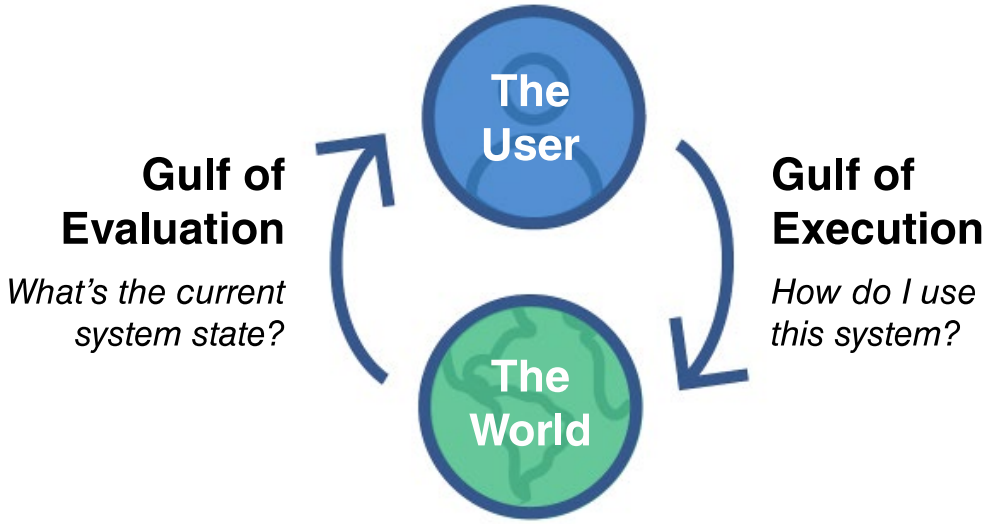
# Gulf of Execution
# Gulf of Evaluation

