

Chapter 7:

Interface Design

Click User Experience Website Screenshot:

- Header:** Home, About, Services, Contact.
- Section 1:** **The Right Questions.** Quality Research. Actionable Results. (Background image of gears).
- Section 2:** You need to know that you're making smart decisions. You need information to help you shrink your costs, grow your income, and catapult your business to new growth.
- Section 3:** Whatever phase your product is in, we can help.
 - Planning & Ideation:** Custom customer insight to inform product planning and ideation.
 - Design & Development:** Evaluate the usability of your product before launch.
 - Completed Product:** Evaluate and improve your completed product.

Riyad Capital Mobile Application Screenshot:

- Header:** رياض الرؤاين.
- Navigation:** المصرفية عبر الانترنت, التوقيع للدولار, تجارة الريال, توقيع القيمة, توقيع للسيارة عمر, الاسرارات, التوقيع للدولار, توقيع بطاقة الائتمان, توقيع للدولار, توقيع بطاقة الائتمان, توقيع للدولار, توقيع بطاقة الائتمان.
- Content:**
 - الأخبار الاقتصادية:** للحصول على بطاقات ائتمان أو بولي شخصي أو بولي عقار أو بطاقات الخصم بـ RIE.
 - أخبار بنك الرياض:** أخبار بنك الرياض.
 - الخدمات:** تطبيقات المصرفية عبر الانترنت.
 - الخدمات:** تطبيقات المصرفية عبر الانترنت.
 - الخدمات:** تطبيقات المصرفية عبر الانترنت.
 - الخدمات:** تطبيقات المصرفية عبر الانترنت.

Amazon.com Product Page Screenshot:

- Header:** amazon.com, Hello, Sign in to get personalized recommendations. New customer? Start here.
- Left Sidebar:** Search, All Departments.
- Product Image:** New Kindle, New Lower Price.
- Text:** Introducing our newest Kindle with global wireless. 3G wireless means books in less than 60 seconds. No signal fees, service plan or hunting for WiFi hotspots. New lower price of \$379.
- Call-to-Action:** Order now.
- Related Products:**
 - Chuck This Out: Yellowstone National Park Guidebook: The Complete Traveler's Guide to Yellowstone National Park
 - Star Wars: The Young Readers Collection
 - Call of Duty: Modern Warfare 2 for PlayStation 3
 - I Dreamed a Dream: Julie Covington

Objectives

- ◆ Understand key user interface design principles.
- ◆ Understand the different interaction styles and understand when these styles are most appropriate.
- ◆ Understand when to use graphical and textual presentation of information

Why is interface design important?

- ◆ Link between system functions & users
- ◆ Critical for system dependability
 - ◆ “User errors” → user interfaces do not consider the capabilities of real users and the context of use



Human Factors Engineering

- ◆ The integration of human characteristics into system definition, design, development, and evaluation to optimise human-machine performance under operational conditions.
- ◆ Human Factor → a physical or cognitive property of an individual or social behavior which can influence interacting with technological systems.

Activity

Short -Term Memory

Take a look at these images for 15 seconds..

Activity

Short -Term Memory

On a piece of paper write down what you remember.

How many items did you remember?

Average = 7+/-2

Human factors in interface design

- ◆ **Limited short-term memory**

- ◆ People can instantaneously remember about 7 items of information. If you present more than this, they are more liable to make mistakes.

- ◆ **People make mistakes**

- ◆ When people make mistakes and systems go wrong, inappropriate alarms and messages can increase stress and hence the likelihood of more mistakes.

- ◆ **People are different**

- ◆ People have a wide range of physical capabilities. Designers should not just design for their own capabilities.

- ◆ **People have different interaction preferences**

- ◆ Some like pictures, some like text.

What do you think makes a good interface?

Examine the interfaces in your handout;
share your thoughts with the class..

User Interface Design Principles

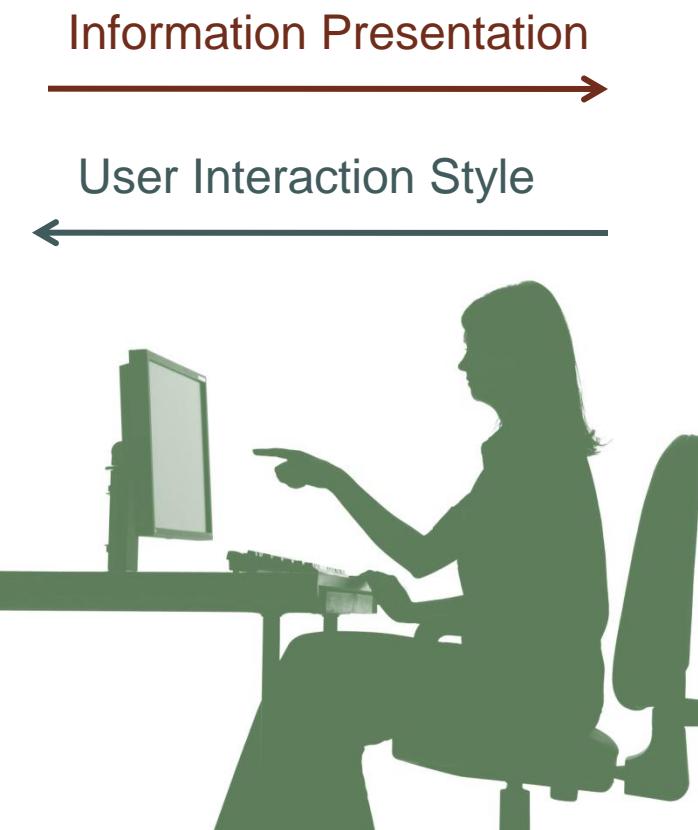
Principle	Description
User familiarity	The interface should use terms and concepts which are drawn from the experience of the people who will make most use of the system.
Consistency	The interface should be consistent in that, wherever possible, comparable operations should be activated in the same way.
Minimal surprise	Users should never be surprised by the behaviour of a system.
Recoverability	The interface should include mechanisms to allow users to recover from errors. <ol style="list-style-type: none">1. Confirmation of destructive actions2. Undo3. Check-pointing
User guidance	The interface should provide meaningful feedback when errors occur and provide context-sensitive user help facilities.
User diversity	The interface should provide appropriate interaction facilities for different types of system user.

Design Issues

Designers of user interfaces are faced with two key questions:

- ◆ How should the user interact with the system?
- ◆ How should information from the computer system be presented to the user?

