

# CSEN909: Human Computer Interaction

## Lecture 1 (BI)

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*Lecturer, MET*

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# Administrative

## ■ TA: Mennat-Allah Essam

## ■ Marking

### — Assignments

➤ A1      7%

➤ A2      7%

➤ A3      6%

— Project                      30%

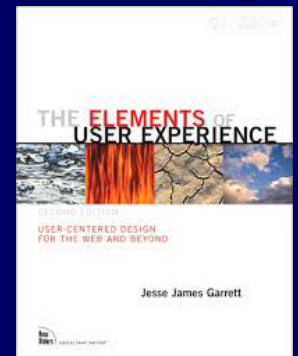
— Midterm                      20%

— Final Exam                      30%

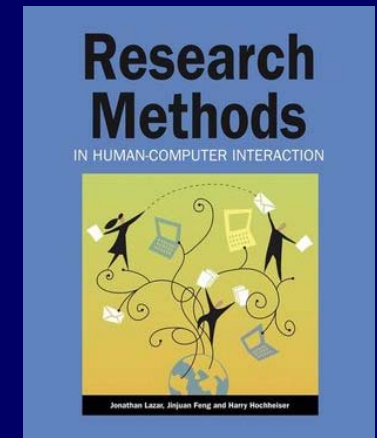
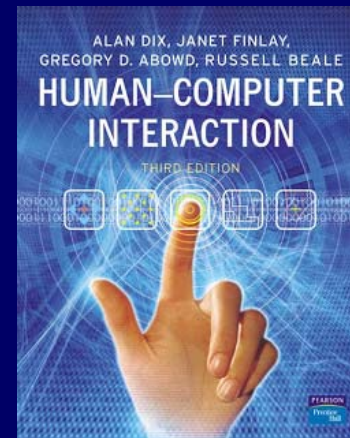
# Course Material

- Lecture slides
- Videos
- Course Text:

<https://www.dropbox.com/s/6ae4njtef07ymxk/elements-of-user-experience.pdf>



- Designated chapters:





# Policies

- Assignments will be posted on the course's web page.
- **Late course work.** You can turn in your assignment up to 2 days late, but this will cost you 20% of the maximum grade for every day you are late (e.g., an assignment turned 2 days late can get a maximum of 6/10). No assignment will be accepted after 2 days, and will be given a grade of 0. If you are struggling with an assignment, talk to the instructor or the TA's for help **before the deadline**.
- The above rule does not apply to presentation to Lecturer. You will get a zero.



# Policies

## ■ Re-marking.

- First, talk to the TA
- The TAs will hold a special remarking session shortly after assignments are handed back to students. Details will be posted on the course newsgroup.
- If you are still dissatisfied after talking to the TA, then email me to set up an appointment.
- **You have up to 7 days from the time the marked assignment is available for hand-back to ask for a re-mark.** No assignment will be re-marked after this period.



# Policies

- **Communications.** Your best bet for getting questions answered quickly is to post to the course discussion board. If you think your question is not appropriate for the newsgroup, feel free to email me. Please make sure to include CSEN909 in the subject line of your email.
- Finally, before you email me, please check the discussion board; your question may have already been answered.



## Reference Material: videos + text

- Will be placed on dropbox
- Link provided in references slide (last one in each lecture).
- Shown and assigned videos are part of the course content. You will be asked questions about them.
- You are responsible to download them – sooner the better (not day of midterm or exam...). If you all do try to download them at the same time, dropbox disables the account and you will be denied access.
- **Videos labeled as supplementary are not part of the course content but you are highly encouraged to watch them on your leisure time to enhance how you think and approach design.**

