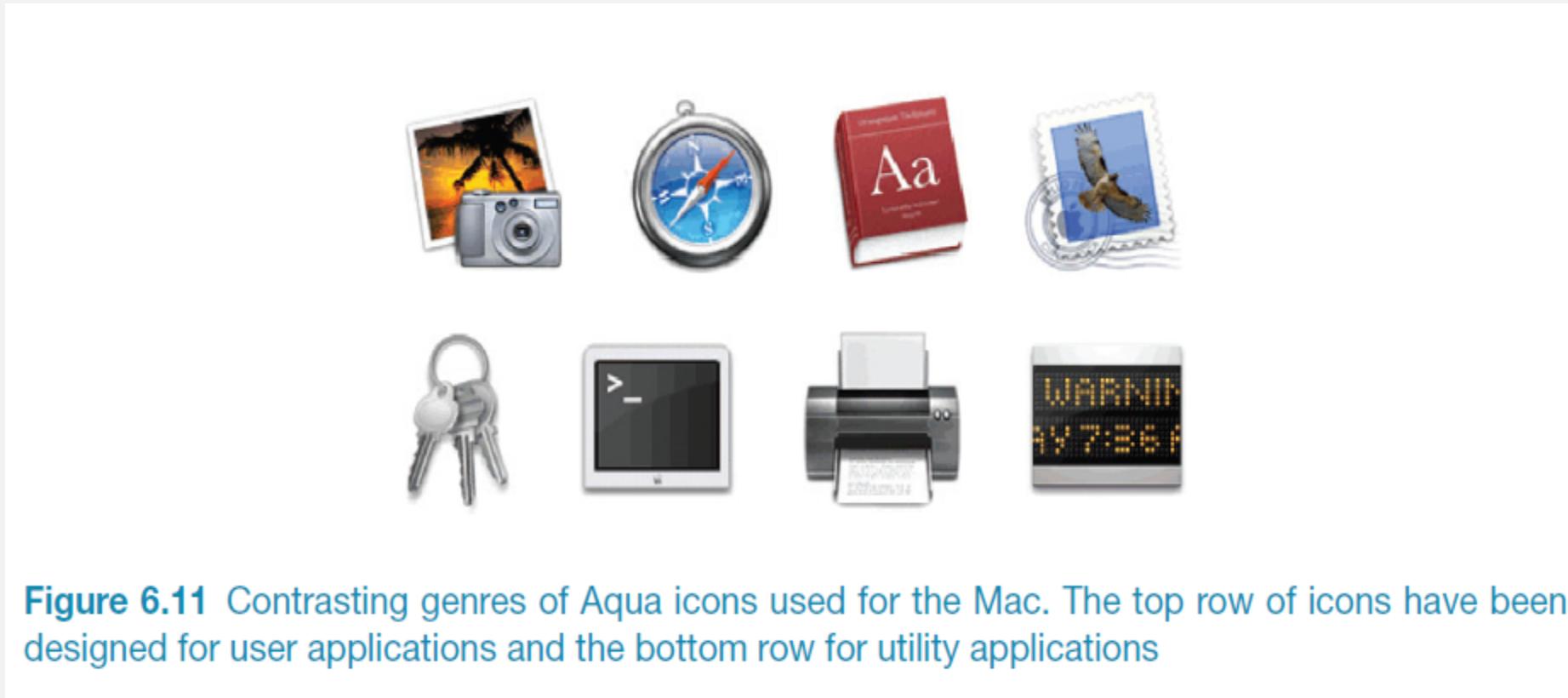
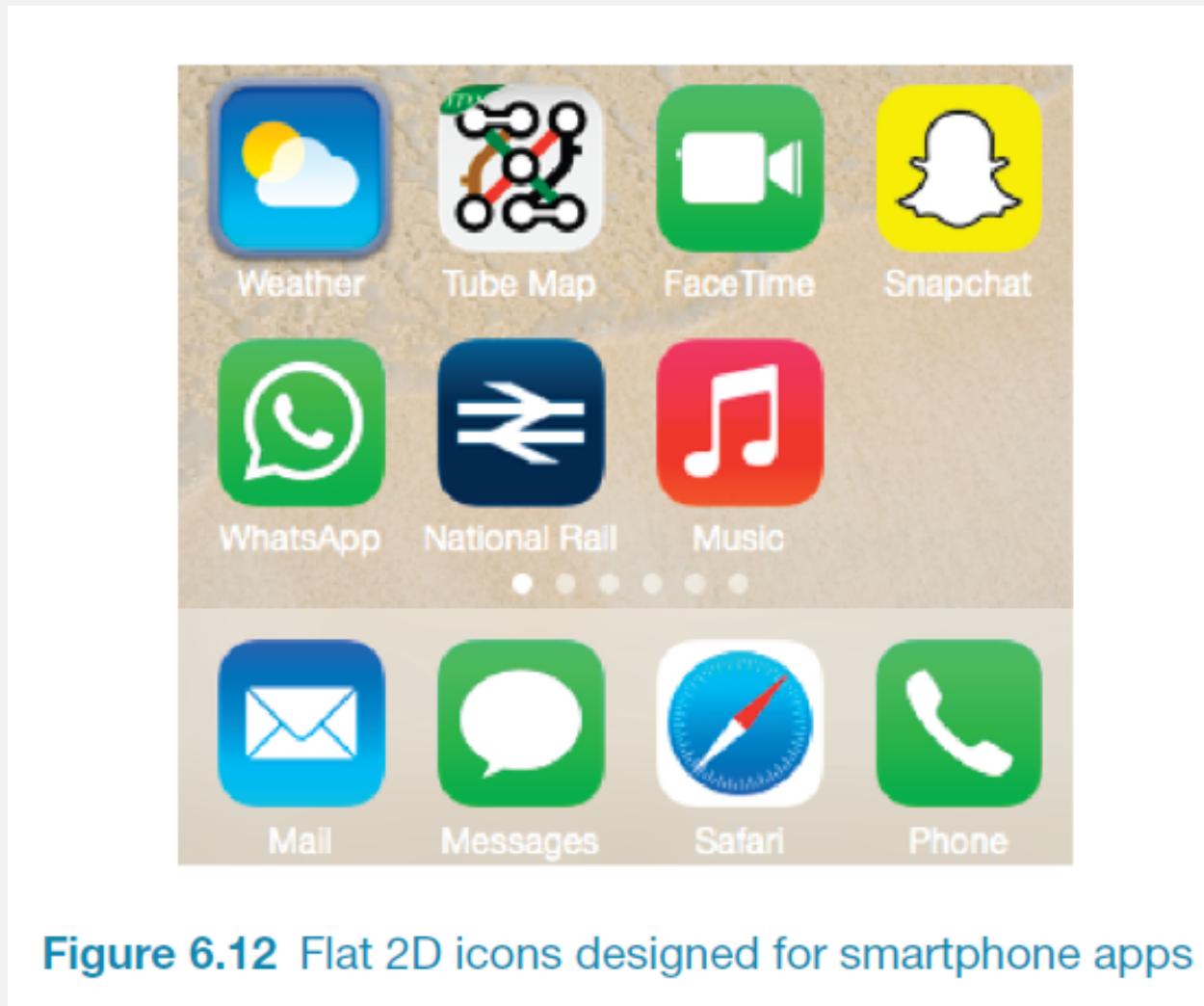


Figure 6.11 Contrasting genres of Aqua icons used for the Mac. The top row of icons have been designed for user applications and the bottom row for utility applications

Simple flat 2D icons



Activity

Sketch simple icons to represent the following operations to appear on a digital camera screen:

- Turn image 90 degrees sideways
- Auto-enhance the image
- Fix red-eye
- Crop the image

Show them to someone else and see if they can understand what each represents

Research and design issues

There is a wealth of resources now so do not have to draw or invent new icons from scratch

- guidelines, style guides, icon builders, libraries

Text labels can be used alongside icons to help identification for small icon sets

For large icon sets (e.g. photo editing or word processing) use rollovers

3. Multimedia

Combines different media within a single interface with various forms of interactivity

- graphics, text, video, sound, and animations

Users click on links in an image or text

- > another part of the program
- > an animation or a video clip is played
- > can return to where they were or move on to another place

4. Virtual reality

Computer-generated graphical simulations providing:

- “the illusion of participation in a synthetic environment rather than external observation of such an environment” (Gigante, 1993)

Provide new kinds of experience, enabling users to interact with objects and navigate in 3D space

Create highly engaging user experiences

Pros and cons

Can have a higher level of fidelity with objects they represent compared to multimedia

Induces a sense of presence where someone is totally engrossed by the experience

- “a state of consciousness, the (psychological) sense of being in the virtual environment” (Slater and Wilbur, 1999)

Provides different viewpoints: 1st and 3rd person

Head-mounted displays are uncomfortable to wear, and can cause motion sickness and disorientation

Which is the most engaging game of Snake?