→ Read pg 366-376 in your textbook



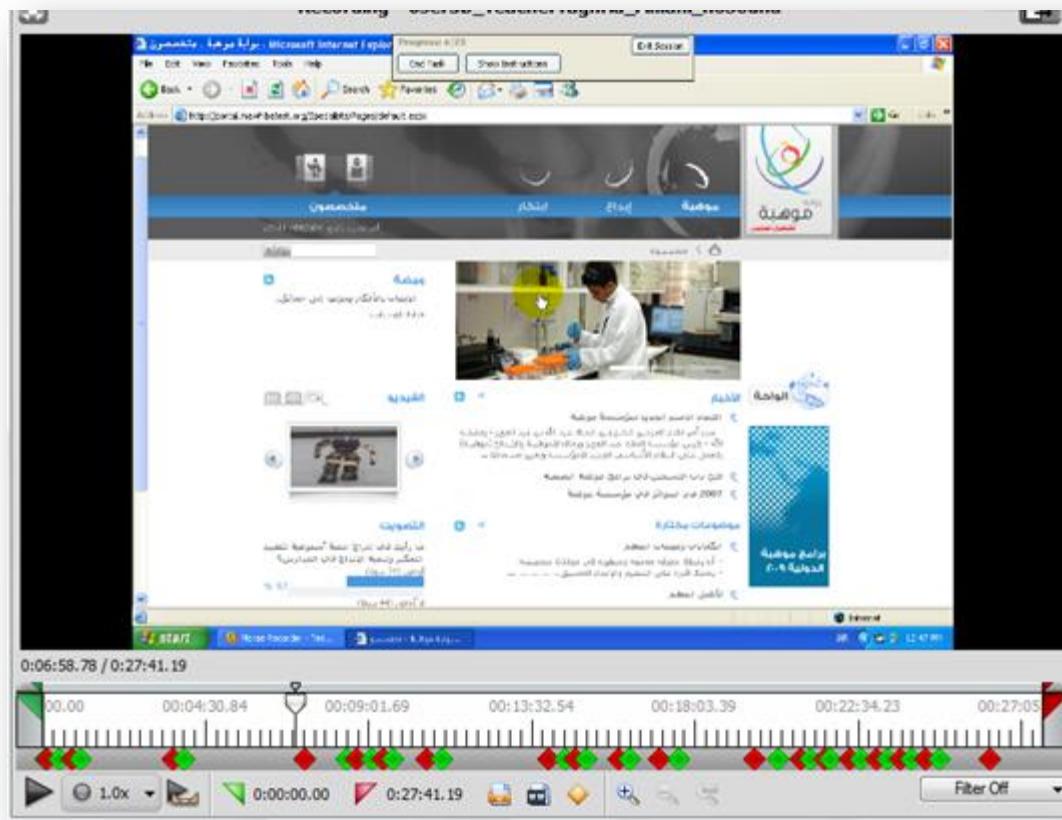
Interaction Styles



All the ways that users can interact with computers..

Interaction Design

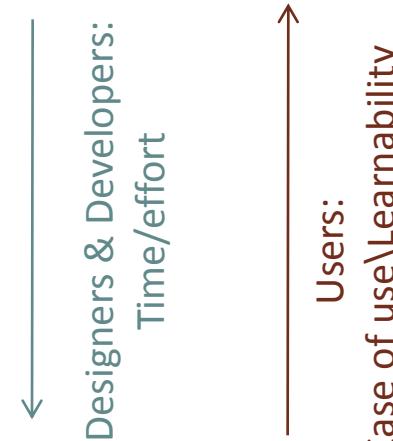
HCI Video: Mouse movements, Eye movements, Facial expressions, In-Session user feedback on the design



Interaction Styles

All the ways that users can interact with computers..

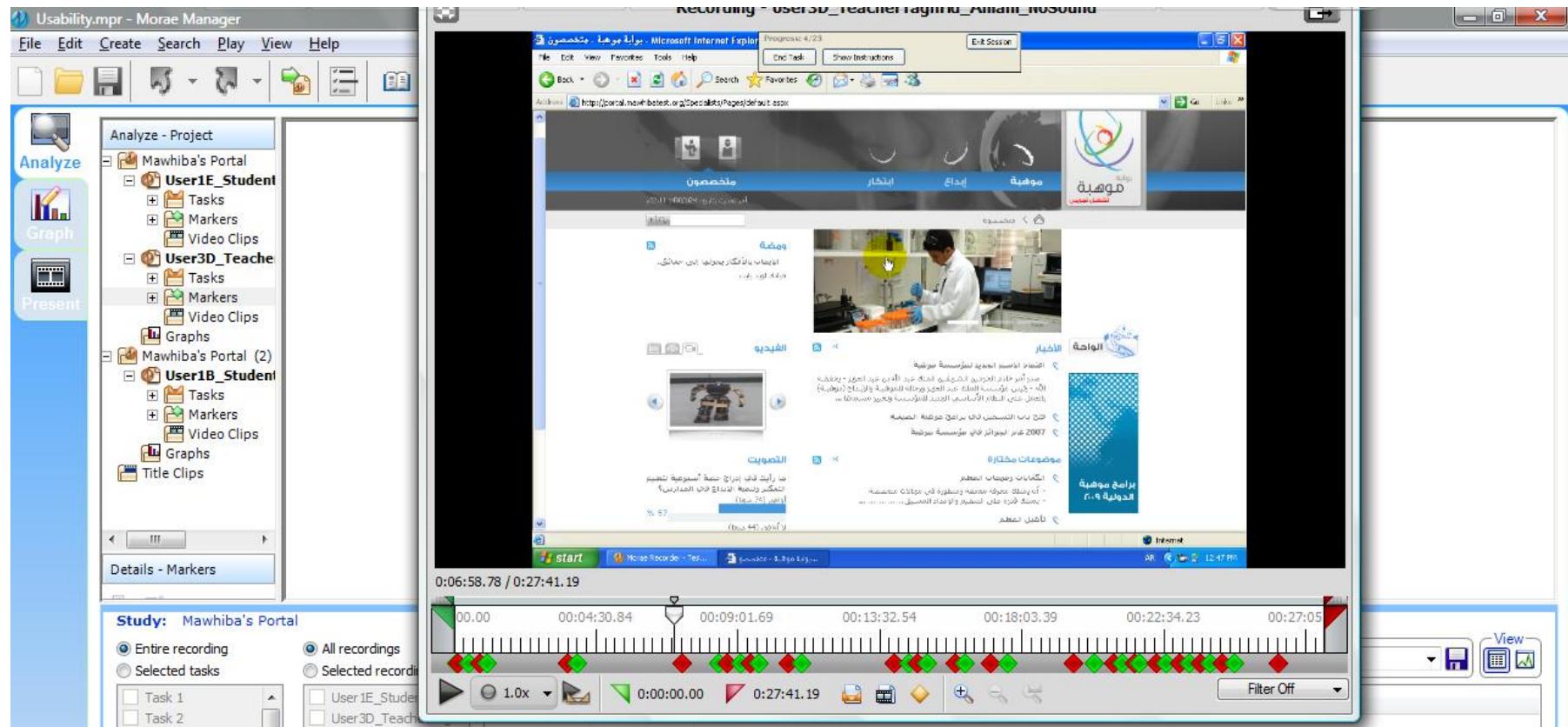
- ◆ Command language
- ◆ Menu selection
- ◆ Form fill-in
- ◆ Direct manipulation
- ◆ Natural language



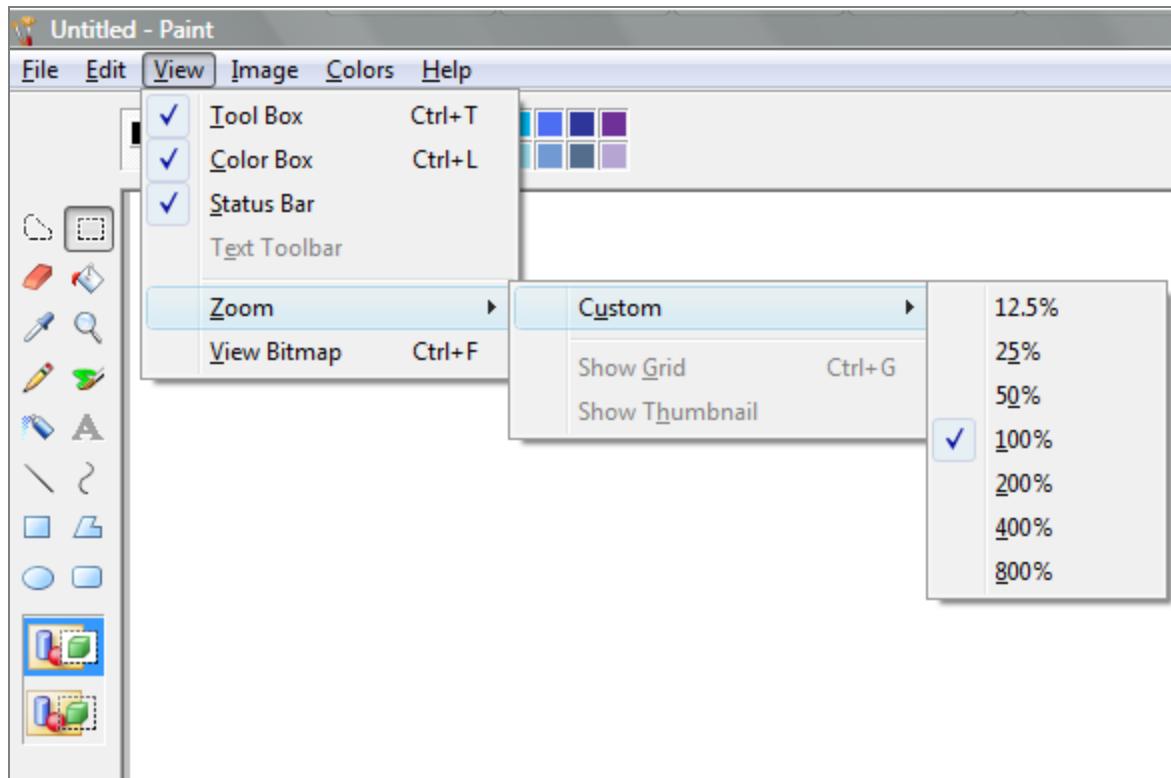
What do you think are the advantages and disadvantages of each method?

Take a look at the following examples..

Interaction Styles: Direct Manipulation



Interaction Styles: Menu Selection



Interaction Styles: Form Fill-in

PINE 3.96 ADDRESS BOOK (Edit)

Nickname : NBA
Fullname : Players in the NBA
Fcc :
Comment :
Addresses : mjordan@nba.com,
kmalone@nba.com,
drobinson@aol.com█

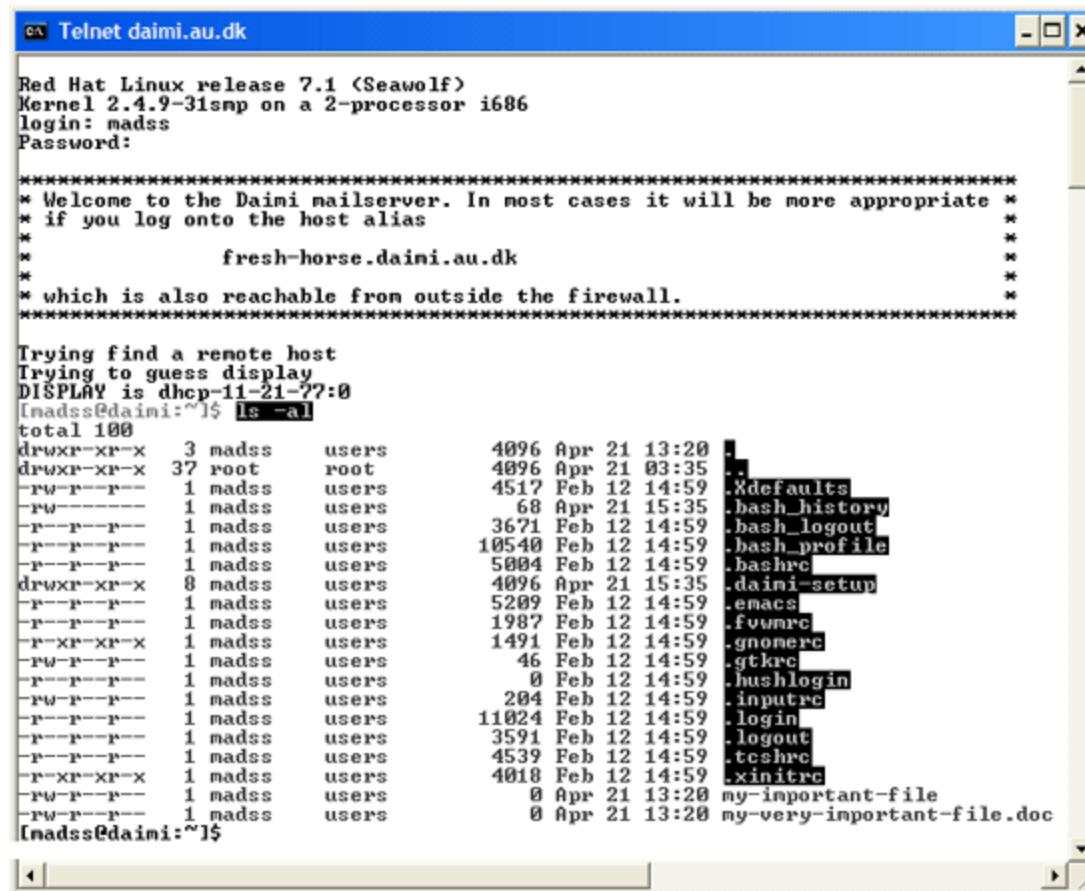
^G Get Help ^X eXit/Save ^R RichView ^Y PrvPg/Top
^C Cancel ^U NxtPg/End

Name:

Address:

City: State: Zip:

Interaction Styles: Command Language



The screenshot shows a terminal window titled "Telnet daimi.au.dk". The session starts with system information: "Red Hat Linux release 7.1 (Seawolf)", "Kernel 2.4.9-31smp on a 2-processor i686", and a login prompt for "madss". The password is not shown. A welcome message from the mailserver follows, mentioning "fresh-horse.daimi.au.dk" and noting it's reachable from outside the firewall. The user then runs the command "ls -al" to list the contents of the current directory. The output shows a long list of files and their details, including names like ".xinitrc", ".xsession", ".xsession-errors", ".xtermrc", ".gnomerc", ".fvwmrc", ".bashrc", ".bash_history", ".bash_logout", ".bash_profile", ".daimi-setup", ".emacs", ".inputrc", ".login", ".logout", and ".my-very-important-file.doc". The file ".my-very-important-file.doc" is highlighted with a yellow background.

