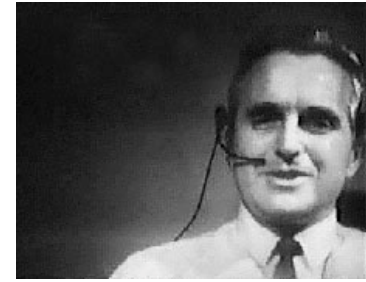# Lecture 16
Chapter 1+2 (Heim) contd.

Interaction Paradigms and Frameworks continued

Innovation - Douglas Engelbart (Turing Award 1997)

- oNLine System (NLS) 1968
  - The Mother of All Demos:
    http://sloan.stanford.edu/MouseSite/1968Demo.html

NLS Mouse and workstation

Ergonomic Keyboard Console

First Mouse

- How do Engelbart's innovations affect us today?

Courtesy Douglas Engelbart and Bootstrap Alliance.

Innovation - Ivan Sutherland (Turing Award 1988)

- The Ultimate Display – Ivan Sutherland

The ultimate display would, of course, be a room within which the computer can control the existence of matter. A chair displayed in such a room would be good enough to sit in. Handcuffs displayed in such a room would be confining, and a bullet displayed in such a room would be fatal. With appropriate programming such a display could literally be the Wonderland into which Alice walked. (*Sutherland, 1965, 508*)

The Ultimate Display

Sketchpad, 1963:
Light pen,
Constraint-based drawing

Alan Turing

- Turing Machines, 1936.
- Turing, A.M. (1950). "Computing machinery and intelligence". Mind, 59, 433-460:

Association for Computing Machinery
Advancing Computing as a Science & Profession

A. M. Turing Award

ACM's most prestigious technical award is accompanied by a prize of $100,000. It is given to an individual selected for contributions of a technical nature made to the computing community. The contributions should be of lasting and major technical importance to the computer field.

The Turing Test

Turing, A.M. (1950). "Computing machinery and intelligence". Mind, 59, 433-460:

- ... the question, "Can machines think?" ... should begin with definitions of the meaning of the terms "machine" and "think." ....Instead of attempting such a definition I shall replace the question by another, which is closely related to it and is expressed in relatively unambiguous words.
- The new form of the problem can be described in terms of a game which we call the 'imitation game."... The object of the game for the interrogator is to determine which of the other two is the man and which is the woman. ....The ideal arrangement is to have a teleprinter communicating between the two rooms.

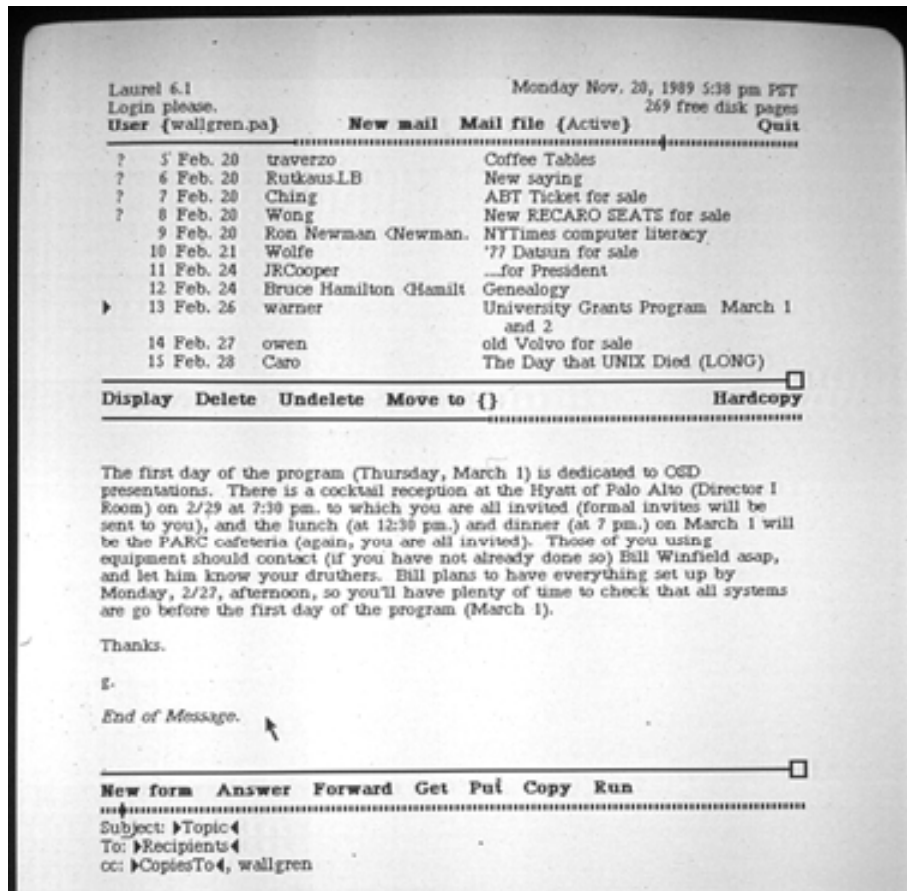Interaction style: instant messaging!