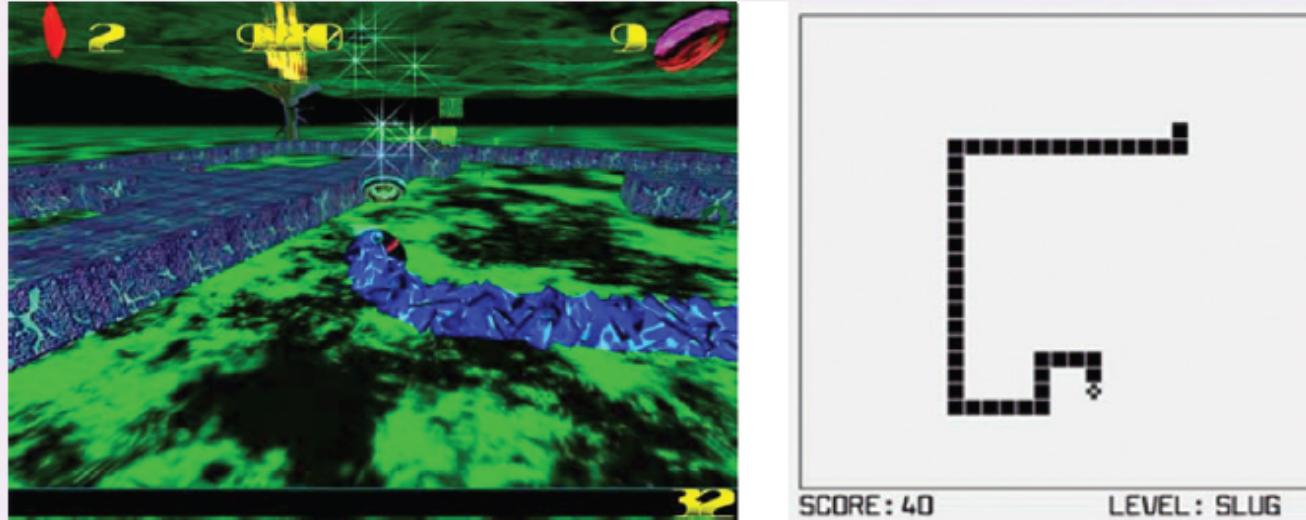


Figure 6.16 Two screenshots from the game Snake – the one on the left is played on a PC and the one on the right on a cell phone. In both games, the goal is to move the snake (the blue thing and the black squares, respectively) towards targets that pop up on the screen (e.g. the bridge, the star) and to avoid obstacles (e.g. a flower, the end of the snake's tail). When a player successfully moves his snake head over or under a target, the snake increases its length by one blob or block. The longer the snake gets, the harder it is to avoid obstacles. If the snake hits an obstacle, the game is over. On the PC version there are lots of extra features that make the game more complicated, including more obstacles and ways of moving. The cell phone version has a simple 2D bird's eye representation, whereas the PC version adopts a 3D third-person avatar perspective

Dashboards

Show screenshots of data updated over periods of time - to be read at a glance

Usually not interactive - slices of data that depict current state of a system or process

Need to provide digestible and legible information for users

- design its spatial layout so intuitive to read when first looking at it
- should also direct a user's attention to anomalies or unexpected deviations

Which dashboard is best?



(a)

Figure 6.18 Screenshots from two dashboards: (a) British Airways frequent flier club that shows how much a member has flown since joining them, and (b) London City that provides various information feeds. Which is the easier to read and most informative?

Which dashboard is best?



Figure 6.18 Screenshots from two dashboards: (a) British Airways frequent flier club that shows how much a member has flown since joining them, and (b) London City that provides various information feeds. Which is the easier to read and most informative?

Go meet your teams....

Teams are posted on canvas.

Start idea generation for project.....

Reading for next class...

pg. 186-223