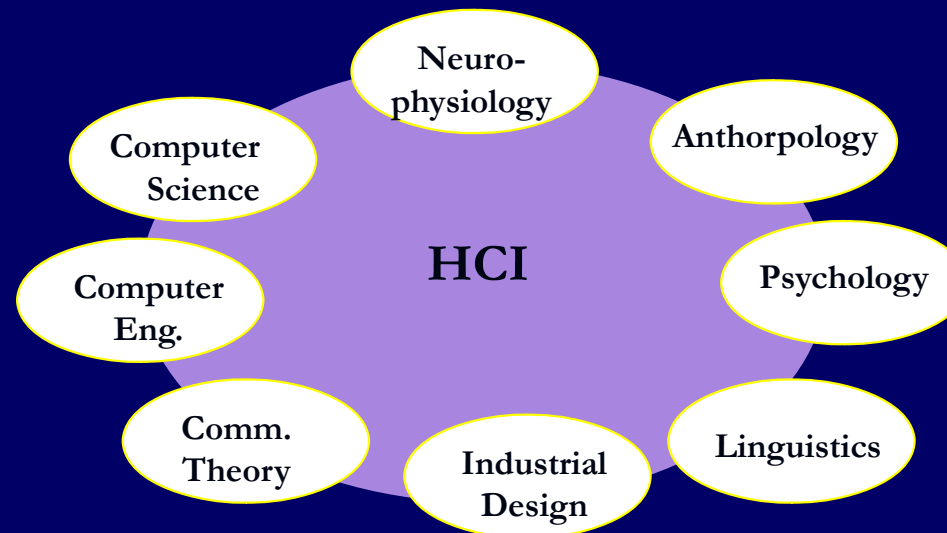


# Course Overview



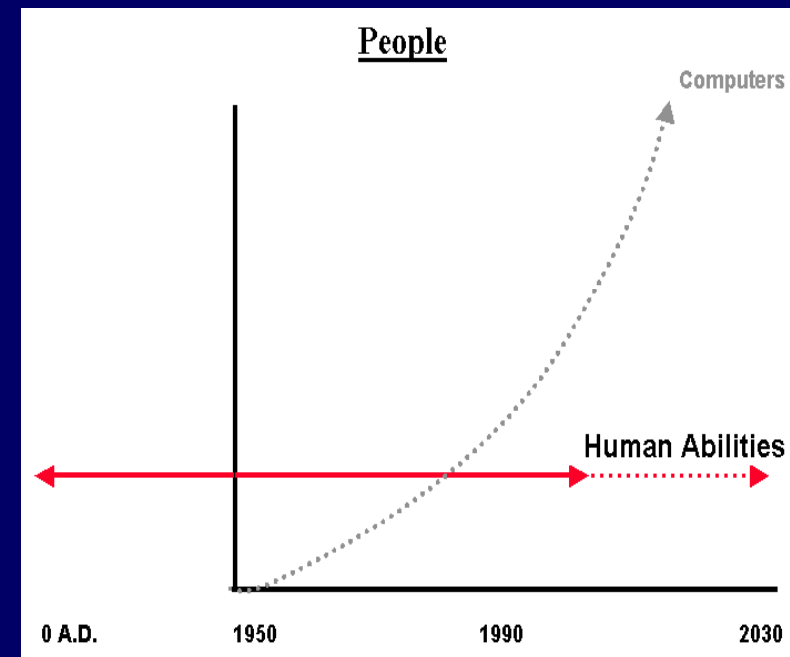
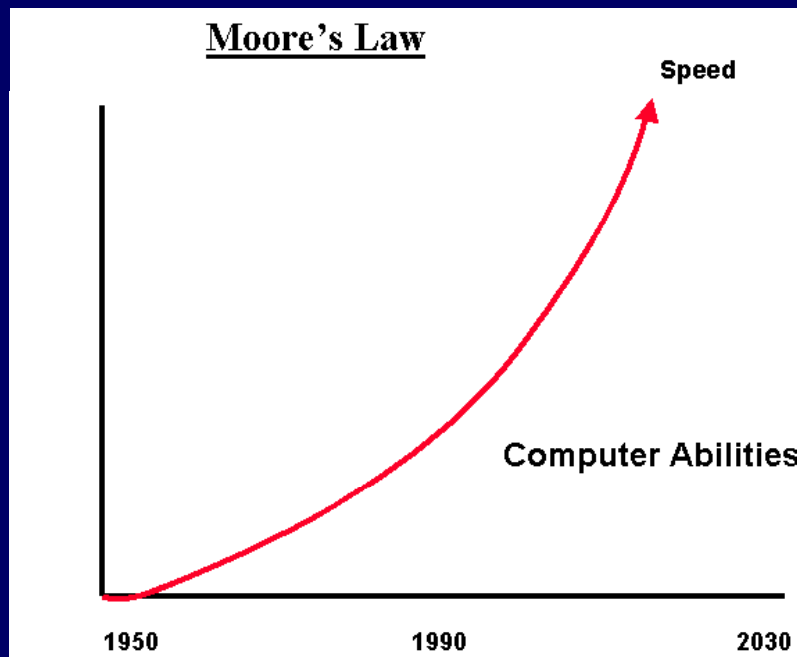
# Human Computer Interaction

- What is it?
  - One of the areas within computer science
  - the study, planning, and design of the interaction between people (users) and computers.
  - Interdisciplinary area;



# HCI is Critical to Product Success

- A critical factor in adoption of technology



- HCI Design is a mix of science, art & skill

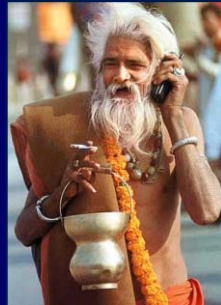


# Importance of an Interface

- **Business and marketing**
  - The success of the Macintosh, Windows 3.1 & iPhone !
  - “User friendly” systems marketing
- **Industry benchmarks**
  - UI consumes nearly 50% of development effort  
(Myers & Rosson, “Survey on user interface programming”, CHI '92)
  - “Usability” — 20-40% of software review criteria
- **Productivity and safety**
  - Productivity improvements, or lack thereof

# Factors influencing HCI Design & Evaluation

- User, Goal, Effectiveness, Efficiency, Satisfaction, Context





# Course Contents

- User Interface Evaluation
- User Interface Design
- Research Frontiers



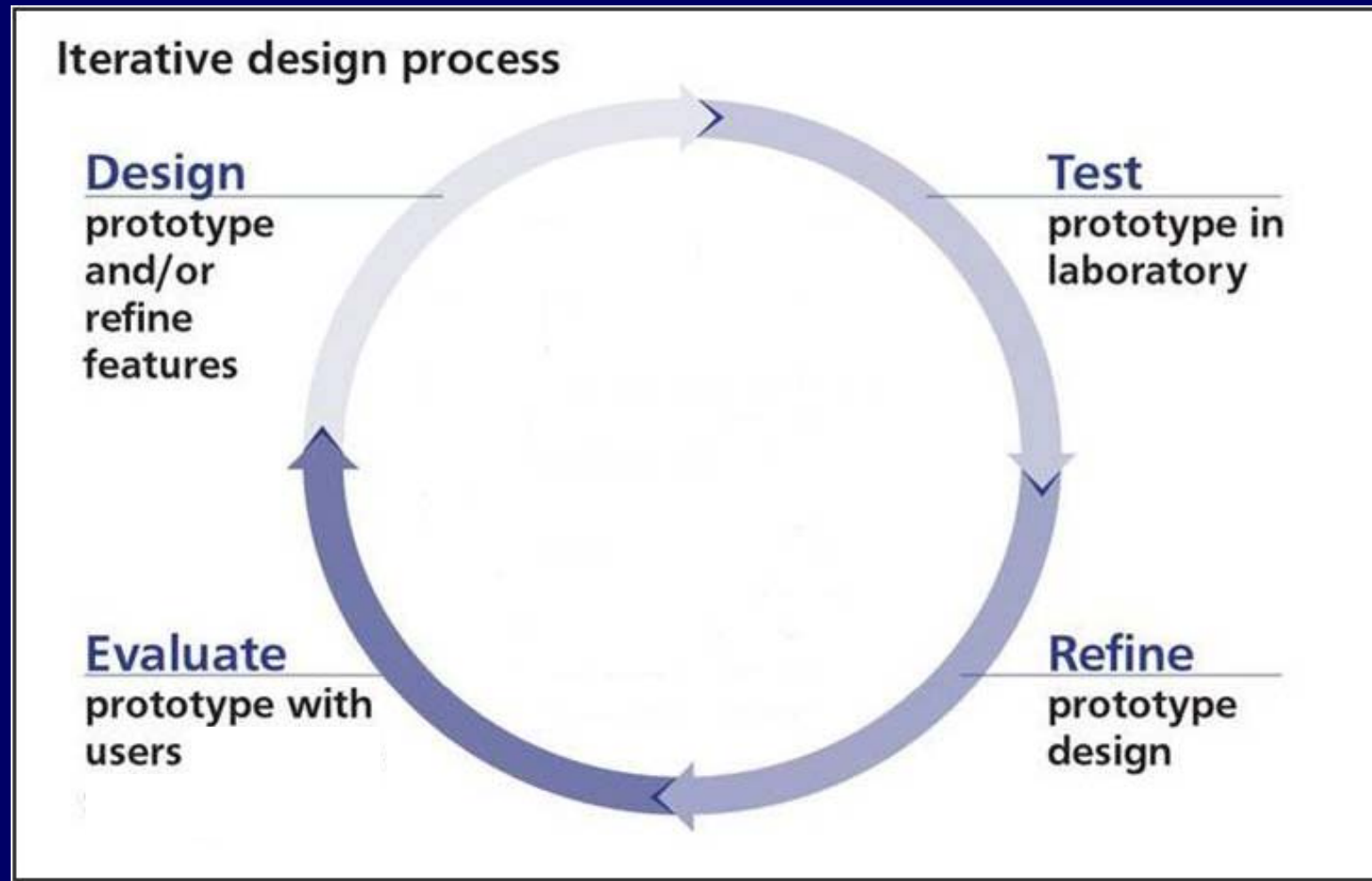
# How to become a good designer?



# How to become a good designer?

- A good designer is one that makes as little mistakes as possible. Consequently, producing usable interfaces

# Design: an iterative process







# How to become a good designer?

- Learn the psychology and physiology of humans.
- Learn different perspectives of design.
- Learn guidelines to avoid flaws in design.
- Watch talks about design!
  - E.g.: <http://talks.ui-patterns.com/topics/design>  
[supplementary]



# How to become a good designer?

- Try lots of apps recommended for their design to get inspiration.
- Imitate first, then innovate.
- Evaluate your designs objectively and/or subjectively.
- Follow research in HCI
  - CHI: <http://www.sigchi.org/> [supplementary]
  - UIST: <http://uist.acm.org/archive/> [supplementary]



**How to judge if an interface is good?**

# Usability

Usability is the extent to which a product can be used by **specified users** to achieve specified **goals** with **effectiveness, efficiency** and **satisfaction** in a **specified context** of use.

According to norm ISO 9241-110



# Usability Analysis in Action

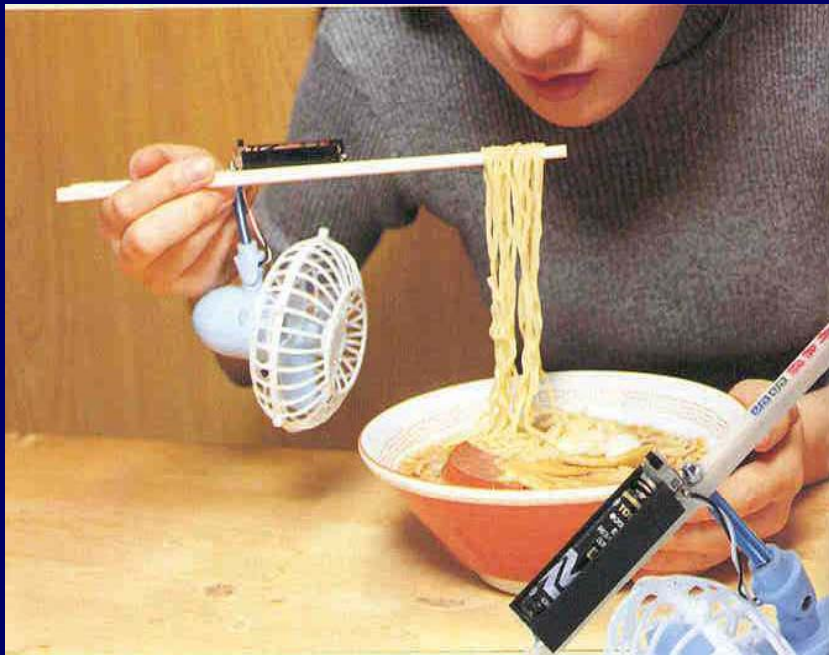




# Usability vs. Usefulness

- HCI has dual concerns
  - **Usefulness** — The extent to which a system's functionality meets the needs of users and supports their tasks
  - **Usability** — The degree to which an interface is easy to learn, is easy to use, protects against catastrophic errors, and provides user support

# Usability vs. Usefulness



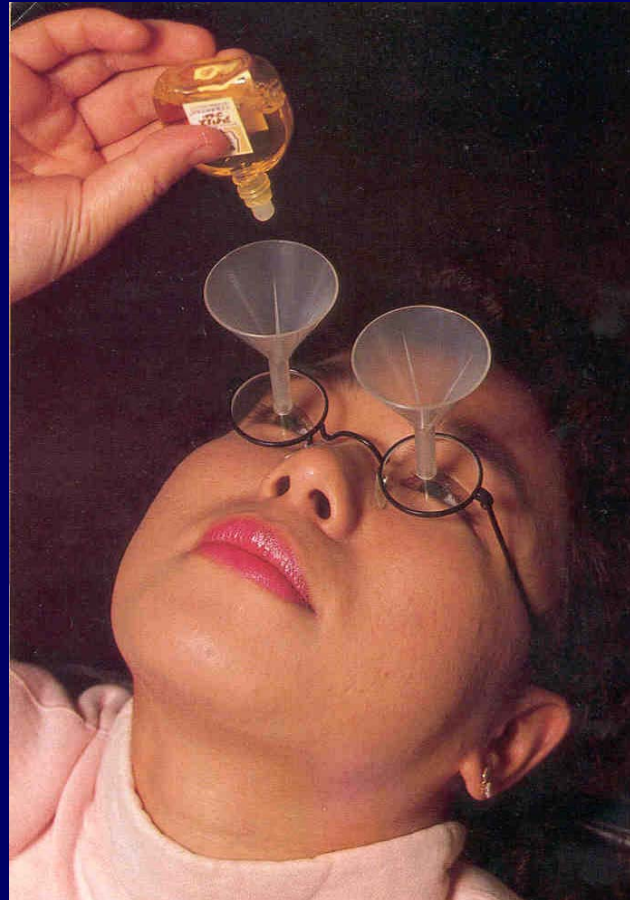
**Useful but not usable**



**Usable but not useful**



# Usability vs. Usefulness



**Neither useful nor usable**



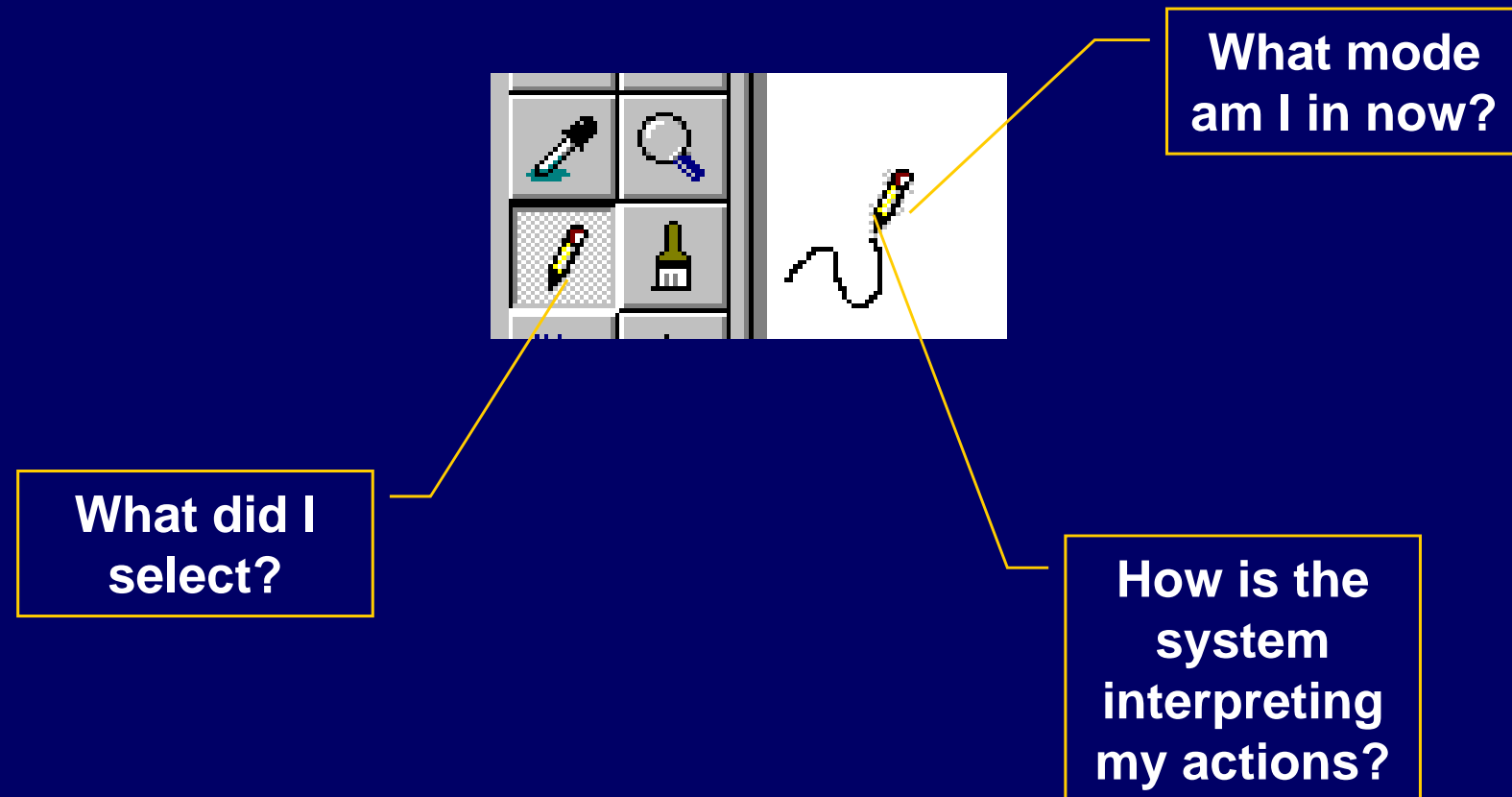


# Usability Heuristics

- What is it?
  - Technology-independent set of rules for design and decision-making based on prior experience
  
- When are they used ?
  - When designing a new system checking designs on compliance
  - For evaluation of existing systems on compliance with heuristics

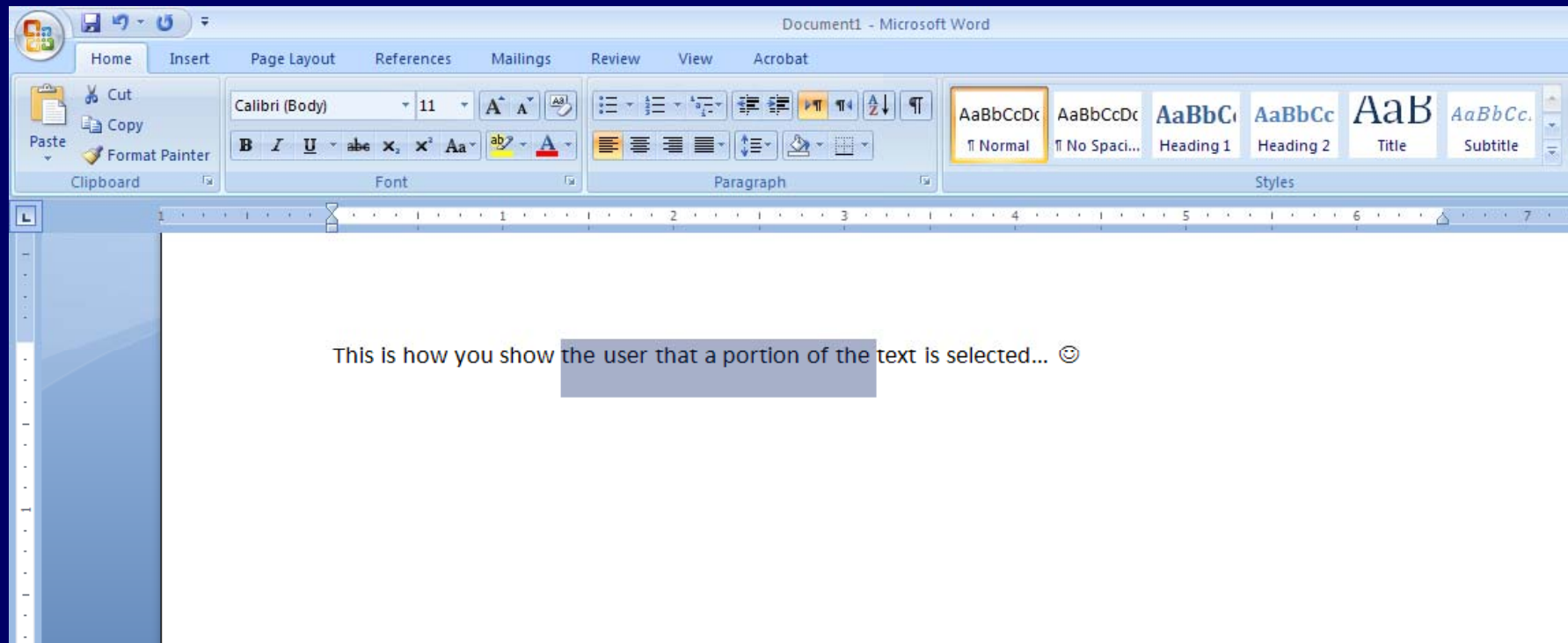
# Nielson's Heuristics

- H1: Visibility of system status
  - Keep users informed about what is going on



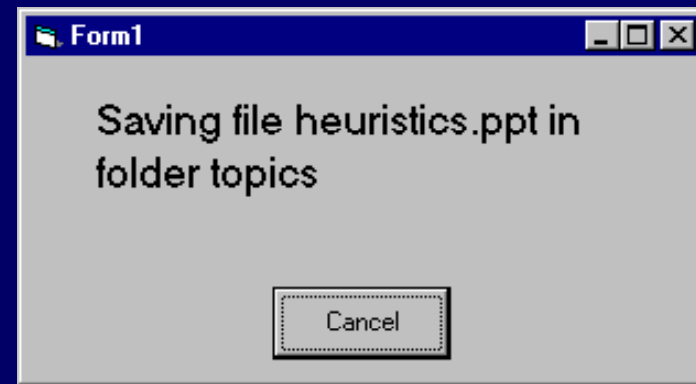
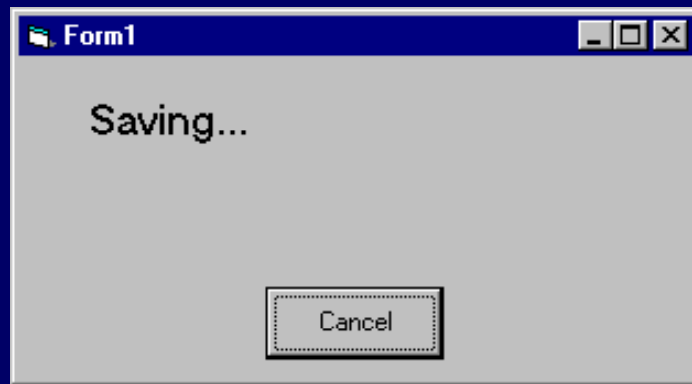
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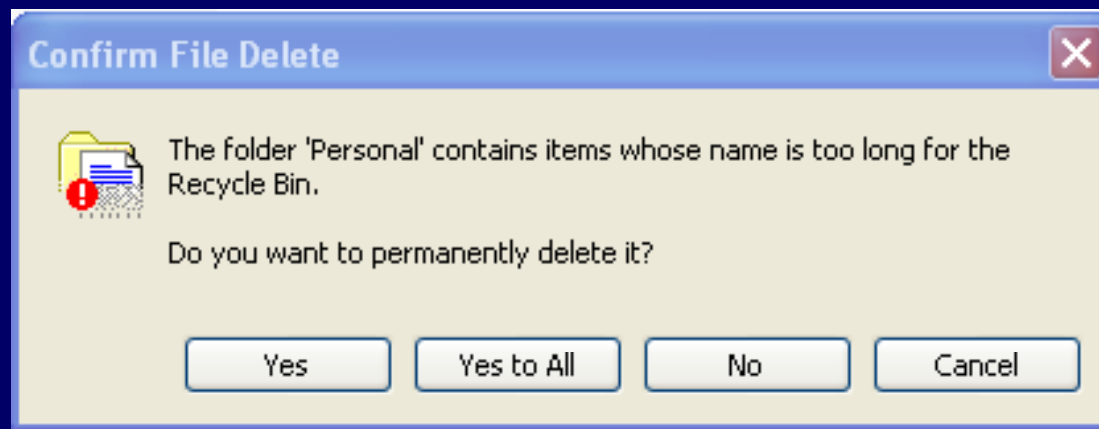
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- H1: Visibility of system status
  - Keep users informed about what is going on
  - Be as specific as possible



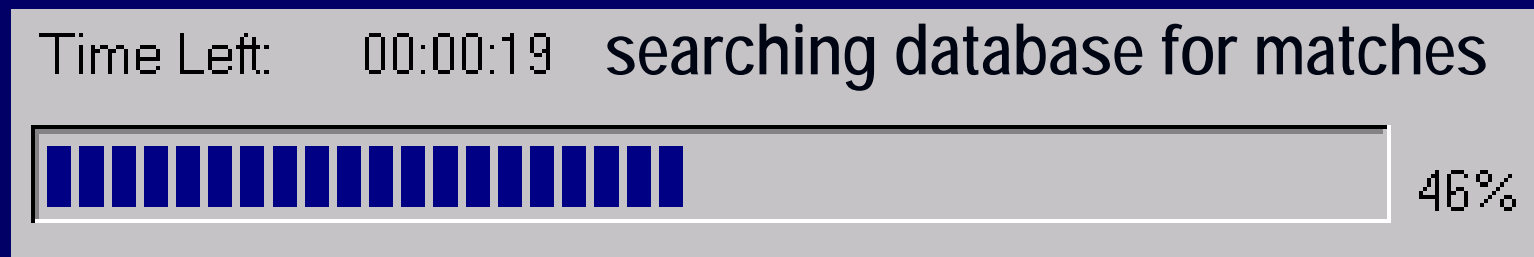
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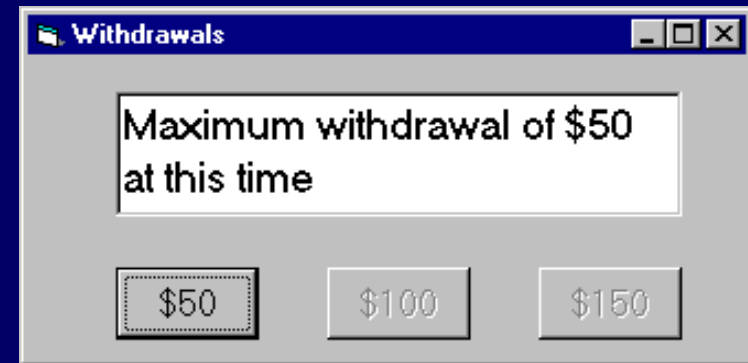
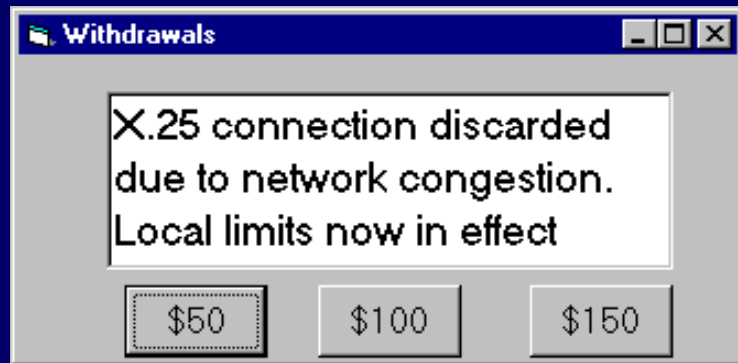
# Nielson's Heuristics

- H1: Visibility of system status
  - Keep users informed about what is going on
  - Be as specific as possible
  - Pay attention to response time
    - 0.1 sec: no special indicators needed, why?
    - 1.0 sec: user tends to lose track of data
    - 10 sec: max. duration if user to stay focused on action
    - for longer delays, use percent-done progress bars



# Nielson's Heuristics

- H2: Match between system and the real world
  - Speak the users' language
- E.g.



# Nielson's Heuristics

- H2: Match between system and the real world
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- E.g.