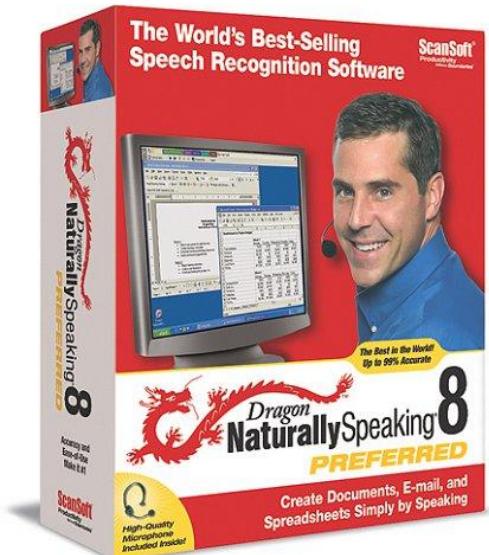
```
Red Hat Linux release 7.1 (Seawolf)
Kernel 2.4.9-31smp on a 2-processor i686
login: madss
Password:

*****
* Welcome to the Daimi mailserver. In most cases it will be more appropriate *
* if you log onto the host alias                                              *
*                                              *
*          fresh-horse.daimi.au.dk                                              *
*                                              *
* which is also reachable from outside the firewall.                          *
*****


Trying find a remote host
Trying to guess display
DISPLAY is dhcp-11-21-77:0
[madss@daimi:~]$ ls -al
total 100
drwxr-xr-x  3 madss    users        4096 Apr 21 13:20 .
drwxr-xr-x  37 root     root        4096 Apr 21 03:35 ..
-rw-r--r--  1 madss    users       4517 Feb 12 14:59 .xdefaults
-rw-r--r--  1 madss    users       68 Apr 21 15:35 .bash_history
-rw-r--r--  1 madss    users      3671 Feb 12 14:59 .bash_logout
-rw-r--r--  1 madss    users      10540 Feb 12 14:59 .bash_profile
-rw-r--r--  1 madss    users      5004 Feb 12 14:59 .bashrc
drwxr-xr-x  8 madss    users        4096 Apr 21 15:35 .daimi-setup
-rw-r--r--  1 madss    users      5209 Feb 12 14:59 .emacs
-rw-r--r--  1 madss    users      1987 Feb 12 14:59 .fvwmrc
-rw-r--r--  1 madss    users      1491 Feb 12 14:59 .gnomerc
-rw-r--r--  1 madss    users       46 Feb 12 14:59 .gtkrc
-rw-r--r--  1 madss    users       0 Feb 12 14:59 .hushlogin
-rw-r--r--  1 madss    users      204 Feb 12 14:59 .inputrc
-rw-r--r--  1 madss    users     11024 Feb 12 14:59 .login
-rw-r--r--  1 madss    users      3591 Feb 12 14:59 .logout
-rw-r--r--  1 madss    users      4539 Feb 12 14:59 .tcshtc
-rw-r--r--  1 madss    users      4018 Feb 12 14:59 .xinitrc
-rw-r--r--  1 madss    users       0 Apr 21 13:20 my-important-file
-rw-r--r--  1 madss    users       0 Apr 21 13:20 my-very-important-file.doc
[madss@daimi:~]$
```

Interaction Styles: Natural Language

- ◆ Writing commands in natural language, such as '*print the file named abc.doc*'
- ◆ Vocal input (e.g. Dragon Naturally Speaking)



Interaction Styles

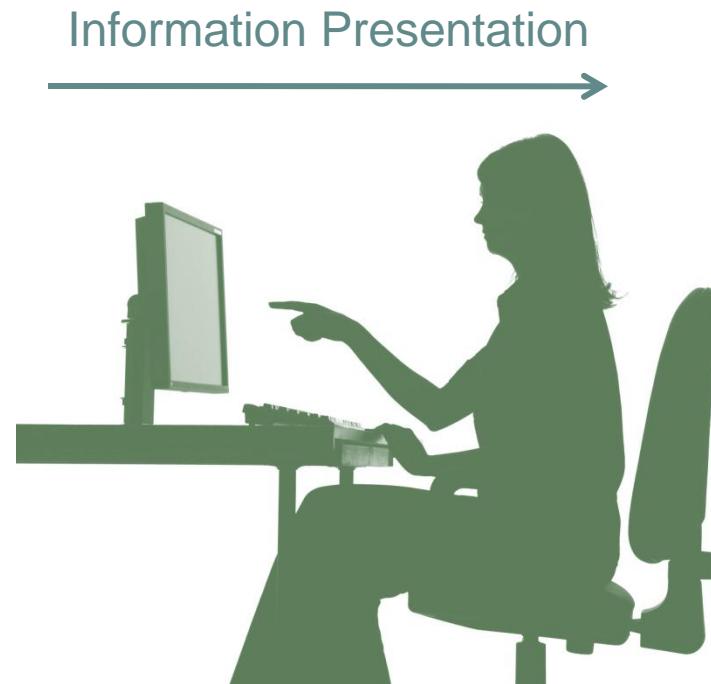
Interaction style	Main advantages	Main disadvantages	Application examples
Direct manipulation	Fast and intuitive interaction Easy to learn	May be hard to implement. Only suitable where there is a visual metaphor for tasks and objects.	Video games CAD systems
Menu selection	Avoids user error Little typing required	Slow for experienced users. Can become complex if many menu options.	Most general-purpose systems
Form fill-in	Simple data entry Easy to learn Checkable	Takes up a lot of screen space. Causes problems where user options do not match the form fields.	Stock control, Personal loan processing
Command language	Powerful and flexible	Hard to learn. Poor error management.	Operating systems, Command and control systems
Natural language	Accessible to casual users Easily extended	Requires more typing. Natural language understanding systems are unreliable.	Information retrieval systems

Interaction Styles: Web-based Interfaces

◆ What user interaction elements might you see on a web-based interface?

The screenshot shows the homepage of Click user experience. The header features the company logo with the word 'Click' in large letters and 'user experience' in smaller letters below it. Below the logo is a navigation bar with links for Home, About, Services, and Contact. The main banner is green and contains the text 'The Right Questions.', 'Quality Research.', and 'Actionable Results.' It also features a graphic of a hand interacting with several interlocking gears. The main content area has a white background. On the left, there's a section about making smart decisions with text and a gear icon. In the center, there's a section about helping products at different stages with text and icons for a speech bubble, a pencil, and a computer cursor. On the right, there's a sidebar with a description of the company as a usability research and design consulting firm located in Seattle, Washington, and links to 'Find out more about us', 'See our list of services', and 'Contact us'. At the bottom, a footer states 'At Click User Experience we help you develop the right questions.'

Information presentation



All the ways that users can view information.

Information display factors

- ◆ Is the user interested in precise information or data relationships?
- ◆ How quickly do information values change?
Must the change be indicated immediately?
- ◆ Must the user take some action in response to a change?
- ◆ Is there a direct manipulation interface?
- ◆ Is the information textual or numeric? Are relative values important?

Data Visualisation

- ◆ Concerned with techniques for displaying large amounts of information.
- ◆ Visualisation can reveal relationships between entities and trends in the data.

Connect with an audience of dozens to millions.

- Stop sending mass emails to everyone.
- Archive your thoughts.
- Why the heck not?

Hot Blogs Today

- [Lorelle on WordPress](#)
- [churumuri](#)
- [Scobleizer - Microsoft Geek Blogger](#)
- [Pomme & Kelly](#)
- [My Journey to Macintosh](#)
- [Sam Ideas, Thoughts, Programming](#)
- [El Blog Oficial de Carlos Sicilia](#)
- [Qwerty Maniac - The Typo Killer](#)
- [Football Videos](#)
- [Nosy Snoop](#)
- [It's a Definite Maybe](#)

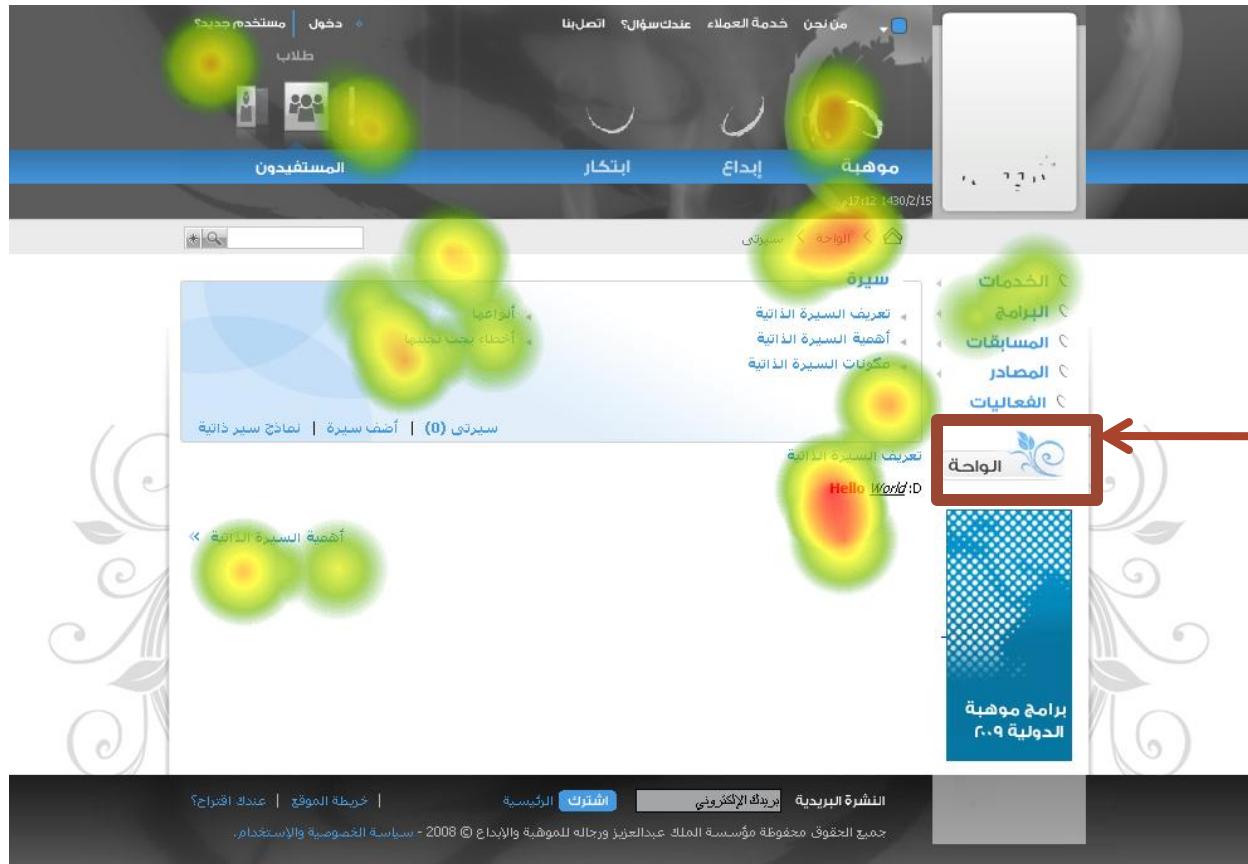
More of the best blogs on WordPress.com.

Saudis Plan Diplomatic Mission to Baghdad	Roberts' seizure spurs court questions	Another Afghan Hostage Deadline Passes	Japan election claims first cabinet casualty
Senator's financial clerk testifies	House Looks for Answers in Tillman Case	More Wildfires Flare Up In Montana	Despite hopeful headlines, Mideast situation is bleak
Democrats seek independent probe of Gonzales	Nominee Mullen: Little political progress in Iraq	Voting Machine Companies Attack Review	Russia downgrades ties with Hamas
House overwhelmingly passes ethics, lobbying bill	'Luckiest guy in the world'	Jim Black Faces State Sentencing	UN joins Darfur force
Cops: PSL women got millions to starve their children she starved	Dr. Rudy's got it covered!	Thompson Raises \$3.46 Million in Presidential Run (Update2)	Cheney backs Iraq war progres
A Turn For The Better In Iraq?	Justine T. Tiel, Marisa Merton, Casey Sean	Clinton's First Presidential Victory of Campaign	Khmer Rouge prison chief is charged
Fires ravage two of Canary Islands	Amber Alert issued for missing child	Barack Obama's First Victory of Campaign	Talibas with Mushtarak to establish democracy: Bhutto
Sunnis Arab Bloc Quits Iraqi Government	Australian man makes first solo circumnavigation	Bob Dole, John McCain, John Edwards	Australian man makes first solo circumnavigation

Wednesday August 1, 2007 12:49

Data Visualisation

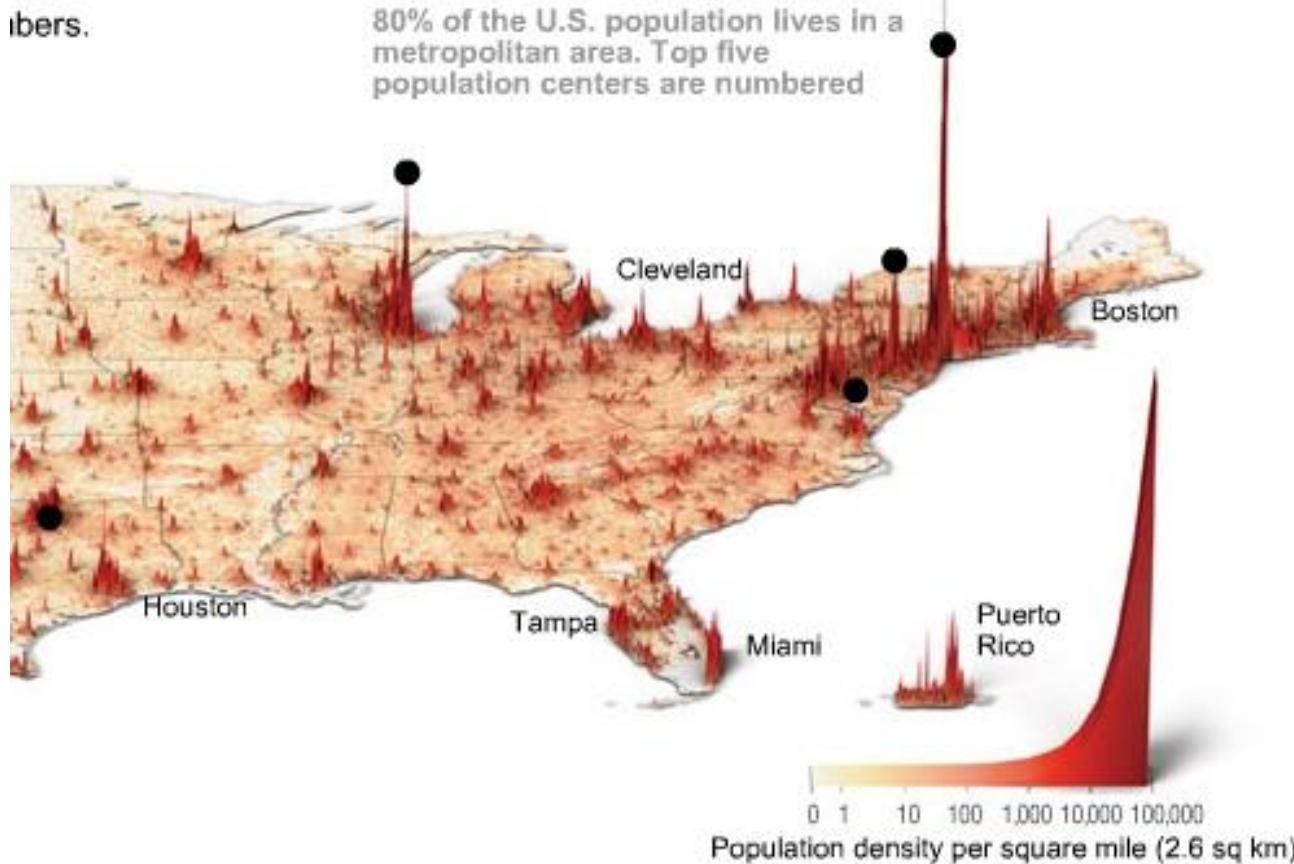
- ◆ Visualisation can reveal trends in user behaviour in interacting with systems.



Data Visualisation

bers.

80% of the U.S. population lives in a metropolitan area. Top five population centers are numbered



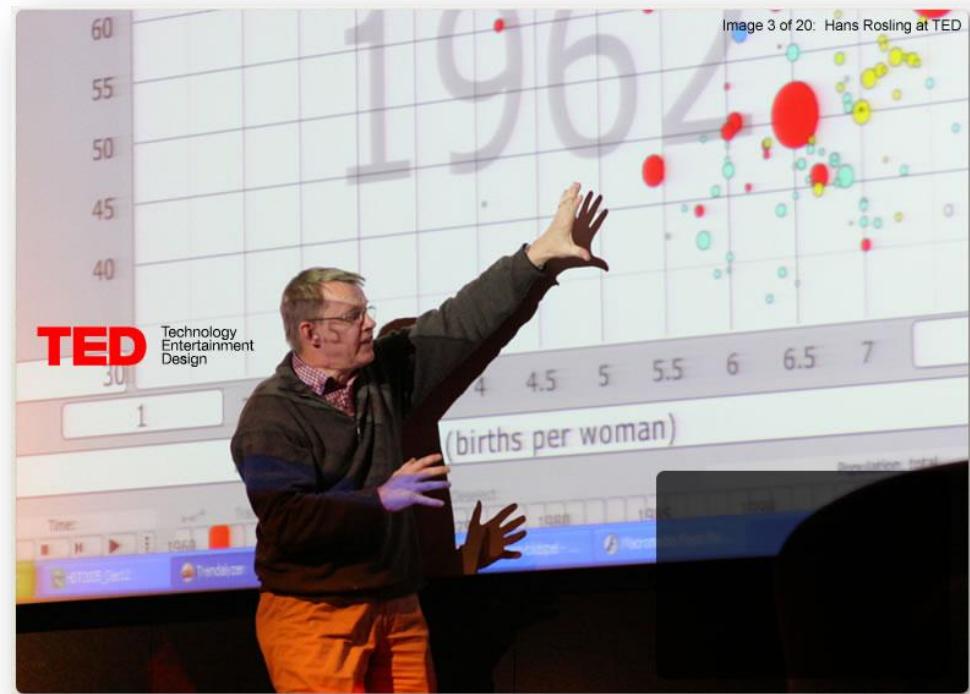
Data Visualisation

- ◆ Gapminder
 - ◆ <http://www.gapminder.org>
- ◆ Web pages as graph
 - ◆ <http://www.aharef.info/static/htmlgraph/>
- ◆ CrazyEgg
 - ◆ <http://crazyegg.com/>
- ◆ Time magazine
 - ◆ http://www.time.com/time/covers/20061030/where_we_live/

Data Visualisation

- ◆ Bonus assignment:

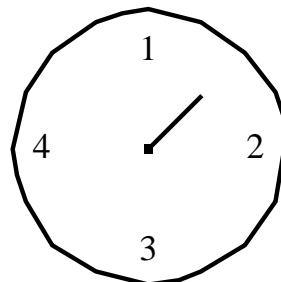
Watch Hans Rosling's TED presentation and write a review/summary of your thoughts on data visualisation.