Interrogator
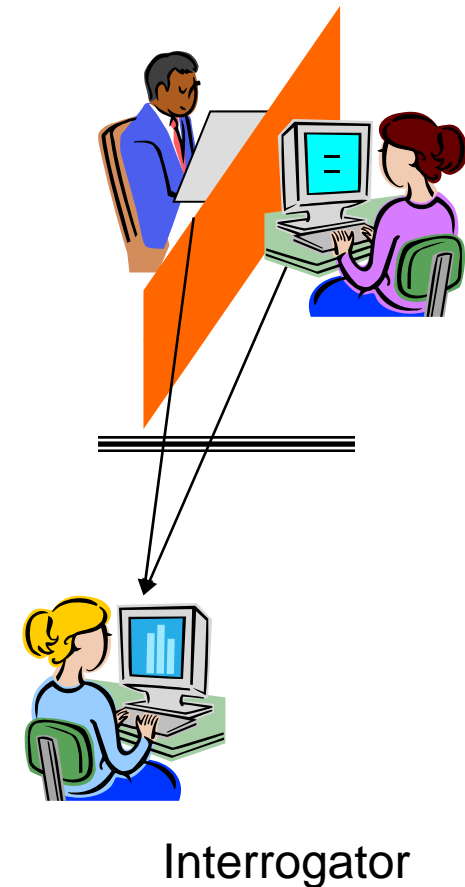
The Turing Test

- We now ask the question, "What will happen when a machine takes the part of A in this game?"

- Should make us think:

- Intelligent computer makes interaction easy, no need advanced interface technology.
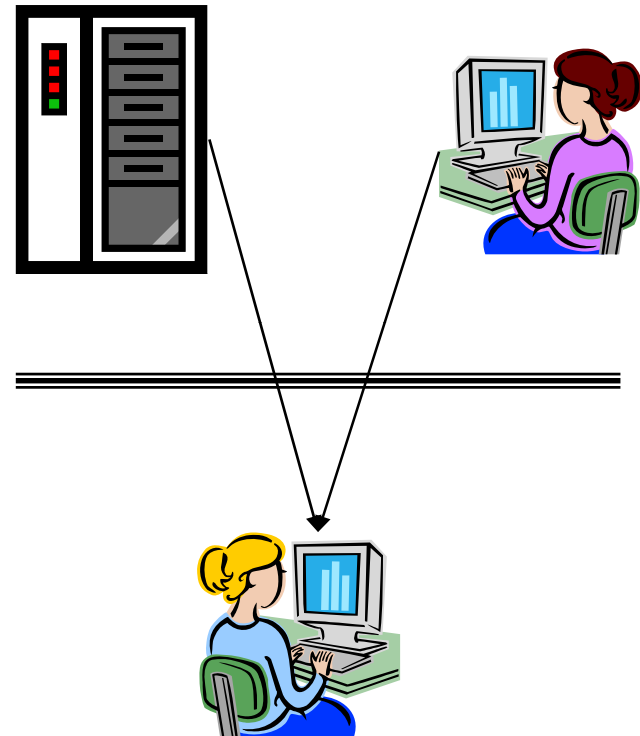
Personal Computing: Charles P. Thacker

[Turing award 2010]

The Xerox Alto mail program (1973)

The Xerox Alto computer (1973)

Courtesy Palo Alto Research Center.

