Les systèmes autonomes sont des outils informatiques comme les autres

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The design of everyday things

Don Norman
1988, 1990, 2002, 2013

THE PSYCHOLOGY OF EVERYDAY ACTIONS

During my family's stay in England, we rented a furnished house while the owners were away. One day, our landlady returned to the house to get some personal papers. She walked over to the old, metal filing cabinet and attempted to open the top drawer. It wouldn't open. She pushed it forward and backward, right and left, up and down, without success. I offered to help. I wiggled the drawer. Then I twisted the front panel, pushed down hard, and banged the front with the palm of one hand. The cabinet drawer slid open. "Oh," she said, "I'm sorry. I am so bad at mechanical things." No, she had it backward. It is the mechanical thing that should be apologizing, perhaps saying, "I'm sorry. I am so bad with people."

My landlady had two problems. First, although she had a clear goal (retrieve some personal papers) and even a plan for achieving that goal (open the top drawer of the filing cabinet, where those papers are kept), once that plan failed, she had no idea of what to do. But she also had a second problem: she thought the problem lay in her own lack of ability: she blamed herself, falsely.

How was I able to help? First, I refused to accept the false accusation that it was the fault of the landlady: to me, it was clearly a fault in the mechanics of the old filing cabinet that prevented the drawer from opening. Second, I had a conceptual model of how the cabinet worked, with an internal mechanism that held the door shut in normal usage, and the belief that the drawer mechanism was probably out of alignment. This conceptual model gave me a plan: wiggle the drawer. That failed. That caused me to modify

my plan: wiggling may have been appropriate but not forceful enough, so I resorted to brute force to try to twist the cabinet back into its proper alignment. This felt good to me—the cabinet drawer moved slightly—but it still didn't open. So I resorted to the most powerful tool employed by experts the world around—I banged on the cabinet. And yes, it opened. In my mind, I decided (without any evidence) that my hit had jarred the mechanism sufficiently to allow the drawer to open.

This example highlights the themes of this chapter. First, how do people do things? It is easy to learn a few basic steps to perform operations with our technologies (and yes, even filing cabinets are technology). But what happens when things go wrong? How do we detect that they aren't working, and then how do we know what to do? To help understand this, I first delve into human psychology and a simple conceptual model of how people select and then evaluate their actions. This leads the discussion to the role of understanding (via a conceptual model) and of emotions: pleasure when things work smoothly and frustration when our plans are thwarted. Finally, I conclude with a summary of how the lessons of this chapter translate into principles of design.

How People Do Things: The Gulfs of Execution and Evaluation

When people use something, they face two gulfs: the Gulf of Execution, where they try to figure out how it operates, and the Gulf of Evaluation, where they try to figure out what happened (Figure 2.1). The role of the designer is to help people bridge the two gulfs.

In the case of the filing cabinet, there were visible elements that helped bridge the Gulf of Execution when everything was working perfectly. The drawer handle clearly signified that it should be pulled and the slider on the handle indicated how to release the catch that normally held the drawer in place. But when these operations failed, there then loomed a big gulf: what other operations could be done to open the drawer?