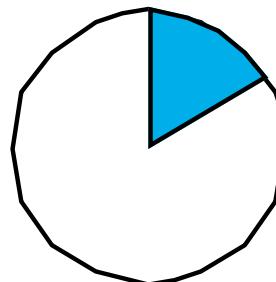
http://www.ted.com/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen.html

Data Visualisation

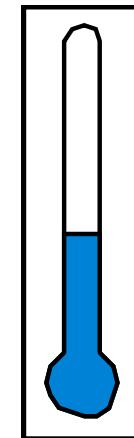
Presentation methods



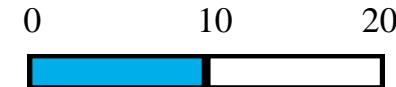
Dial with needle



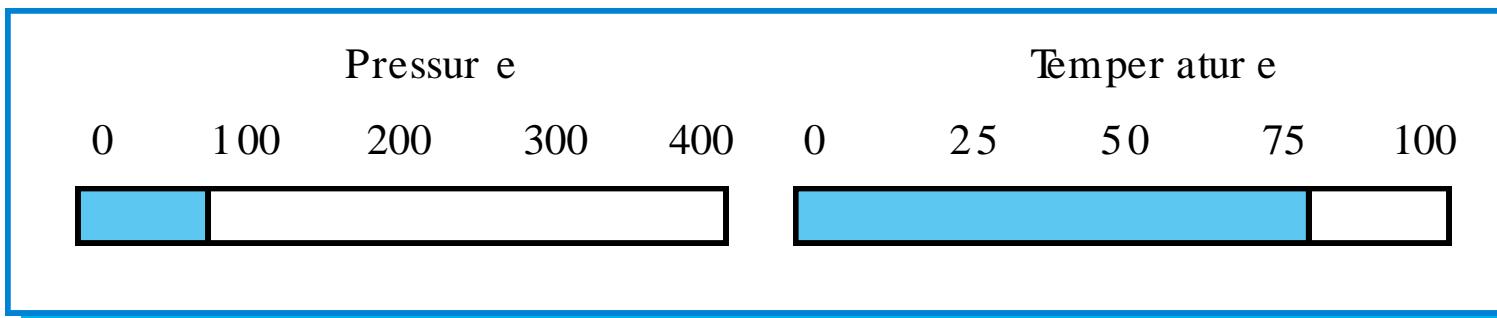
Pie chart



Thermometer



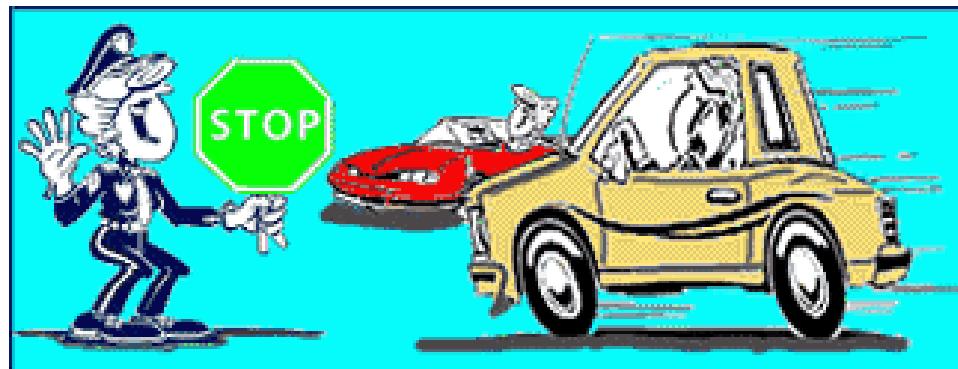
Horizontal bar



Interface Design: Colors

- ◆ Colour adds an extra dimension to an interface and can help the user understand complex information structures.
- ◆ Colour can be used to highlight exceptional events.

Green stop sign?

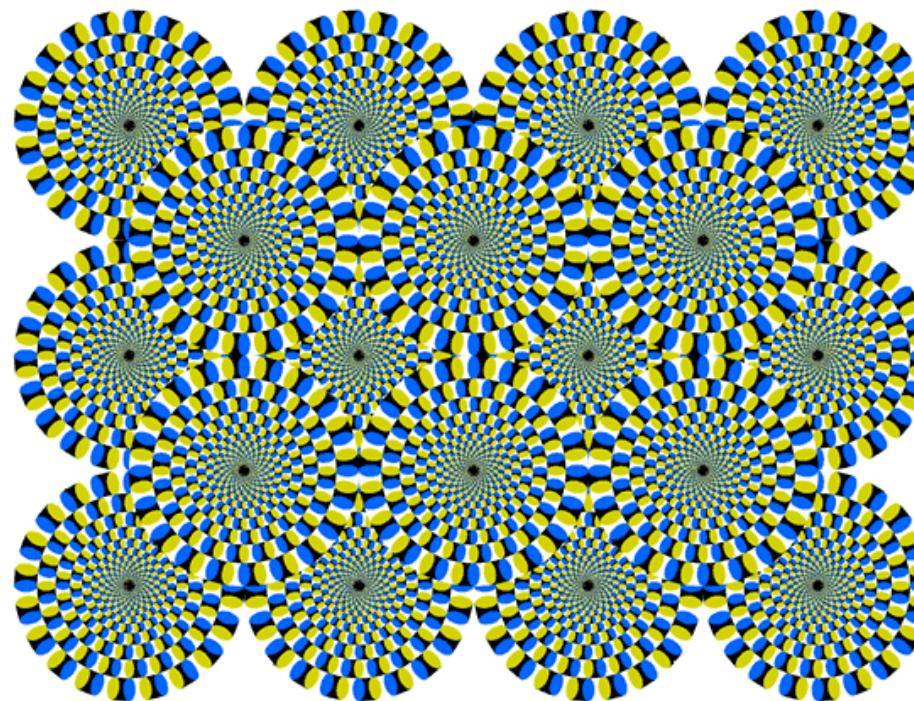


Interface Design: Colors

◆ Common mistakes in the use of colour in interface design is the over-use of colour in the display.



Interface Design: Colors



Akiyoshi Kitaoka, *Rotating Snakes* (2003).

This picture by Kitaoka appears to move due to the luminance contrast between the black, blue, white, and yellow.

Interface Design: Colors

- ◆ Limit the number of colours used and be conservative in their use.
- ◆ Use colour change to show a change in system status.
- ◆ Use colour coding to support the task that users are trying to perform.
- ◆ Be careful about colour pairings.

Interface Design: Colors

- ◆ Use colour coding in a thoughtful and consistent way.
- ◆ Individual preferences vary; allow users more control over the interface colors.

