Gulfs of Execution and Evaluation

CS 4163

Summer 2002

The gulfs are described in your textbook [4, p.273].

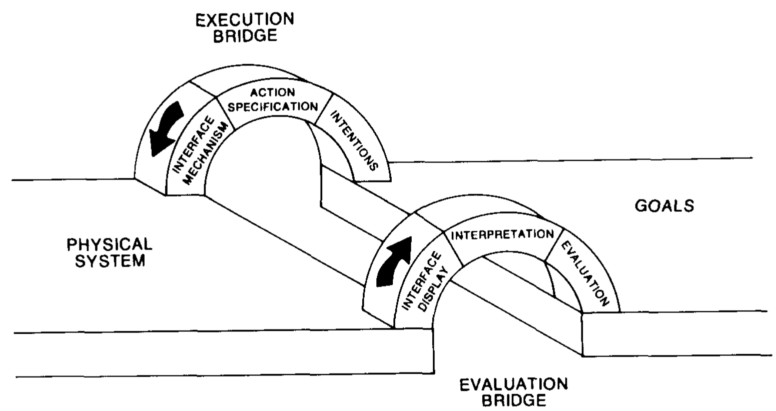

FIGURE 3.2. Bridging the Gulfs of Execution and Evaluation. The Gulf of *Execution* is bridged from the psychology side by the user's formation of intentions relevant to the system and the determination of an action sequence. It is bridged from the system side when the designer of the system builds the input characteristics of the interface. The Gulf of *Evaluation* is bridged from the psychology side by the user's perception of the system state and the interpretation placed on that perception, which is then evaluated by comparing it with the original goals and intentions. It is bridged from the system side when the designer builds the output characteristics of the interface.

Figure 1: Bridging The Gulfs (From a chapter by Norman [2, Figure 3.2, p. 40])

References

[1] Edwin L. Hutchins, James D. Hollan, and Donald A. Norman. Direct manipulation interfaces. In Norman and Draper [3], chapter 5, pages 87 – 124.

[2] Donald A. Norman. Cognitive engineering. In Norman and Draper [3], chapter 3, pages 31 – 61.

[3] Donald A. Norman and Stephen W. Draper, editors. *User Centered System Design: New Perspectives on Human-Computer Interaction*. Lawrence Erlbaum Associates, Publishers, Hillsdale, New Jersey and London, 1986. LCC=QA76.9.I58U73, ISBN=0-89859-781-1 (hc).

[4] Jenny Preece, Yvonne Rogers, Helen Sharp, David Benyon, Simon Holland, and Tom Carey. Cognitive issues in direct manipulation. In *Human-Computer Interaction*, section 13.7, pages 273 – 282. Prentice-Hall Europe, 1994. ISBN 0-201-62769-8.

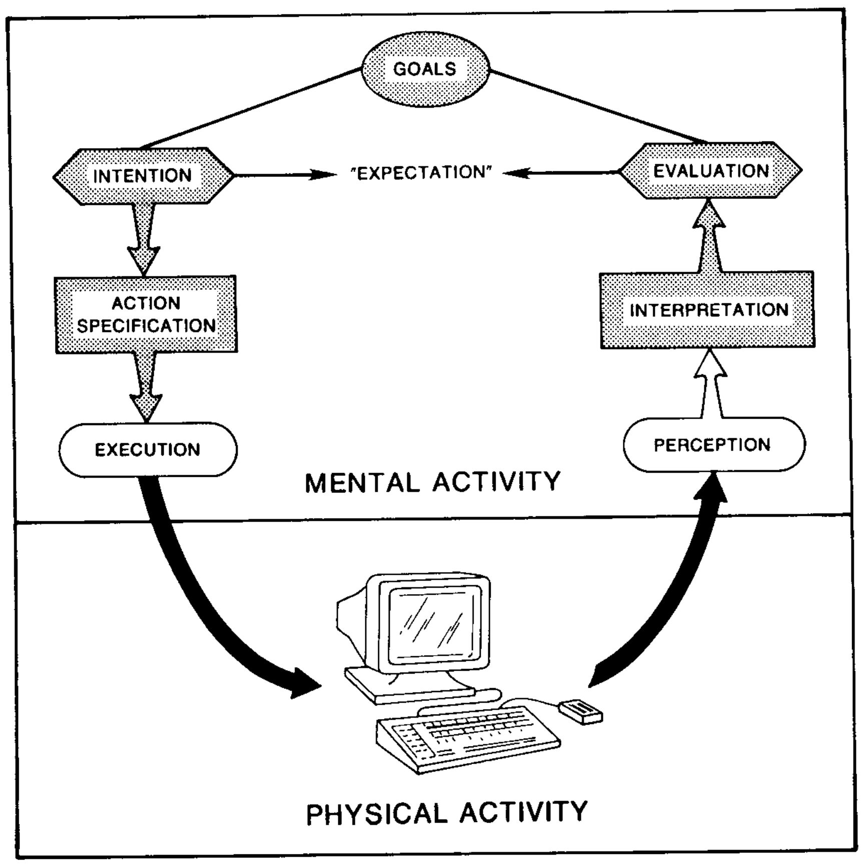

FIGURE 3.3. Seven stages of user activities involved in the performance of a task. The primary, central stage is the establishment of the goal. Then, to carry out an action requires three stages: forming the intention, specifying the action sequence, and executing the action. To assess the effect of the action also requires three stages, each in some sense complementary to the three stages of carrying out the action: perceiving the system state, interpreting the state, and evaluating the interpreted state with respect to the original goals and intentions.

Figure 2: Norman's Activity Model (From a chapter by Norman [2, Figure 3.3, p. 42])

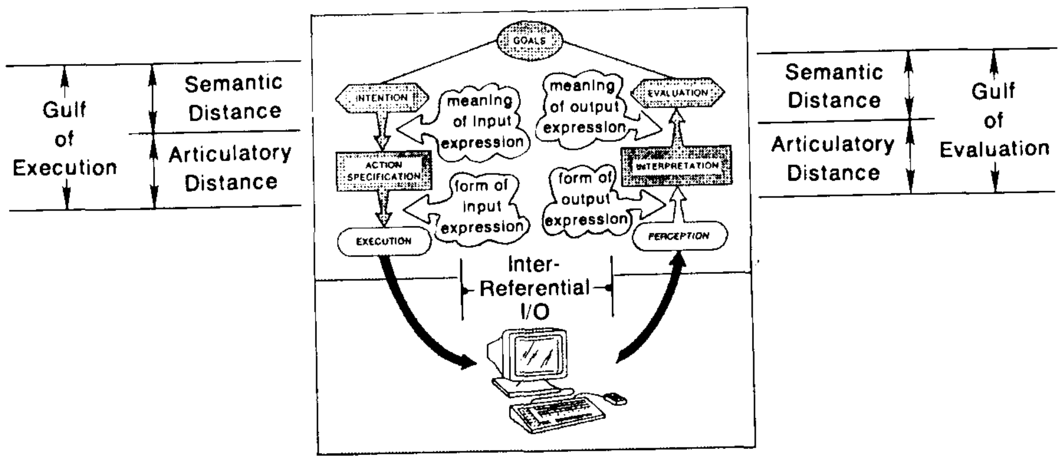

FIGURE 5.7. Forming an intention is the activity that spans semantic distance in the Gulf of Execution. The intention specifies the meaning of the input expression that is to satisfy the user's goal. Forming an action specification is the activity that spans articulatory distance in the Gulf of Execution. The action specification prescribes the form of an input expression having the desired meaning. The form of the input expression is executed by the user on the machine interface and the form of the output expression appears on the machine interface, to be perceived by the user. When some part of the form of a previous output expression is incorporated in the form of a new input expression, the input and output are said to be inter-referential. Interpretation is the activity that spans articulartory distance in the Gulf of Evaluation. Interpretation determines the meaning of the output expression from the form of the output expression. Evaluation is the activity that spans semantic distance in the Gulf of Evaluation. Evaluation assesses the relationship between the meaning of the output expression and the user's goal.

Figure 3: Incorporating Norman's Activity Model Into The Gulfs (From a chapter by Hutchins *et al.* [1, Figure 5.7,p. 111])