The seven stages of human action (Norman, 1988)

- **Goals**
  - Intention to act to achieve the goal
  - Evaluation of interpretations with respect to what we expected to happen

- **Sequence of actions**
  - That we plan to do
  - Interpreting the perception according to our expectations

- **Physical Execution of the sequence**
  - Perceiving the state of the world

- **Evaluation**: Comparing what happened with what we wanted to happen

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**Announcements**

- Next Week: Interface Presentations
  - Everyone must be ready on Tuesday 5/16/00
  - We'll start on Tuesday, and finish on Thursday.
  - 5% of Project 4 grade
- Reading Assignment for the following Tuesday 5/23/00
  - N&L 9.4 to 9.9 (but skip 9.4.3 and 9.4.4)
  - "Ten Steps for Conducting a User Observation" by Apple Computer, on course web page entitled "Interesting Links"

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**Topic for today**

- Cognitive Walkthrough

- Cognitive Walkthrough
  - Focuses on one attribute of usability: ease of learning
  - But other aspects of usability, like functionality and ease of use, are correlated with ease of learning
  - Will push your design in the direction of ease of use.
- Not ideal for highly trained users or efficiency-oriented interfaces.
  - Nuclear power plant operators
  - Air traffic controllers
  - Telephone operators
  - Assumes that users will not read the manual first
  - Relates to Norman's seven stages of human action

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**Two Phases of Cog. Walk.**

- Preparatory
  - Analysts agree on the input conditions and prepare the materials.
+ Analysis
- Analysts work through each action of every task being analyzed.

+ Preparation Phase
+ Who are the users of the system?
- The more precise the description, the better.
- Example: Users who already know how to prepare and print a simple document using Word 98.
+ What are the tasks?
- A reasonable representative collection of routine tasks.
- For existing system, perhaps just the known problem areas
- Should relate the the problem statement.
- Should be concrete and realistic.

+ Preparation Phase (continued)
+ What is the correct action sequence for each task?
- At the level of detail necessary to guide the user through the interface
- What would appear in a help system or manual
+ How is the interface defined?
- Describe the prompts preceding every user action
- Describe the interface's reaction to the actions
- The interface does not need to be implemented yet.

+ Question
- Is the cognitive walkthrough limited to interfaces you can see?

+ Analysis Phase
- Walk through the interaction telling a credible story.
+ At every step or prompt, consider:
  + Will the user know the correct subgoal or subtask?
- Example: Print or select printer first?
  + Will the user know that the correct action is available?
- Example: Any clues for how to print?
  + Will the user associate the correct action with the subgoal?
- Example: Type "lp" or find in menu?
  + If the correct action is performed, will the user know that progress is being made toward the goal?
- Example: Is it being printed?

+ Which interfaces succeed and which fail?
- To succeed, a credible story must be told for all four questions at every step of the way.
- If a credible story cannot be told for just one question at one step, you have identified an interface failure.

+ Analysis Phase
- Good idea to videotape it, to go back and verify or retrace comments or decisions
- As you go, record assumptions about what user would know prior to performing the task, and what the user would learn while performing the task.
- If you identify a problem, write it down, assume the correct action was made, and press on.

+ How to fix the breakdowns:
If the user does not know...
+ Which subgoal to accomplish
- Eliminate the required action
- Prompt the use to make the action
- Re-organize the interface to more closely support the users' anticipated task hierarchy
+ The action is available
- Make the controls more obvious, as with a prompt or a menu
+ The action is appropriate
  - Provide labels and descriptions for actions that incorporate the users’ vocabulary
  - Reword labels selected in error
+ Progress is being made
  - Prompt for the next correct action.
  - Provide feedback regarding what happened, ideally in the users’ vocabulary.

+ Let’s do a simple one
+ Preparation
  + Who are the users?
    - New user with data already loaded, or an experienced user who is not fully focused on this task.
  + What tasks will be analyzed?
    - Find Jeffrey Stolet’s phone number
    - Find Mark Timoney in New York’s work number
  + What is the correct action sequence for each task?
  + How is the interface defined?

+ Cognitive Walkthrough
  - A formalized methodology to check for gulfs of execution and evaluation
  - Focuses on ease-of-learning, but other aspects of usability are correlated with ease of learning
  - Does not assume highly trained users
  - Does not predict execution times

+ A lengthier discussion
  - Is available in Chapter 4 of the downloadable book: