User Interface Design

Lecture 1

Introduction

Interface Hall of Shame

Course Objectives

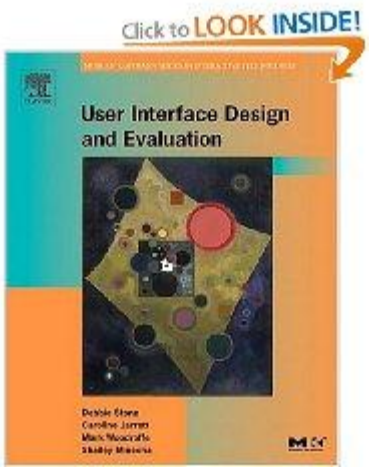
- To design and evaluate UIs
- Use user-centered, iterative design
- Select appropriate interface components

Course Evaluation

- Assignments 25%
- Midterm Examination 20%
- Final Examination 25%
- Project 30%

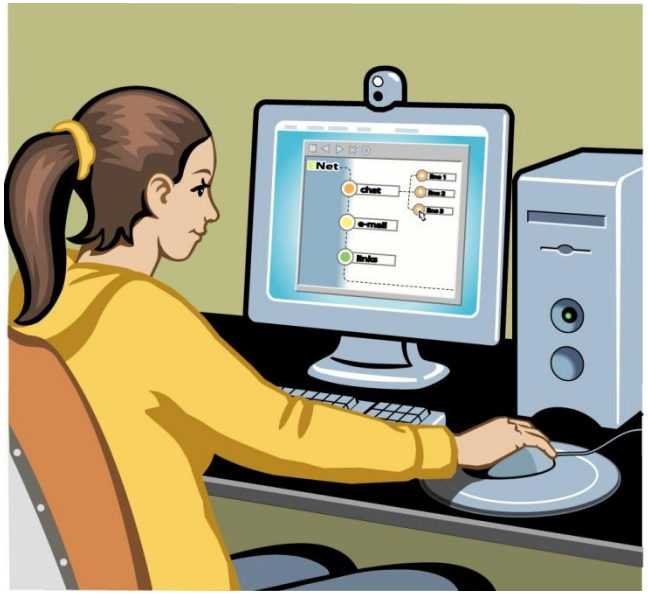
Textbook

- Debbie Stone, Caroline Jarrett, Mark Woodroffe, and Shailey Minocha, *User Interface Design and Evaluation,* Elsevier, 2005.