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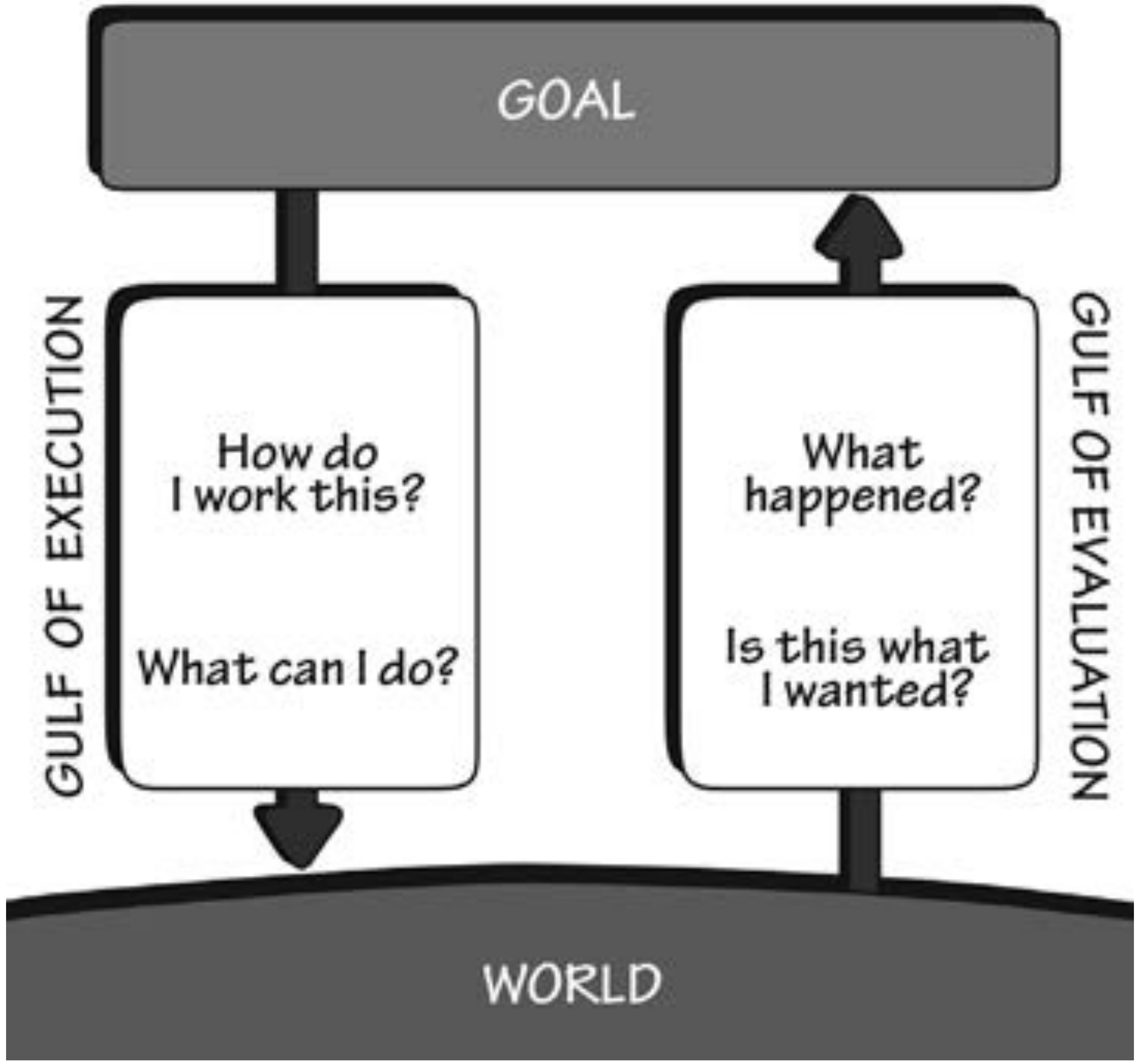