Chap 1

Execution/Evaluation Action Cycle (EEC)

- Seven Stages of Action

Execution

Evaluation

Goals
What we want to happen

Forming intention
Specifying action
Executing action

Evaluating interpretation
Interpreting perception
Perceiving world state

WORLD

Gulf of Execution

- **User's formulation of actions
  ≠   actions allowed by the system**

- Does the interface allows us to carry out the actions required by the intention?

  Goal = save a file
  Intention = use the file menu
  Action = click the save option

- Is there a save option in the file menu?

Gulf of Evaluation

- **User's expectation of changed system state
  ≠   actual presentation of this state**

- Given a particular interface design, how easily can you:

  - Determine the function of the device?
  - Determine what actions are possible?
  - Determine mapping from intention to physical movement?
  - Perform the action?
  - Determine whether the system is in the desired state?
  - Determine the mapping from system state to interpretation?
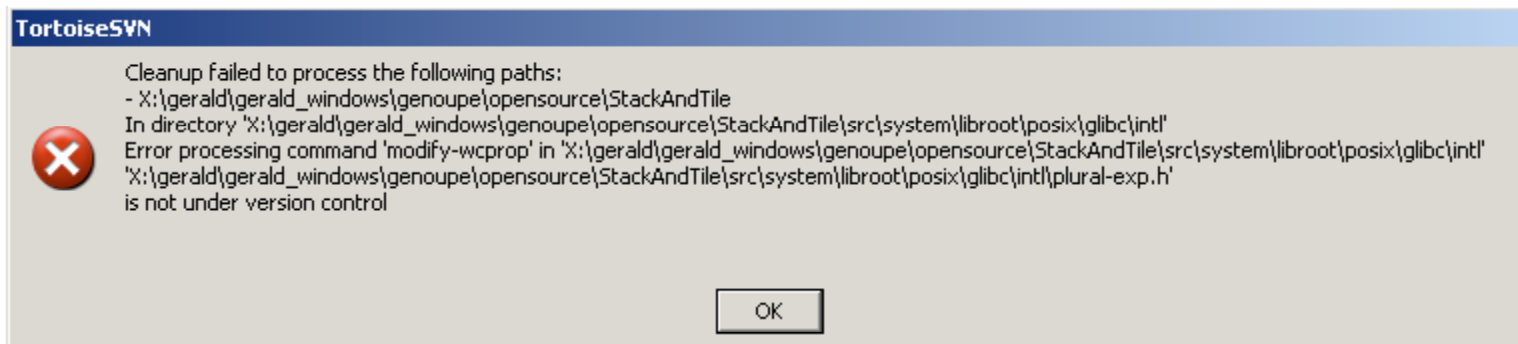 - Determine what state the system is in?

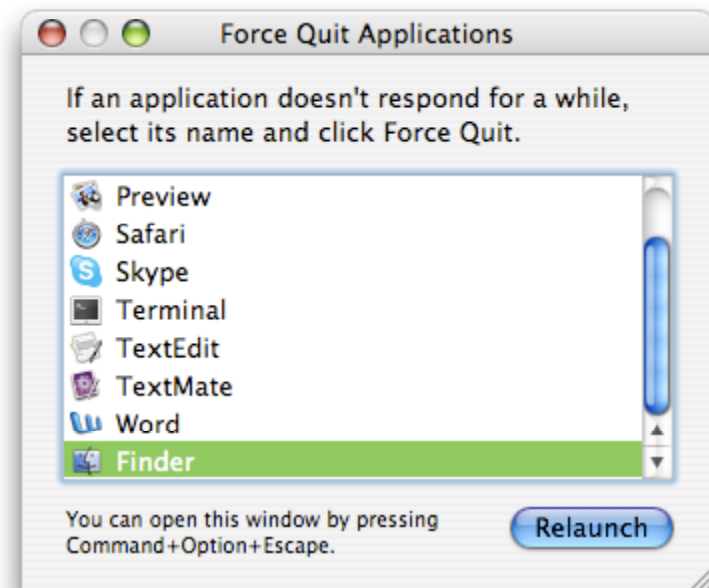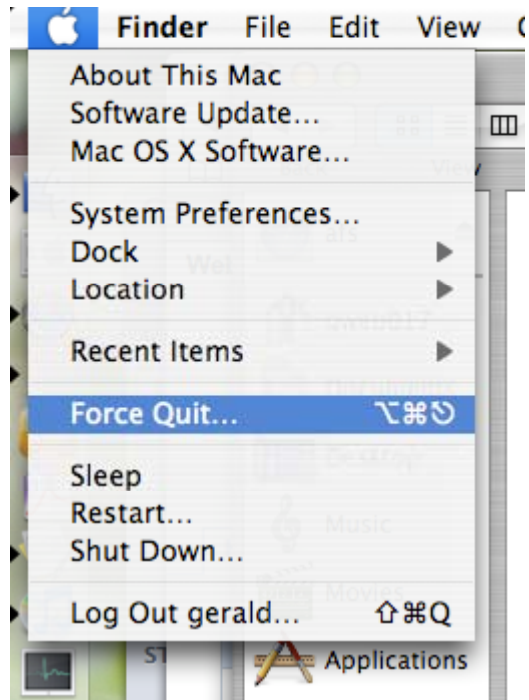(Norman, 1990)

Semantic and Articulatory Distance
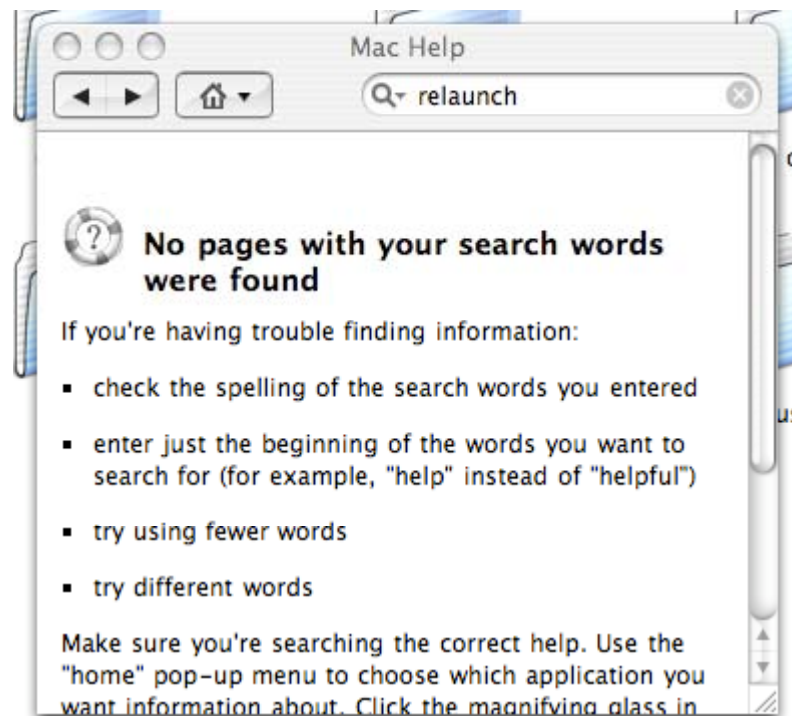
- **Semantic Distance**
  - The distance between what people want to do and the meaning of an interface element.