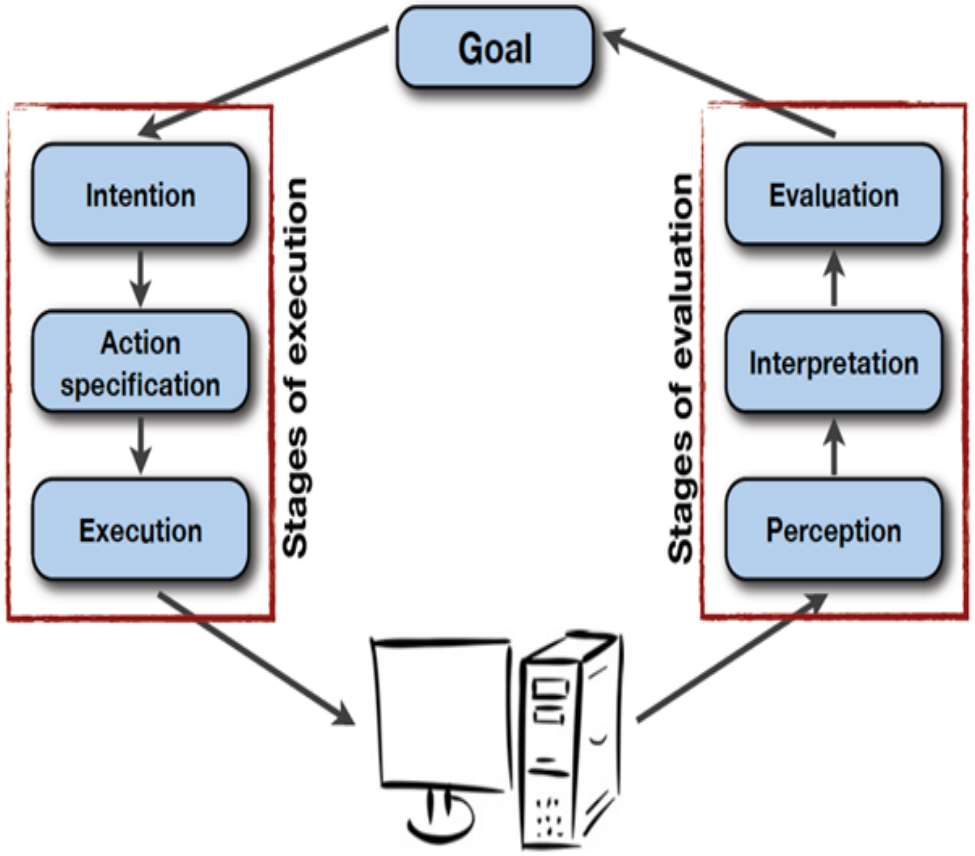
# Gulf of Execution and Evaluation

- The ‘gulfs’ explicate the gaps that exist between the user and the interface
- Gulf of execution - distance from the user to the physical system
- Gulf of evaluation - distance from the physical system to the user
- Bridging the gulfs can reduce cognitive effort required to perform tasks



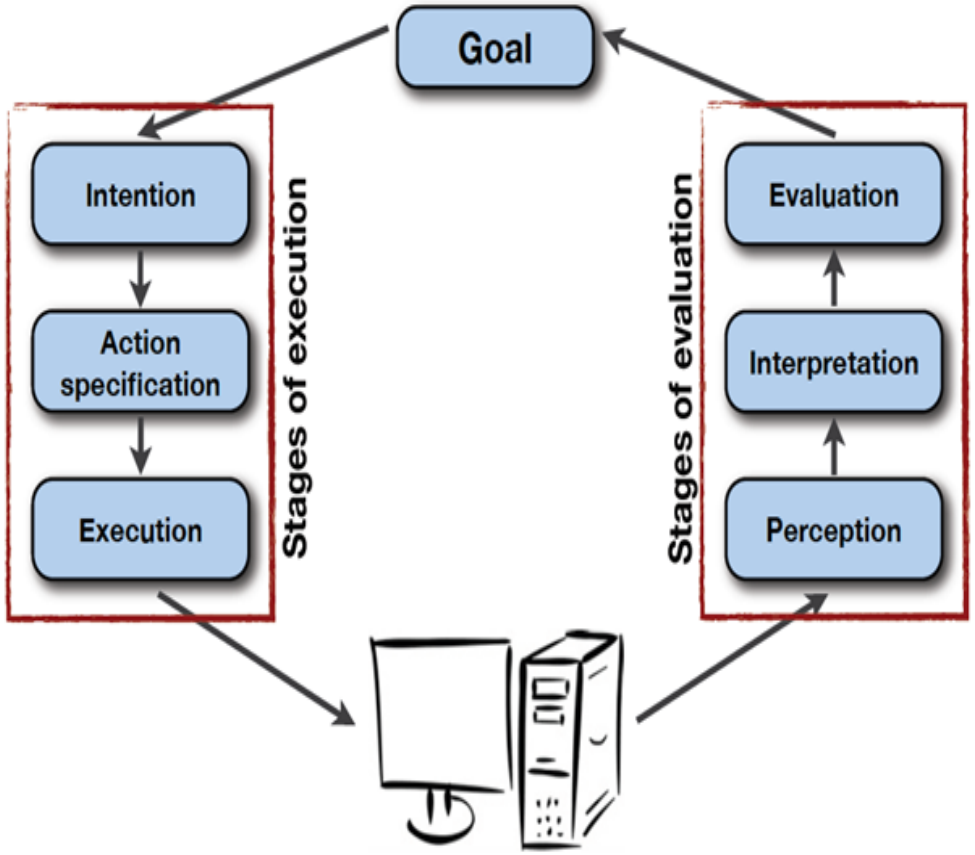
# Norman's Seven Stages of Action

- Model of how an individual completes an activity.
- All actions begin with a goal and these actions are repeated until the goal is achieved.
- Stages of action – actions to accomplish goal
- Stages of evaluation – evaluating the state of the system with respect to the goal.



# Stages of Execution

1. **Forming a goal** – What do I want to achieve?
2. **Forming the intention**: What would satisfy this goal?
3. **Specifying an action**: What do I want to do to achieve the intention?
4. **Executing the action**: Do the steps I have specified.