The gulfs of execution and evaluation

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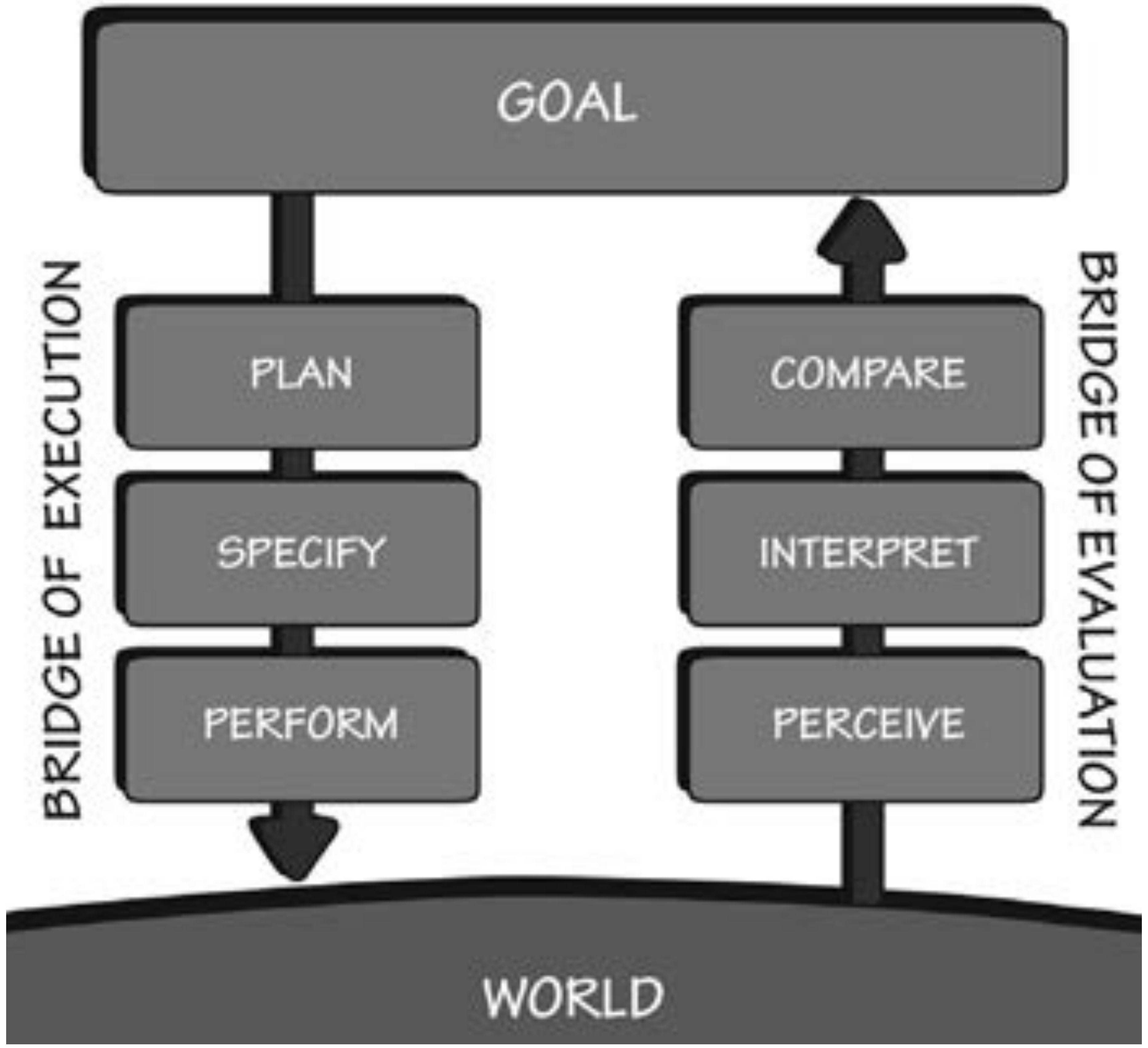

The seven stages of the action cycle

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Discoverability

Feedback

Conceptual model

Affordances

Signifiers

Mappings

Constraints

Modèle conceptuel

Ce que nous croyons savoir sur un objet, une procédure, un système

Construit sur la base de connaissances et d'expériences

Non nécessairement complet ou correct, mais "suffisamment bon" pour être utile

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Don Norman
1988, 1990, 2002, 2013

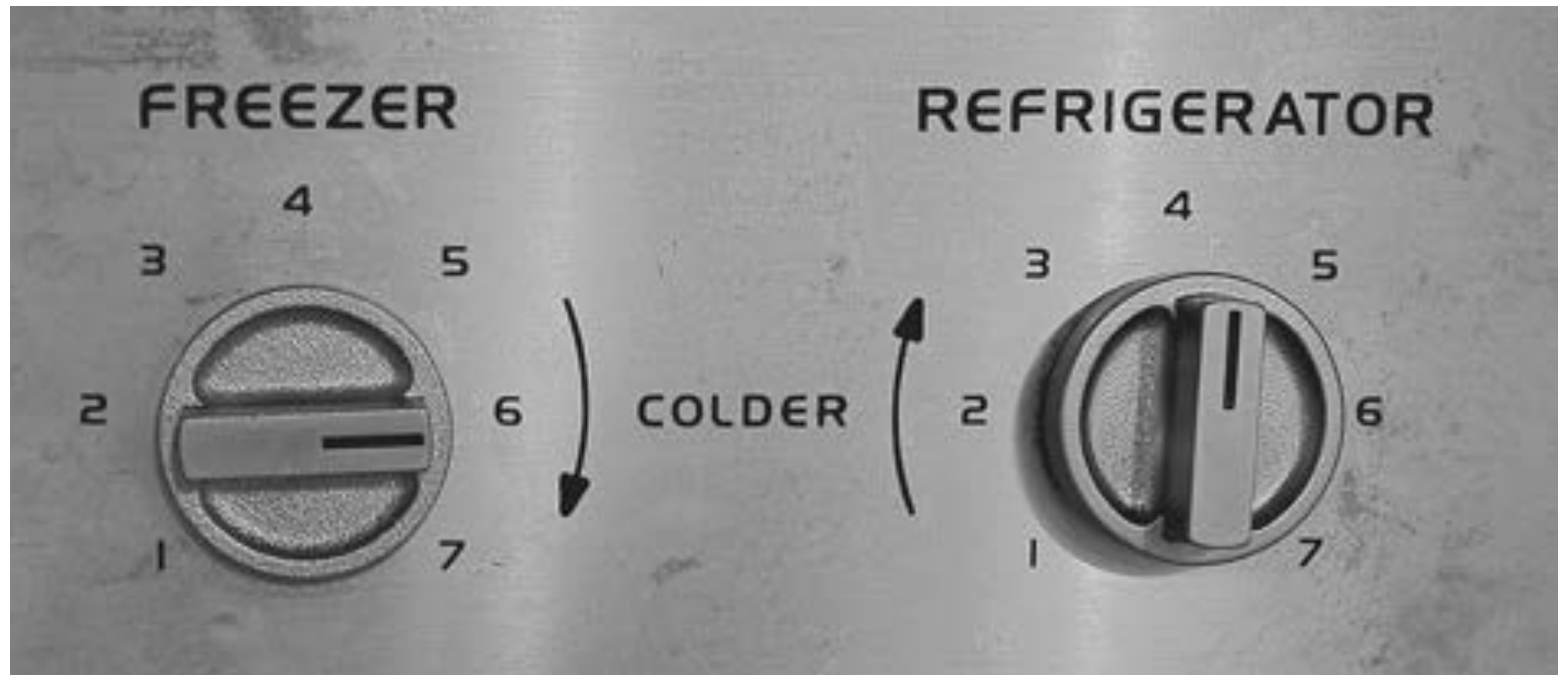


FIGURE 1.9. **Refrigerator Controls.** Two compartments—fresh food and freezer—and two controls (in the fresh food unit). Your task: Suppose the freezer is too cold, the fresh food section just right. How would you adjust the controls so as to make the freezer warmer and keep the fresh food the same? (Photograph by the author.)