- **Articulatory Distance**
  - The distance between the physical appearance of an interface element and what it actually means.
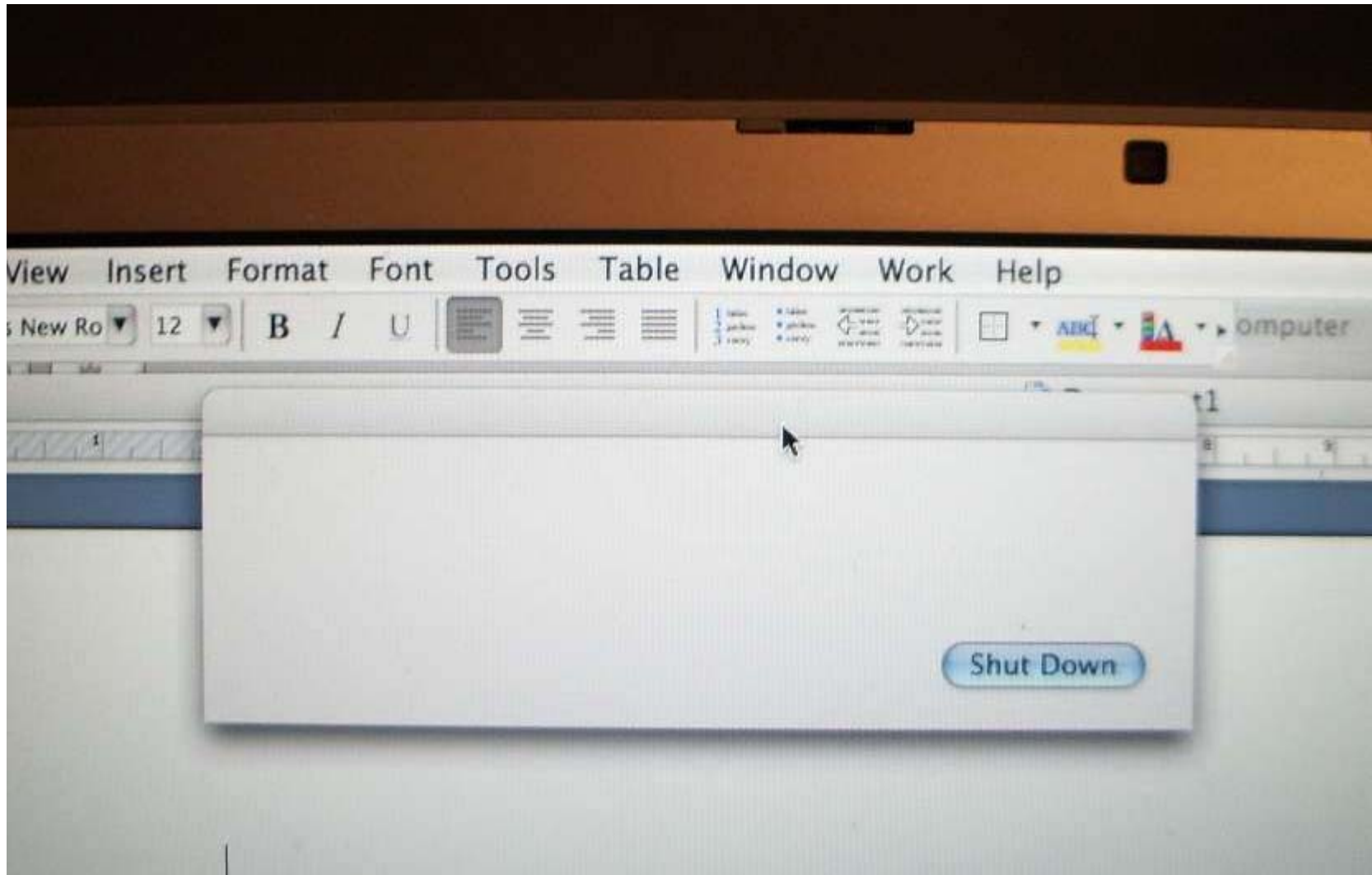
TortoiseSVN