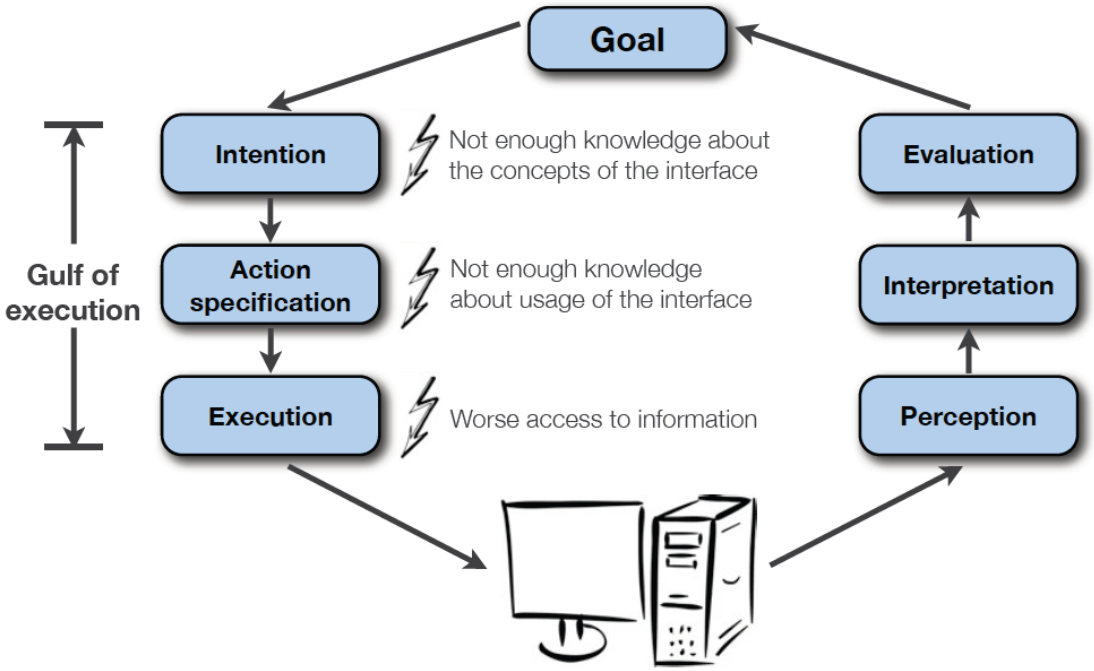


# Gulf of Execution

- Problems an individual has to translate his goals into actions.
- Difficulty in ‘using’ the interface.