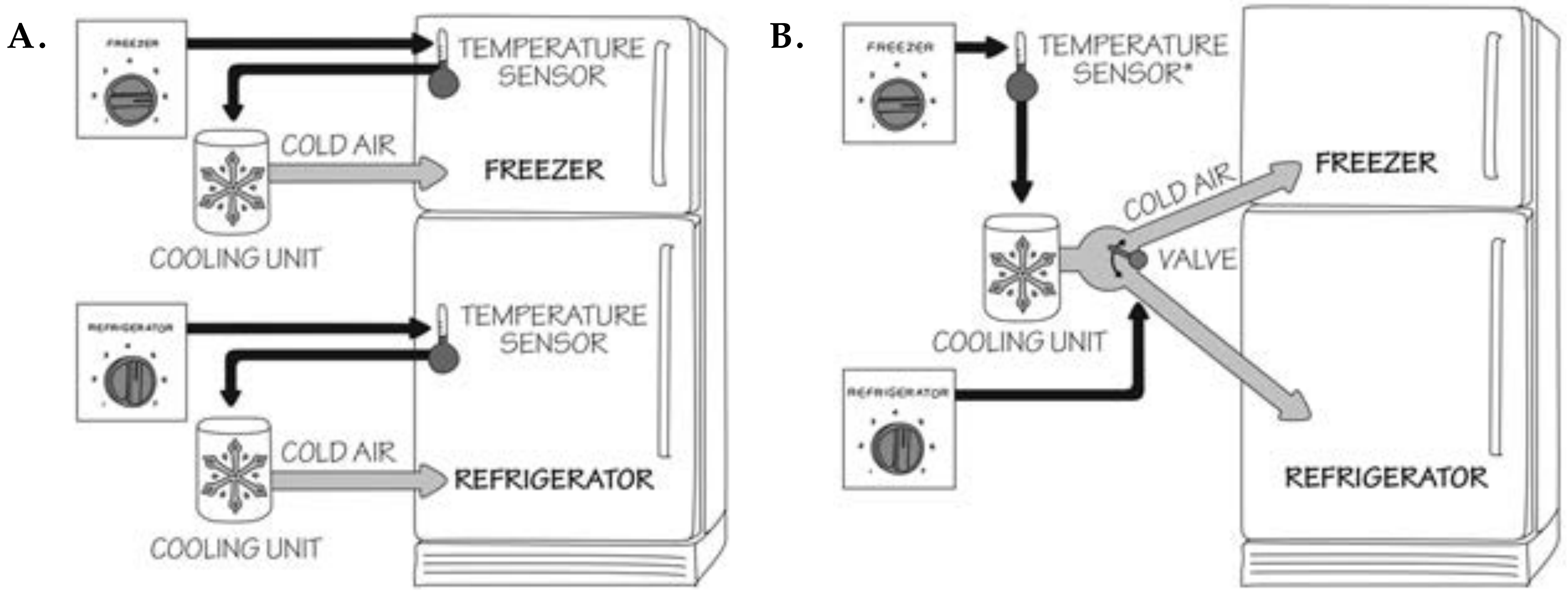


FIGURE 1.10. **Two Conceptual Models for a Refrigerator.** The conceptual model A is provided by the system image of the refrigerator as gleaned from the controls. Each control determines the temperature of the named part of the refrigerator. This means that each compartment has its own temperature sensor and cooling unit. This is wrong. The correct conceptual model is shown in B. There is no way of knowing where the temperature sensor is located so it is shown outside the refrigerator. The freezer control determines the freezer temperature (so is this where the sensor is located?). The refrigerator control determines how much of the cold air goes to the freezer and how much to the refrigerator.

Modèle conceptuel et interaction Homme-Machine

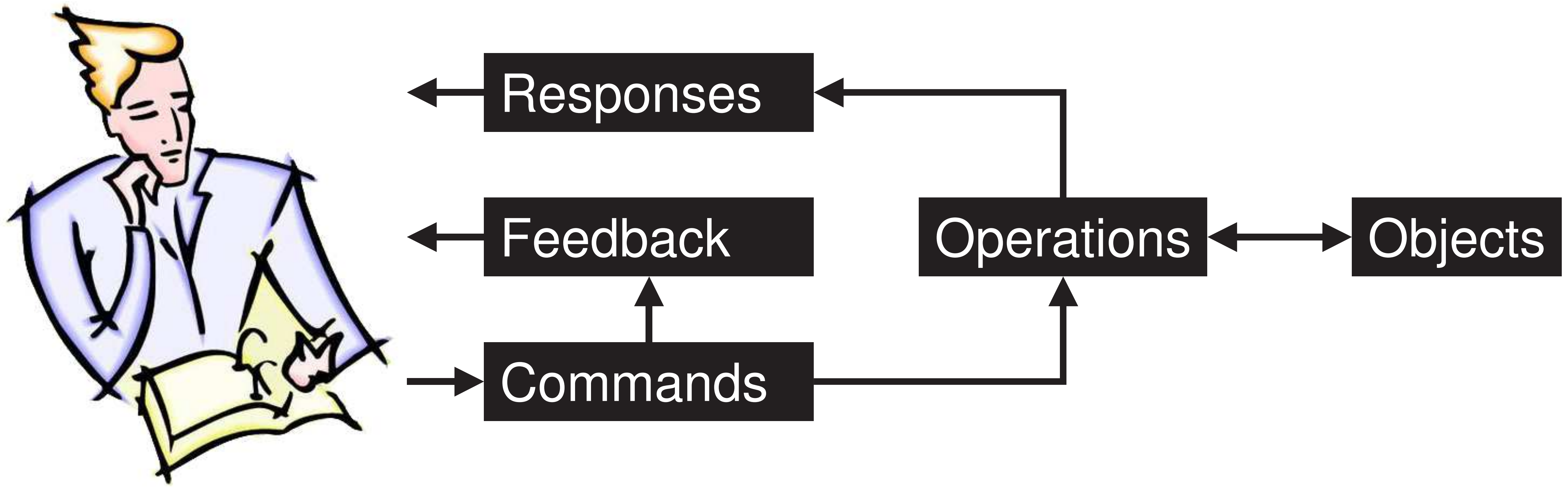
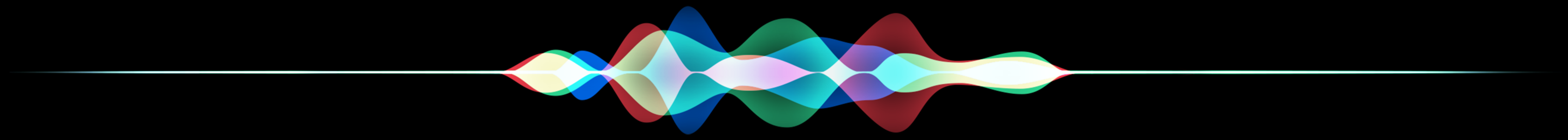