Cleanup failed to process the following paths:
- X:\gerald\gerald_windows\genoupe\opensource\StackAndTile
In directory 'X:\gerald\gerald_windows\genoupe\opensource\StackAndTile\src\system\libroot\posix\glibc\intl'
Error processing command 'modify-wcprop' in 'X:\gerald\gerald_windows\genoupe\opensource\StackAndTile\src\system\libroot\posix\glibc\intl'
'X:\gerald\gerald_windows\genoupe\opensource\StackAndTile\src\system\libroot\posix\glibc\intl\plural-exp.h'
is not under version control

OK

⊞ 📁 RELATEDWORK

A&B Interaction Framework

- Abowd and Beale expanded on the EEAC to include the system

- **System (S)**—Uses its core language (computational attributes related to system state)

- **User (U)**—Uses its task language (psychological attributes related to user state)

- **Input (I)**—Uses its input language

- **Output (O)**—Uses its output language

Presentation **O** Observation

output

S **U**

core **I** task

Performance input Articulation
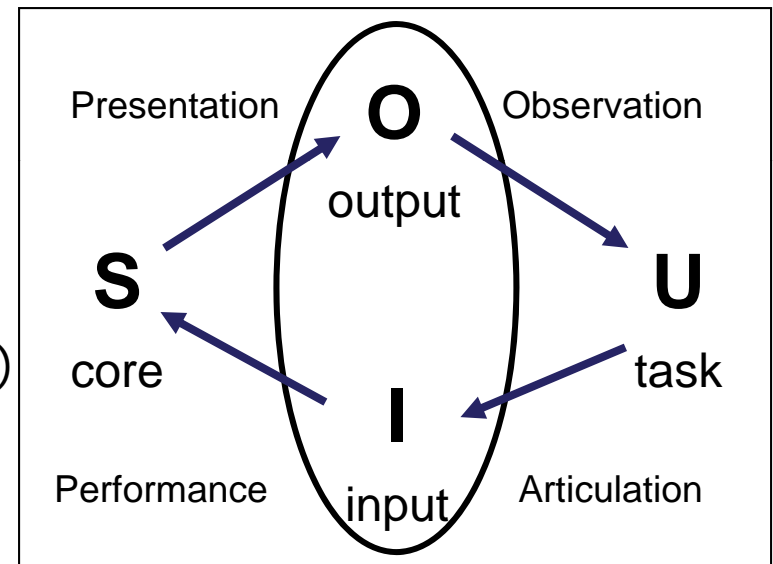
- each has its own unique language interaction $\Rightarrow$ translation between languages

- problems in interaction = problems in translation

A&B phases/translations

- **Execution Phase**
  - **Articulation**—The user formulates a goal, which is then articulated using the input language.
  - **Performance**—The input language is translated into the core language (operations that the system will carry out).
  - **Presentation**—The system manifests the result of the core-language operations using the output language.
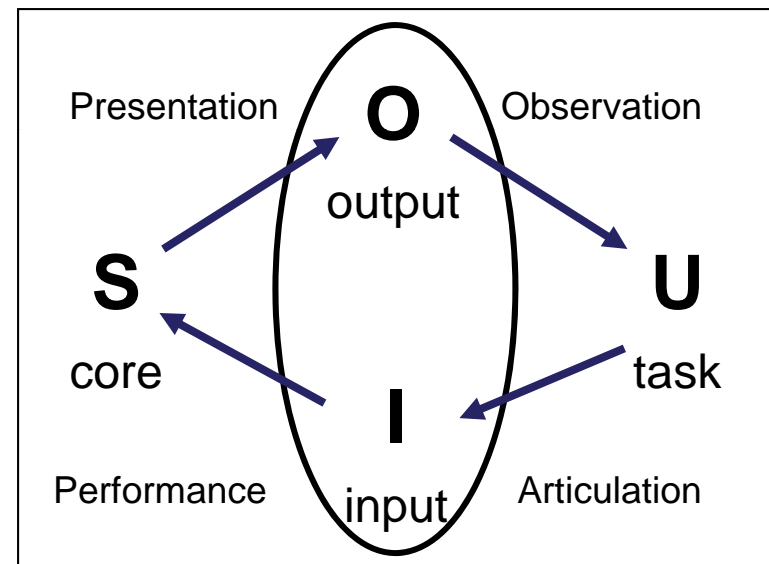- **Evaluation Phase**
  - **Observation**—The user interprets the results on the screen and reconciles them with the original goal.
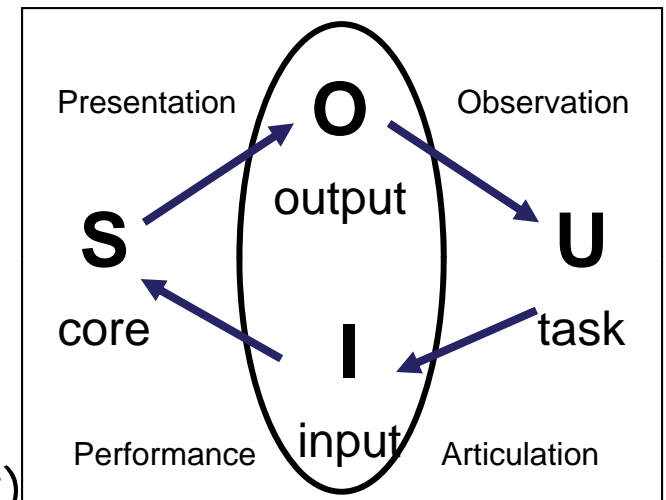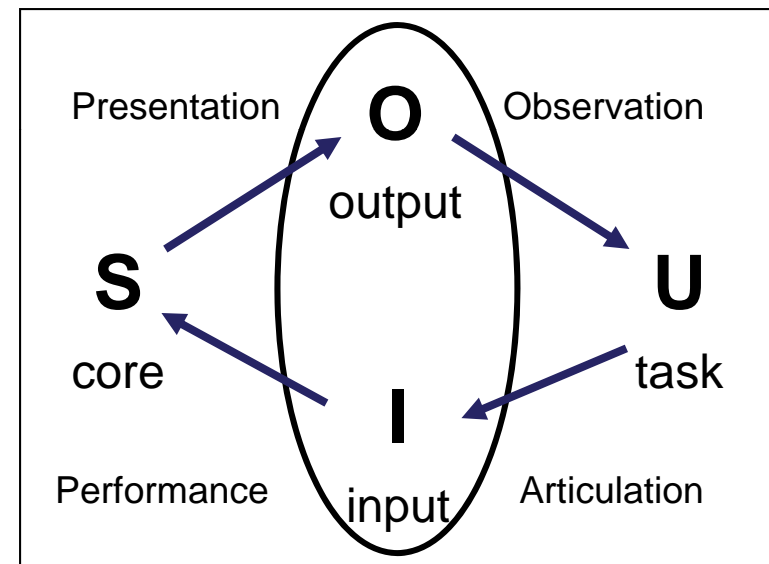
Application of A&B to Form-Oriented Analysis

- Proposals please

Applying A&B to FOA

- We have to identify the languages
- **User (U)—** requirements?
- **Input (I)—**Forms
- **Output (O)—**Pages
- **System (S)—** System state

Presentation — **O** — Observation
output
S — **U**
core — task
Performance — **I** — Articulation
input

Applying EEAC to FOA

• Proposals, please

Execution   Evaluation

Goals
What we want to happen

Forming intention   Evaluating interpretation
Specifying action   Interpreting perception
Executing action   Perceiving world state

- -

WORLD

Applying EEAC to FOA

Execution   Evaluation

Goals
What we want to happen

Choosing Form

Forming intention

Page interaction

Specifying action

Executing action

Page change
(submit)

Evaluating interpretation
Interpreting perception
Perceiving world state

WORLD

System state

- Coarse-grained conditional system response

places are available

list

new link

new page

delete link
- person

delete page

delete form
- person
- password

new form
- name
- phone
- studentID
- password
- password2

incorrect password

- *already registered*
- *password mismatch*