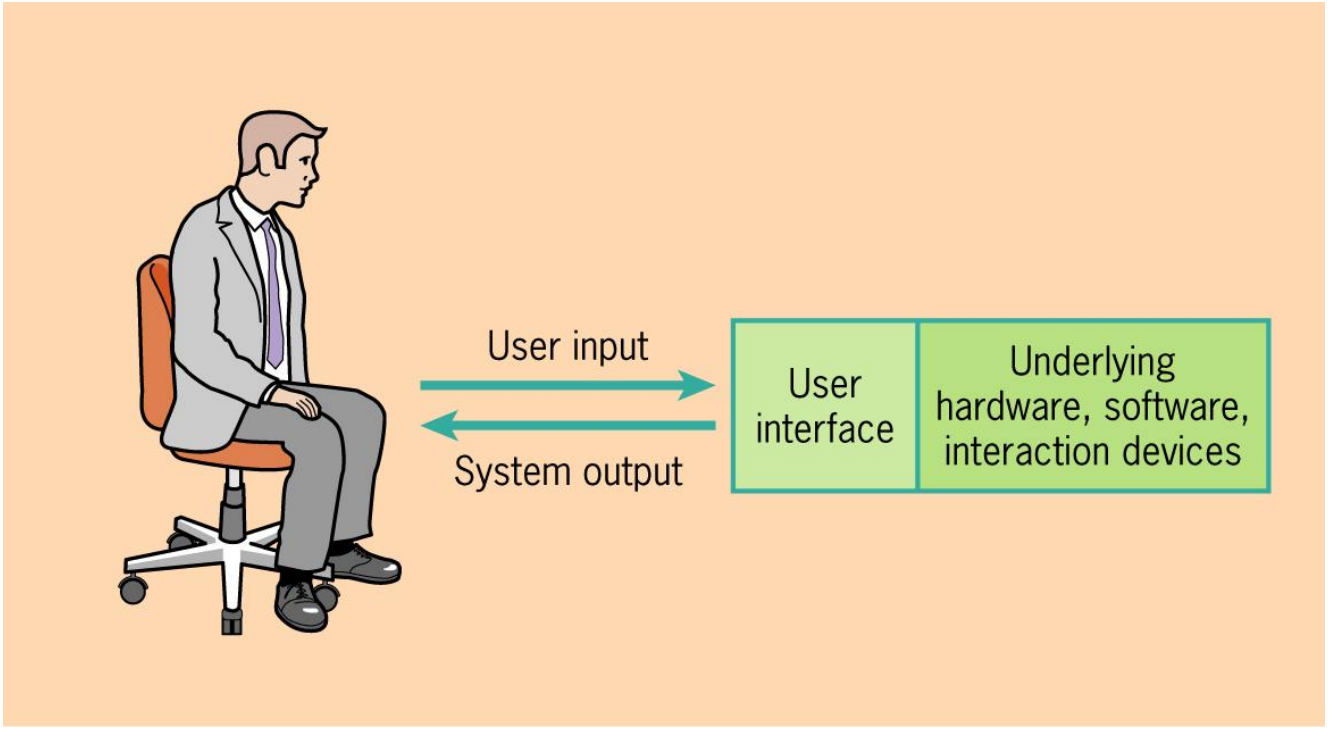


Why UI?

- HCI – many disciplines involved, cs., psychology, ergonomics, engineering, graphic design, etc.
- We want to design good UI – easy to use and easy to understand