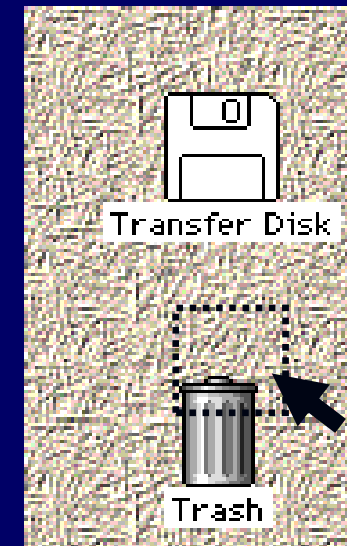




# Nielson's Heuristics

- H2: Match between system and the real world
  - Speak the users' language
  - Follow real world conventions

- E.g.



# Nielson's Heuristics


- H3: User control and freedom
  - Rule: Users should not be trapped by the interface!
  - How?
    - Trapped *in Action*
    - Trapped *after Action*
    - Trapped *during Execution*



Home Button

# Nielson's Heuristics

- H4: Consistency and Standards
  - Internal consistency
    - Principle of Least Surprise



The image shows a web form with a light gray background and a dark gray border. The form is divided into two main sections: 'Subscriber' and 'Contact'. The 'Subscriber' section contains two input fields: 'Name:' and 'Account #:', each followed by a text box. To the right of these fields are labels 'Tech. Re' and 'Status:'. The 'Contact' section contains two input fields: 'Telephone:' and 'Address:', each followed by a text box. To the right of these fields are labels 'E-Mail:' and 'St'. At the bottom of the form are two buttons: 'Save' and 'Cancel'.

**Subscriber**

Name:  Tech. Re

Account #:  Status:

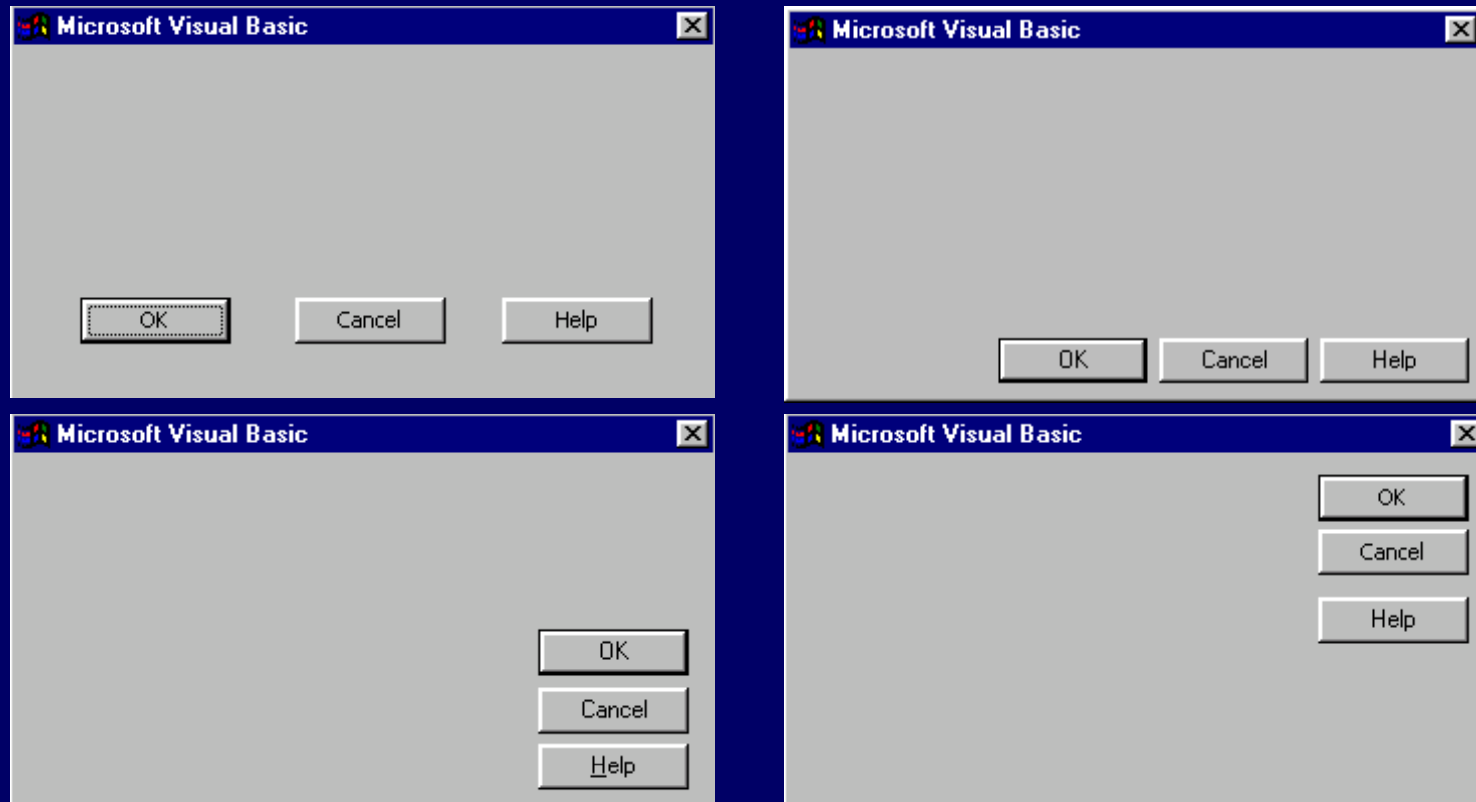
**Contact**

Telephone:  E-Mail:

Address:  St

# Nielson's Heuristics

- H4: Consistency and Standards
  - External consistency: follow platform standards



# Nielson's Heuristics

- H4: Consistency and Standards
  - Metaphorical consistency
  - What is a metaphor ?
    - A type of analogy
    - One way to make an interface intuitive

```

root@asoka:/# ls -l
total 128
drwxr-xr-x 16 root root 8192 Jan 26 17:06 ./
drwxr-xr-x 16 root root 8192 Jan 26 17:06 ../
drwx----- 3 root sys  96 Oct 28 14:23 .secure/
-rw----- 1 root sys 4012 Feb  4 16:22 .sh_history
lr-xr-xr-x  1 bin  bin   8 Mar 10 2009 bin -> /usr/bin/
drwxr-xr-x  2 root sys  96 Mar 10 2009 /dev/
dr-xr-xr-x 21 bin  bin  8192 Jan 26 17:07 dev/
dr-xr-xr-x 38 bin  bin  8192 Feb  4 12:00 etc/
drwxr-xr-x  8 root root 8192 Oct  6 10:59 home/
lr-xr-xr-x  1 bin  bin   8 Mar 10 2009 lib -> /usr/lib/
drwxr-xr-x  2 root root  96 Mar 10 2009 lost+found/
dr-xr-xr-x  1 root root  1 Jan 26 17:06 net/
-rw-rw-rw-  1 root root 8413 May 12 2009 null
dr-xr-xr-x 85 bin  bin  8192 Nov 12 12:25 opt/
drwx----- 8 root root 8192 Feb  4 11:02 root/
dr-xr-xr-x 16 bin  bin  8192 Jan 18 10:20 sbin/
dr-xr-xr-x  9 bin  bin  8192 Jan 26 17:06 stand/
drwxr-xr-x 10 root root 8192 Feb  4 12:09 /
dr-xr-xr-x 22 bin  bin  8192 Mar 10 2009 usr/
dr-xr-xr-x 27 bin  bin  8192 Mar 10 2009 var/
root@asoka:/# df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/vg00/lvol3 1.5G 315M 1.2G 22% /
/dev/vg00/lvol1 1.8G 346M 1.5G 20% /stand
/dev/vg00/lvol8 20G  6.5G 14G 33% /var
/dev/vgignite/lv_archives 339G 289G 48G 86% /var/opt/ignite/recovery/archives
/dev/vg00/lv_crash 9.8G 20M 9.2G 1% /var/adm/crash
/dev/vg00/lvol7 5.0G 3.1G 2.0G 62% /usr
/dev/vg00/lvol6 1.0G 111M 900M 11% /tmp
/dev/vg00/lvol5 28G  5.5G 15G 20% /opt
/dev/vg00/lvol4 128M 7.5M 121M 6% /home
DevFS           6.0K 6.0K  0 100% /dev/deviceFileSystem
root@asoka:/# alias ls && alias df
alias ls="ls -la"
alias df="df -h"
root@asoka:/#

```



[http://en.wikipedia.org/wiki/Xerox\\_Alto](http://en.wikipedia.org/wiki/Xerox_Alto)

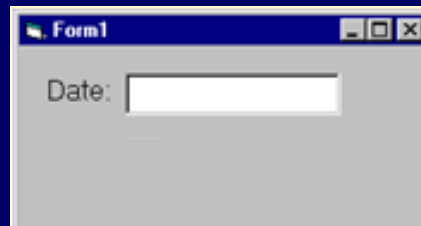
# Nielson's Heuristics

- H4: Consistency and Standards
  - Metaphorical consistency



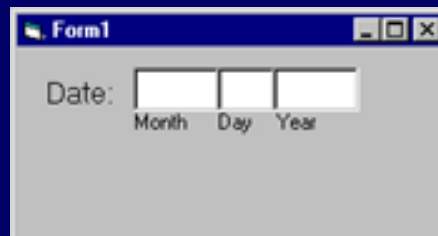
# Nielson's Heuristics

- H5: Error Prevention
  - Rule: selection is less error-prone than typing



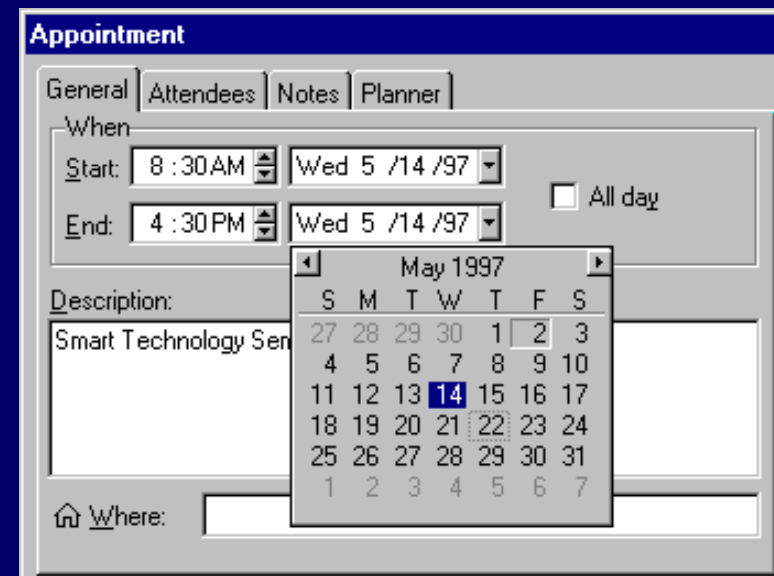
Form1

Date:



Form1

Date:     
Month Day Year



Appointment

General Attendees Notes Planner

When

Start: 8:30AM Wed 5 /14 /97

End: 4:30PM Wed 5 /14 /97

☐ All day

Description:

Smart Technology Ser

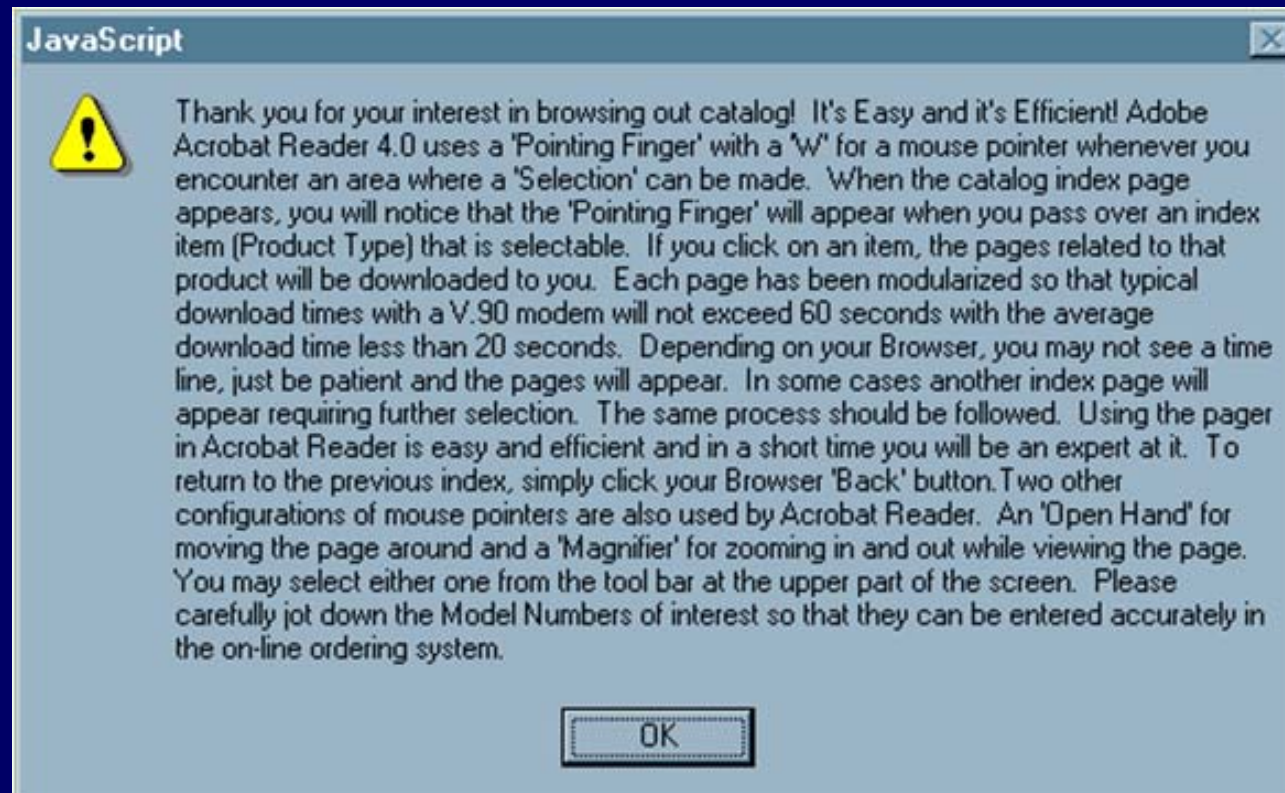
Where:

May 1997

S	M	T	W	T	F	S
27	28	29	30	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7

# Nielson's Heuristics

- H6: Minimize user's memory load
  - Rule: 7 +/- 2 "chunks"





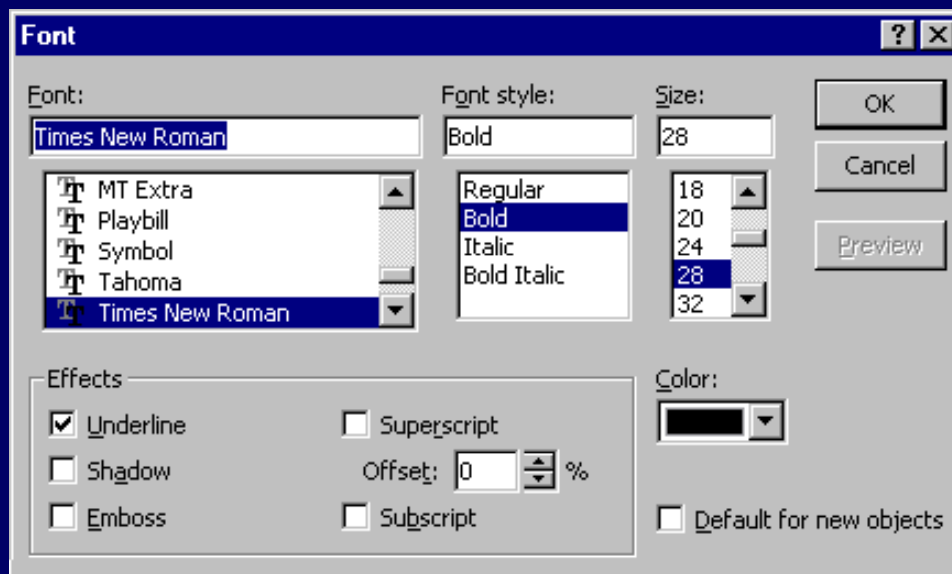


# Nielson's Heuristics

- H6: Minimize user's memory load
  - Rule: recognition is better than recall
    - Recall: info reproduced from memory
    - Recognition: presentation of info provides knowledge that info has been seen before easier because of cues to retrieval

# Nielson's Heuristics

- H6: Minimize user's memory load
  - Rule: recognition is better than recall



free recall



cued recall (recognition)



# Nielson's Heuristics

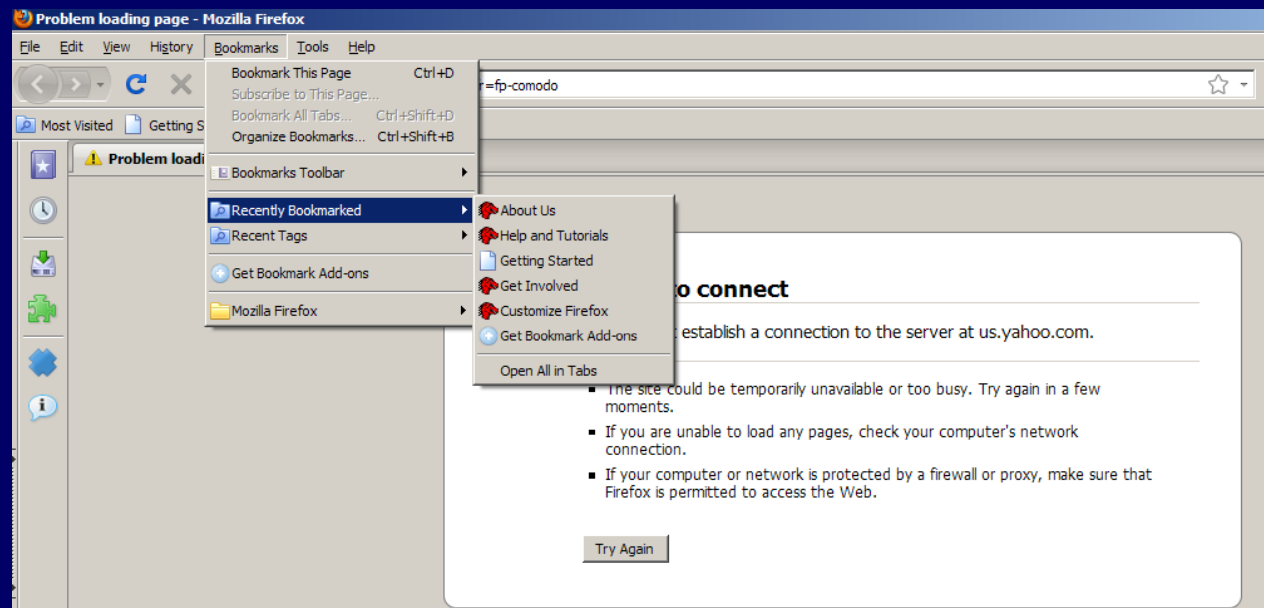
- H6: Minimize user's memory load

**Which feature exists in Browsers that encourage recognition rather than recall?**

# Nielson's Heuristics

- H6: Minimize user's memory load

**Which feature exists in Browsers that encourage recognition rather than recall?**





## References

- **Supplementary:**

- <https://www.youtube.com/watch?v=RIQEoJaLQRA>
- <https://www.youtube.com/watch?v=flRuSn0df8Q>
- [https://www.youtube.com/watch?v=NcdrfacG\\_y4](https://www.youtube.com/watch?v=NcdrfacG_y4)