Fig. 1. Conceptual model of human-computer system



Amazon’s Alexa started ordering people dollhouses after hearing its name on TV

Google’s Super Bowl ad accidentally set off a lot of Google Homes

Amazon's Echo is bringing the eighties back, and not always in a good way

https://youtu.be/4aGXEJ_9G3Y

https://youtu.be/uCezICQNgJU

https://youtu.be/gUlKtqyUlo8

Comment savoir
ce que sait faire un système autonome ?

Comment savoir
ce que sait faire un système autonome ?

Comment savoir ce qu’il ne sait pas faire ?

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Comment savoir ce qu'il fait ?

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ce que sait faire un système autonome ?

Comment savoir ce qu’il ne sait pas faire ?

Comment savoir ce qu’il fait ?

**Comment comprendre
pourquoi et comment il le fait ?**

Comment savoir
ce que sait faire un système autonome ?

Comment savoir ce qu’il ne sait pas faire ?

Comment savoir ce qu’il fait ?

Comment comprendre
pourquoi et comment il le fait ?

Comment influer sur ce qu’il fait ?

Comment savoir
ce que sait faire un système autonome ?

Comment savoir ce qu’il ne sait pas faire ?

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Comment comprendre
pourquoi et comment il le fait ?

Comment influer sur ce qu’il fait ?

Comment lui (re)prendre le contrôle ?

Comment savoir
ce que sait faire un système autonome ?

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Comment savoir ce qu’il fait ?

Comment comprendre
pourquoi et comment il le fait ?

Comment influer sur ce qu’il fait ?

Comment lui (re)prendre le contrôle ?

Veut-on réellement de ce système ?

Les systèmes autonomes sont des outils informatiques comme les autres

La technologie n'est pas une chose qui "arrive"

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une chose qui "arrive"

**La technologie se décide,
elle se conçoit**

Pourquoi fait-on ces choses ?

Pour quoi fait-on ces choses ?

"*Because we can*" ?

"*Because we can't*" ?

So, they've started psi research because they thought we were doing psi research, when in fact we weren't doing psi research?

Yes, sir. But now that they're doing psi research, we're gonna have to do psi research, sir.

Comment fait-on ces choses ?

[..............] by design

"*l'humain dans la boucle*" ?

Science finds,
Industry applies,
Man adapts

Exposition universelle, 1833

People propose,
Science studies,
Technology conforms

Don Norman, 1993

L'informatique doit être
au service de chaque citoyen

Loi n° 78-17 du 6 janvier 1978 relative à l'informatique, aux fichiers et aux libertés