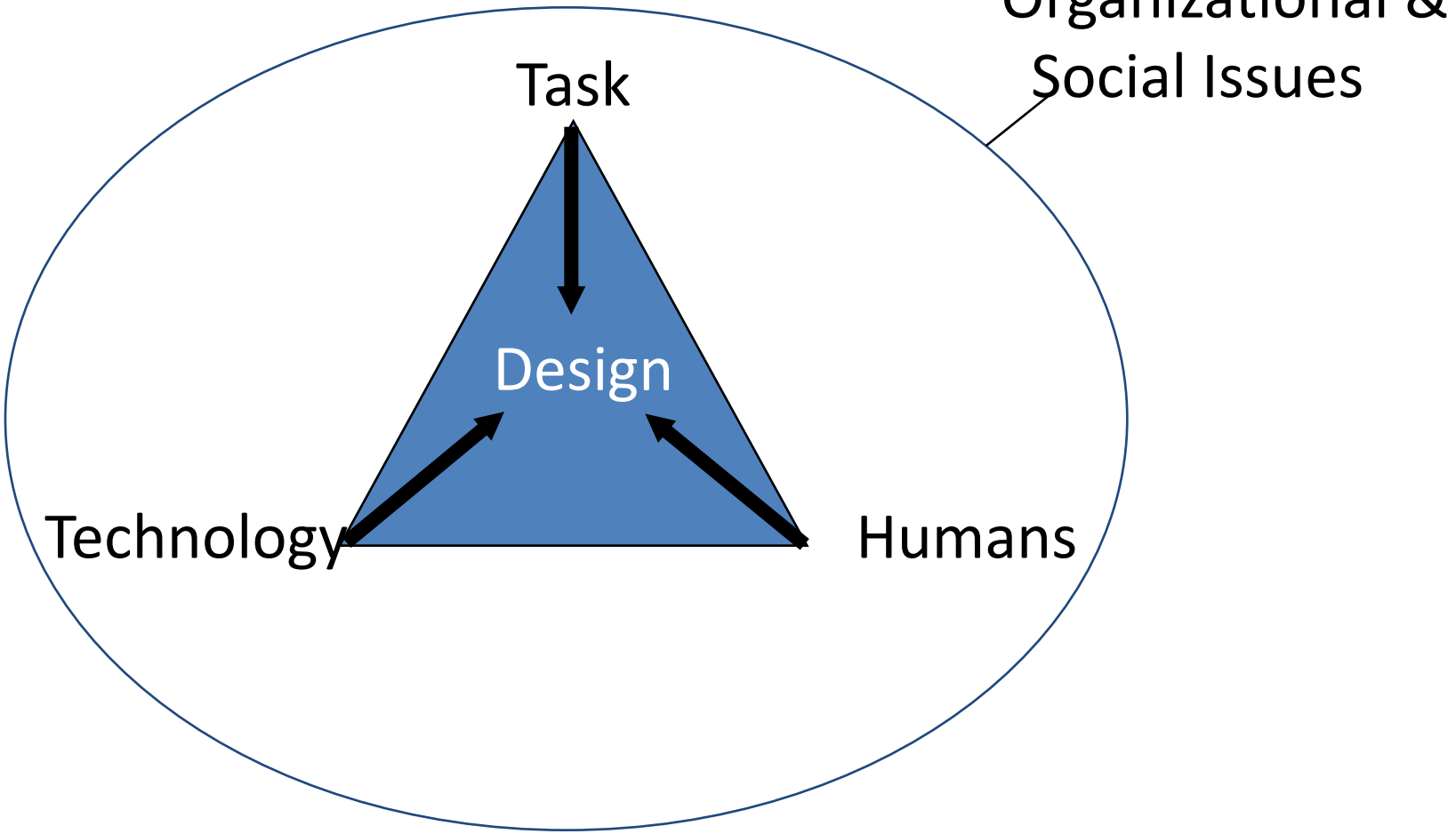


What is UI?


User input
System output
User interface
Underlying hardware, software, interaction devices

Computer are Ubiquitous

What to Design?