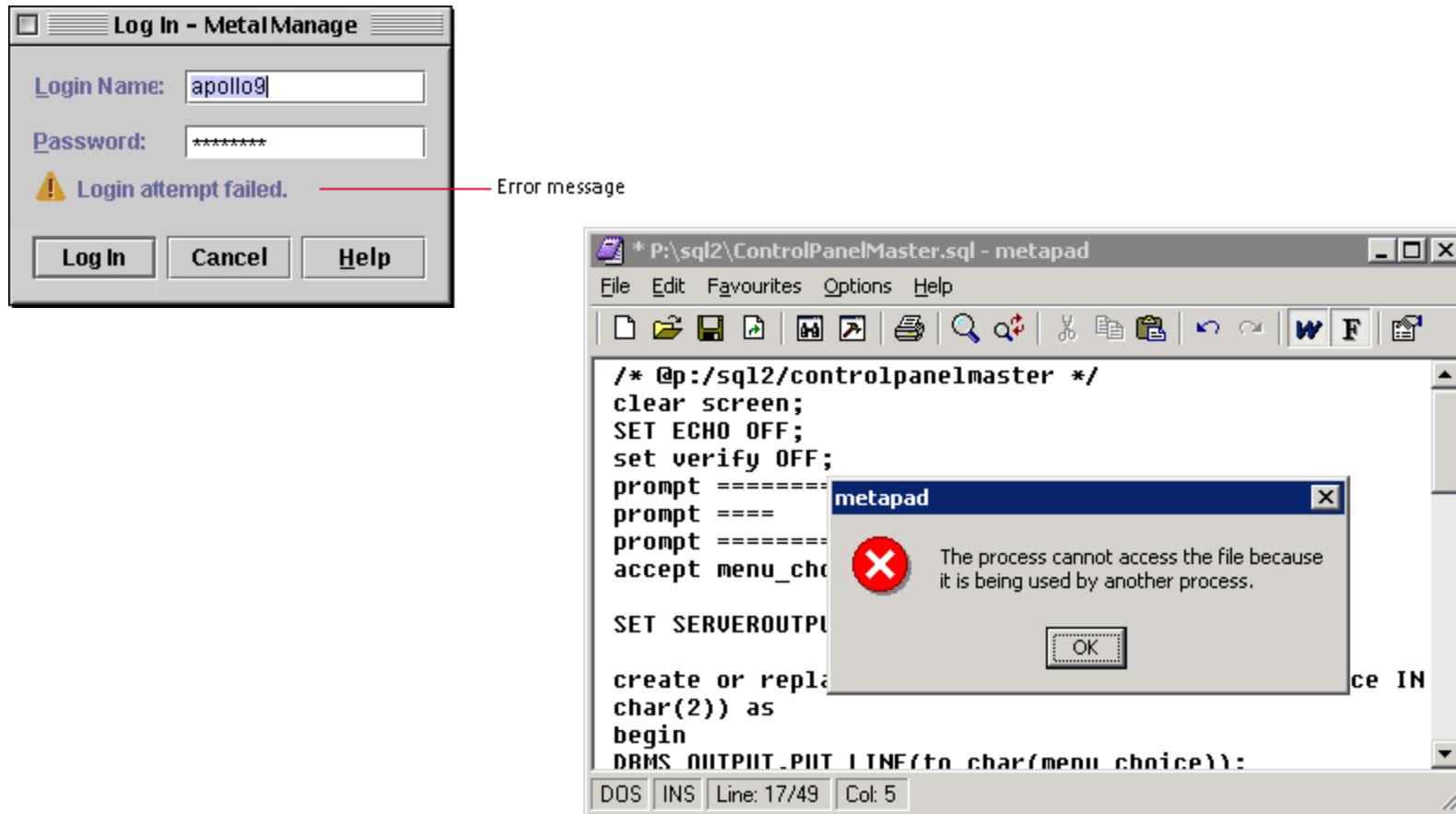
Example: MS Windows Accessibility features or the toolbar on <http://www.dyslexia-parent.com/>



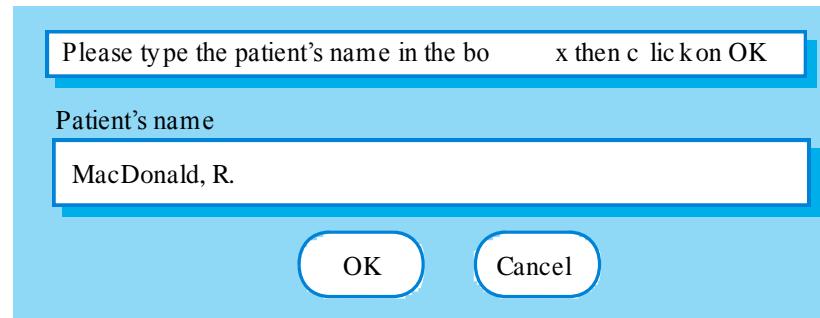
Interface Design: Colors

- ◆ Colour Matters
 - ◆ <http://www.colormatters.com/>
- ◆ Colour combinations:
 - ◆ http://www.webdevelopersnotes.com/design/color_combinations.php3

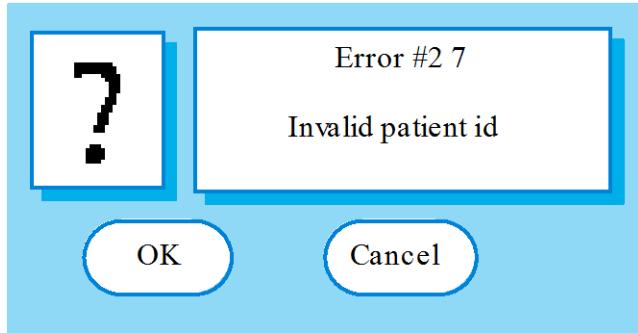
Interface Design: Error Messages



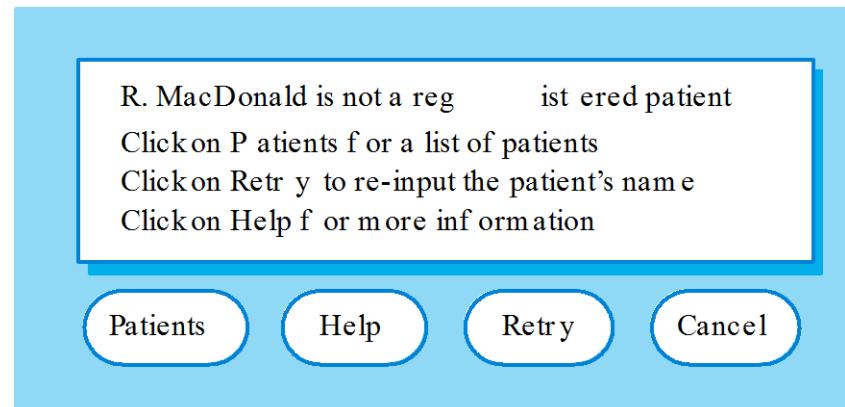
Interface Design: Handling User Errors



System-oriented error message



User-oriented error message



Interface Design: Error Messages

Factor	Description
Context	Wherever possible, the messages generated by the system should reflect the current user context. As far as is possible, the system should be aware of what the user is doing and should generate messages that are relevant to their current activity.
Experience	As users become familiar with a system they become irritated by long, ŒmeaningfulŒ messages. However, beginners find it difficult to understand short terse statements of a problem. You should provide both types of message and allow the user to control message conciseness.
Skill level	Messages should be tailored to the userŒskills as well as their experience. Messages for the different classes of user may be expressed in different ways depending on the terminology that is familiar to the reader.
Style	Messages should be positive rather than negative. They should use the active rather than the passive mode of address. They should never be insulting or try to be funny.
Culture	Wherever possible, the designer of messages should be familiar with the culture of the country where the system is sold. There are distinct cultural differences between Europe, Asia and America. A suitable message for one culture might be unacceptable in another.