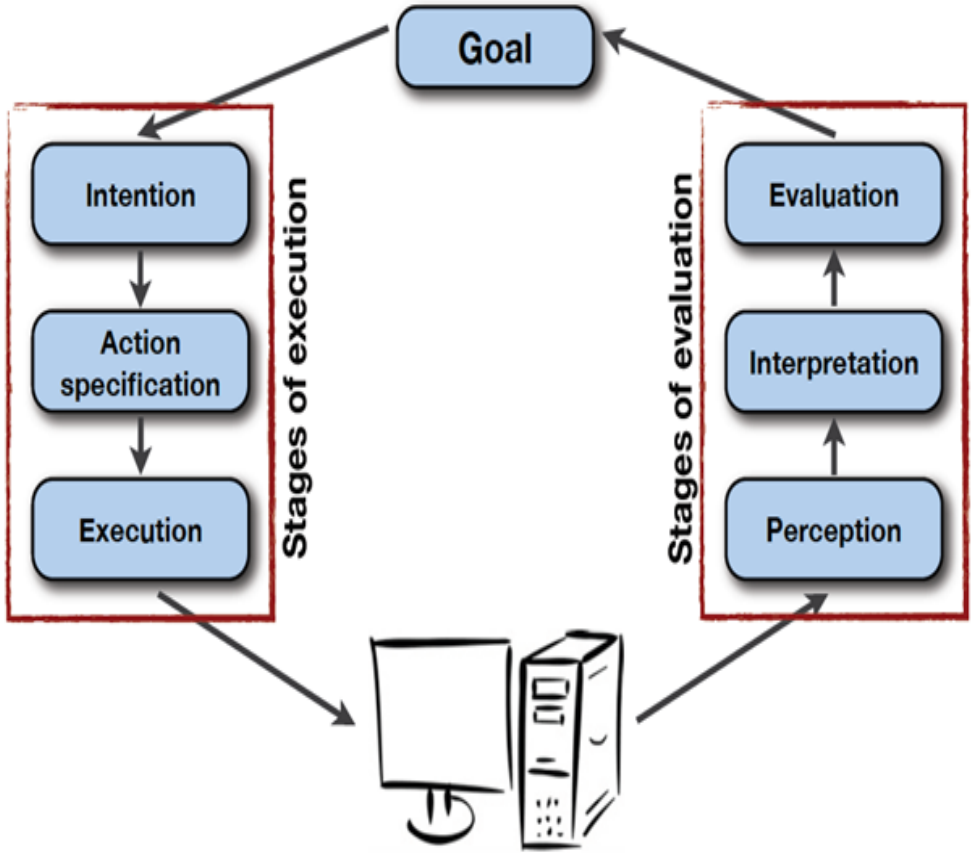
## Design Implications

- Transform goals into intentions and operating actions as easy as possible
- Possible actions are determinable in each situations
- Actions can be executed easily and robustly



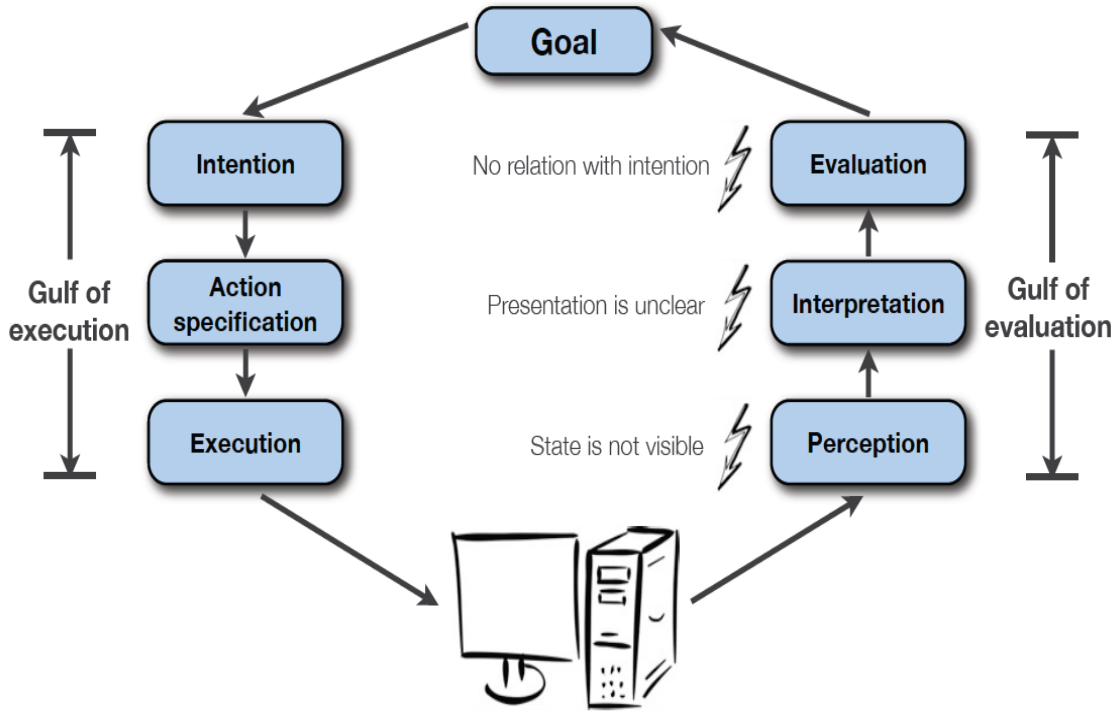
# Stages of Evaluation

5. **Perceiving the state of the world**: Use my senses to gather information about the world and/or system I'm working with
6. **Interpreting the state of the world**: Figure out what, if anything, has changed
7. **Evaluating the outcome**: Did I achieve my goal?



# Gulf of Evaluation

- Problems an individual face in understanding the effects of his/her actions and knows when his/her goals are satisfied.




## Design Implications

- The reaction of the system and its state are
  - recognizable at all times
  - easily interpretable
- A displayed or indicated new state is easily comparable with the goals of the user