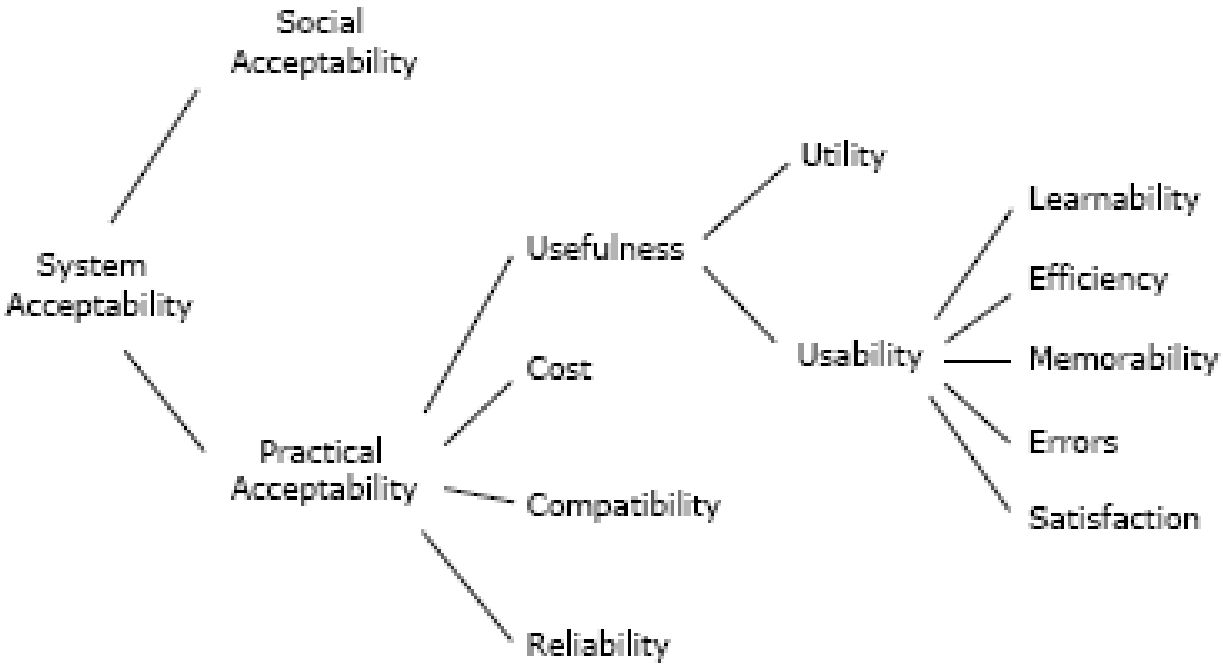


The Importance of Good User Interface Design

- What is a good user interface design?
  - Encourage easy, natural, and engaging interaction between a user and a system
  - Focus on usability

Goal of User Interface Desing

- Usability (from *Usability Engineering*, Jacob Nielsen)



What is Usability?

Usability (ISO 9241): "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."

Effectiveness: "the accuracy and completeness with which users can achieve goals in particular environments"

Efficiency: "the resources expended in relation to the accuracy and completeness of the goals achieved"

Satisfaction: "the comfort and acceptability of the work system to its users and other people affected by its use"

Usability by Jacob Nielsen

- Learnability
  - ease of learning for novice users
- Efficiency
  - steady state performance of expert users
- Memorability
  - ease of using system intermittenly for casual users
- Errors
  - low error rate
- Subject Satisfaction
  - how pleasant system is to use

Usability Considerations

- Who are the users, what do they know, and what can they learn?
- What do users want or need to do?
- What is the general background of the users?
- What is the context in which the user is working?
- What has to be left to the machine? What to the user?

Other considerations

- Can users easily accomplish their intended tasks?
- How much training do users need?
- Documentation and support.
- Errors
- Error recovery

Usability problems

- Defect types
  - Program error (bug)
  - Missing functionality
  - Ease-of-use problem

Measurements

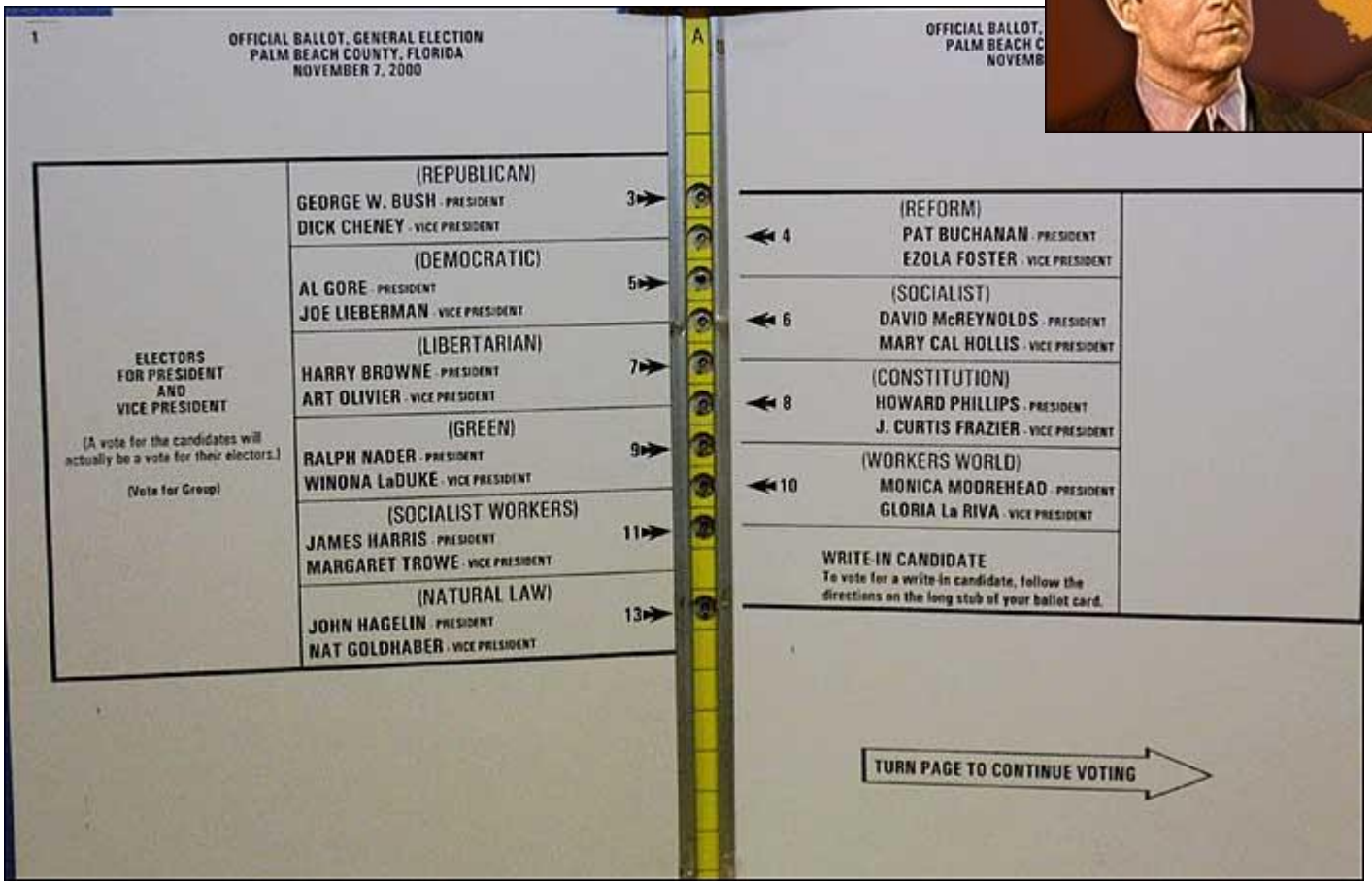
- Task time
- Problem counts
- Keystroke counts
- Opinion polls
- Etc.

