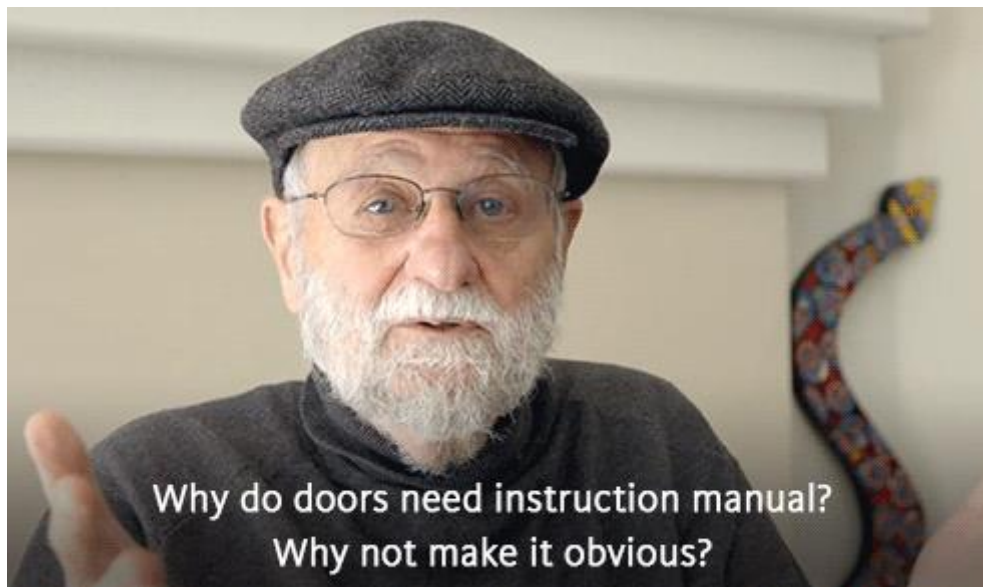


Chapter 5:

Models: The Psychology of Everyday Action

Overview

- 1 Introduction
- 2 Norman's model of interaction: Action Cycle
- 3 Gulf of Execution
- 4 Gulf of Evaluation
- 5 Evaluation and Design Questions
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Introduction

In 1990 Lucy Suchman published an article about problems in the communication between humans and machines. In her work, she criticises that the models we use are not taking humans' social behaviour into account. According to her, we should always keep in mind that human plans are often not orderly executed; they might be adapted or changed even during execution. Furthermore, we are in certain places, and at a particular time when we are interacting, so this can also impact communication.



As you noticed, this criticises the models you just learned about. In Fitts' law, GOMS, KLM and all the other models we explained to you, these factors cannot be considered. However, they give us a first reference point and a general framework for our design decision. Nevertheless, you should always be aware that reality and real interactions are much more complex than what our models can represent.



One aspect that Donald Norman stated in his work in 2002 is that people are often blaming themselves for problems that are actually caused by the design. If the system crashes and the user operated the system wrongly the user is blamed. Even though the interface might have not been guiding him sufficiently. Furthermore, people always try to explain actions and results, a random coincidence is just an insufficient explanation for most of us. As a result, we come up with assumptions about the causality that are probably not true.



L. Suchman, Plans and Situated Action:- The Problem of Human-Machine Communication. 1987, ISBN 978-0521337397

D. A. Norman. The Design of Everyday Things. Basic Books. 2002. ISBN: 978-0465067107

Norman's model of interaction: Action cycle

Every action we perform is directed to a certain goal. We could be asking ourselves: What do we want to happen, and what is the desired state we want to reach? According to Norman human action has two major aspects: Execution and evaluation.



Before we define our goal, we need to perceive the state of the world. This includes the interpretation and evaluation of what we perceived according to our own expectations. Based on this we can define a goal we want to reach.

This goal can be translated into an intention to act to achieve this goal. With this intention, we plan the actual sequence of actions that we need. Finally, we translate this plan into the physical execution.

Example:



You sit at home in your room and perceive your surroundings. You recognize that it is quite dark. With this perception you interpret: the light is not switched on and you start to evaluate whether the brightness is enough to learn for HCI.

You decide: No, it is too dark and formulate the goal that you want to get more light. To reach this goal, you have the intention to switch on the lamp. To do this, a sequence of actions is required: you stand up, go to the switch and finally press it. With your plan set: you actually stand up and execute this action.

Gulf of Execution

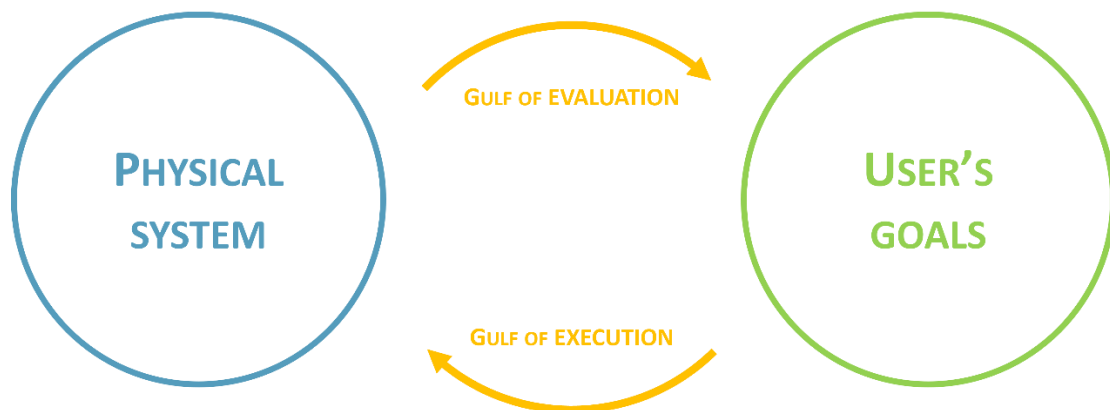
The difference between the intentions and the actions is called the **Gulf of Execution**. This gulf is on the one hand determined through environmental parameters, this could be the abilities of a person or legal restrictions. On the other hand, the design of a system itself. When designing a system think about how the actions can be accomplished and do the actions that can be taken in the system match the actions people intend to do.



Example:

A user wants a document written on the system in paper (goal).

What actions are permitted by the system to achieve this goal?



Good design minimizes the Gulf of Execution!

Gulf of Evaluation

The **Gulf of Evaluation** reflects the amount of effort needed to interpret the state of the system with regard to the intentions. As a designer always ask yourself: Is the information about the state of the system easily accessible and is it represented to ease matching with intentions?



Example:

A user wants a document written on the system in paper (goal).

Is the process observable? Are intermediate steps visible?



Good design minimizes the Gulf of Evaluation!

Evaluation and Design Questions

Execution

- Can the user tell what actions are possible?
- Does the interface help with mapping from intention to physical movement?
- Does the device easily support required actions?

Evaluation

- Can the user tell if the system is in the desired state?
- Can the user map from the system state to an interpretation?
- Can the user tell what state the system is in?

Implications on Design

Principles of good design (Norman):

- Stage and action alternatives should be always visible
- Good conceptual model with a consistent system image
- Interfaces should include good mappings that show the relationship between stages
- Continuous feedback to the user

Critical points/failures

- Inadequate goal formed by the user
- User does not find the correct interface or interaction object
- User may not be able to specify or execute the desired action
- Inappropriate or mismatching feedback

References

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