"There is little correlation between subjective satisfaction and objective performance. "

The Problems of Poor or Bad User Interfaces

- User frustration and dissatisfaction

The Problems of Poor or Bad User Interfaces

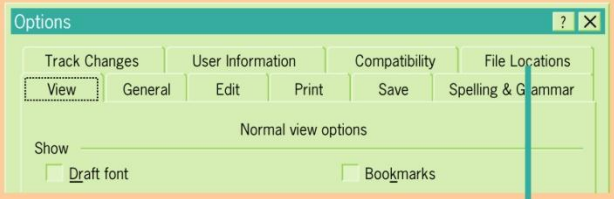


The Problems of Poor or Bad User Interfaces

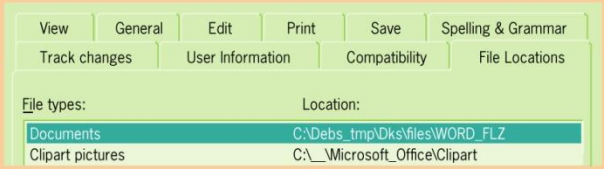
- Loss of productivity, Efficiency, and Money
- Safety
  - Wrong light valve indicator
  - Obscured by another valve

The Problems of Poor or Bad User Interfaces

The "Options" dialogue box from the "Tools" menu in Word 97



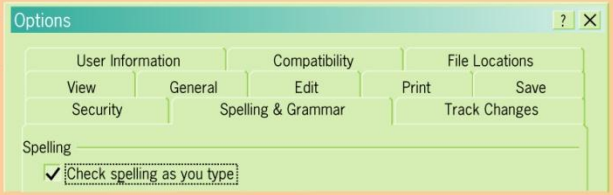
Choosing the "File Locations" tab only makes the two rows of tabs swap positions. The ordering of the tabs from left to right does not change.



The "Options" dialogue box from the "Tools' menu in Word 2002

Choosing the "Spelling & Grammar" tab makes the three rows of tabs rotate their positions. When this is done in real time the tabs seem to scramble, and it is hard to see that the ordering of the tabs from left to right does not actually change.

Thus it is far easier to see and follow the movement of the tabs in Word '97 than in Word 2002, the more current version.



Designing for Users

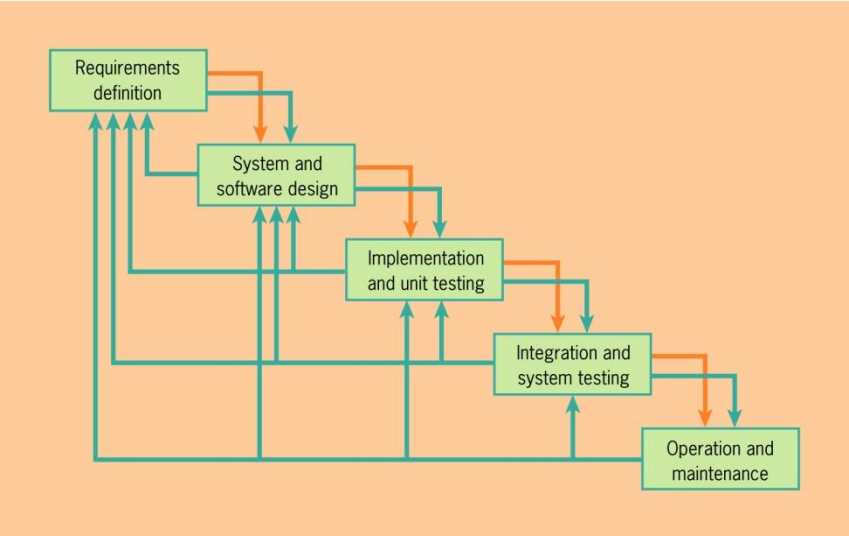
- User-Centered Design Principles
  - Active involvement of users
  - Allocation of function between user and system
  - Iteration of design solutions
  - Multidisciplinary design teams

Designing for Users

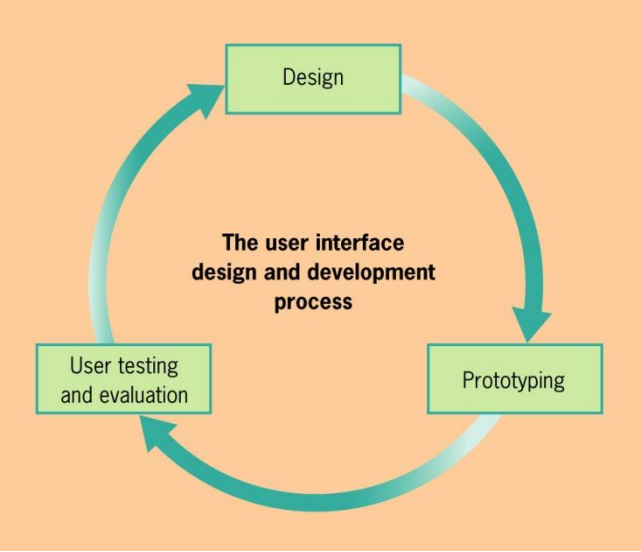
- User-Centered Design Activities
  - Understand and specify the context of use
  - Specify the user and organizational requirements
  - Produce design solutions (prototypes)
  - Evaluate designs with users against requirements

Designing for user

Classic life cycle



Iterative design



Designing for Users

- Involving Users
  - Who are the users?
    - Customers
    - Other people within the users' organizations
    - Users or end users (*)
  - Stakeholders
    - Payers, administration, developers, end-users
  - Users
    - Users of the computer system

Knowledge Needed for UI Design

- Information-gathering and analyses that form part of the user interface design and development process
- User interface design knowledge (i.e. design principles, design rules)

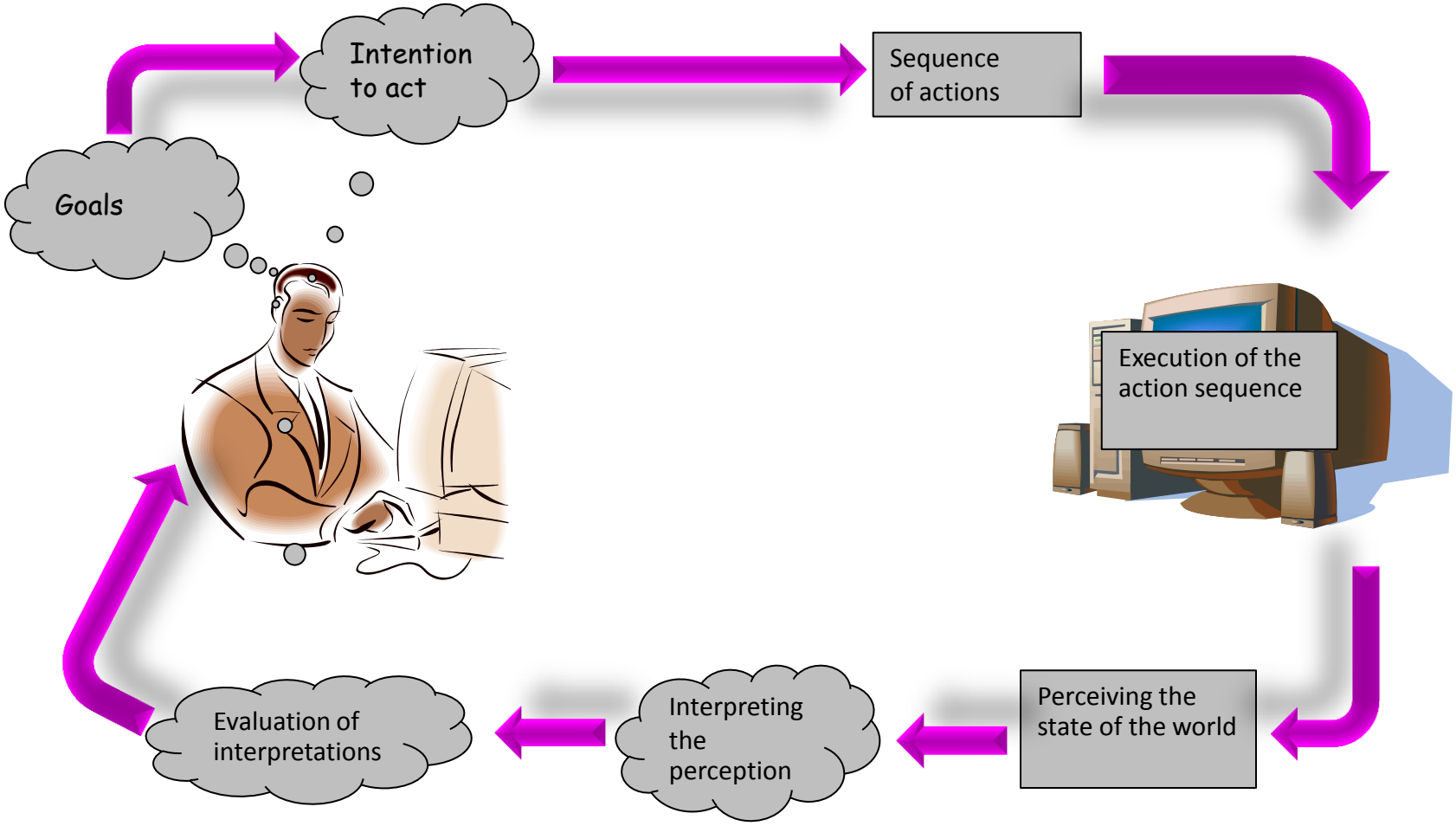
Evaluation

- When and How?
  - Early in the life cycle
    - Validate the users' requirement
    - Predict the usability
    - How well the UI meets users' need
  - Later in the life cycle
    - How well the UI meets users' need

How to Evaluate?

- Observing
- Interviewing, talking, and asking questions
- Making prediction
- Testing

Human Activity Cycle



Assignment # 1

- Think about your use of the different software applications that you use (e.g., office, browser). Choose one application, and think about a particular feature that you find confusing when you use it. And also, explain the reason that cause confusing.

- Due next week before class.