# Tech-Life 4.1 — Comment les technologies changent et changeront votre vie

8 avril 2017, Auditorium des Beaux Arts, Lille

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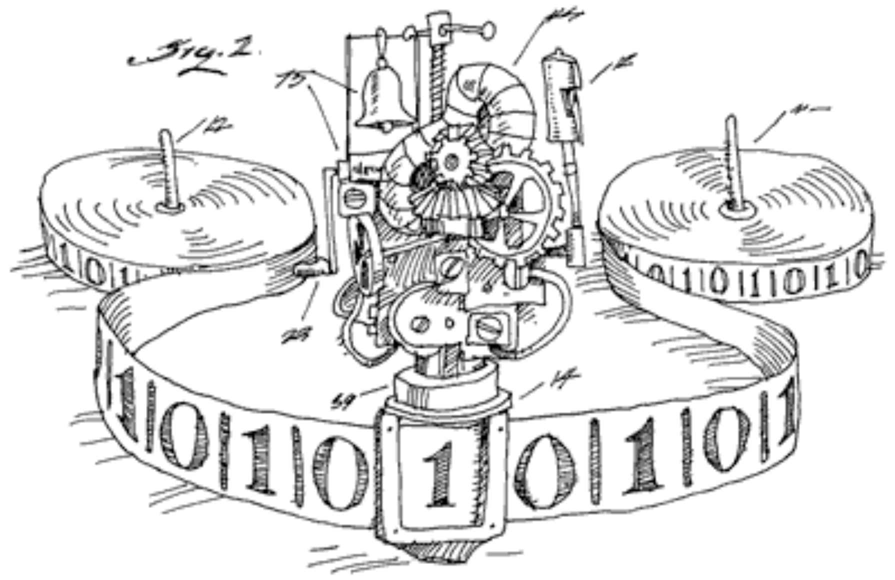
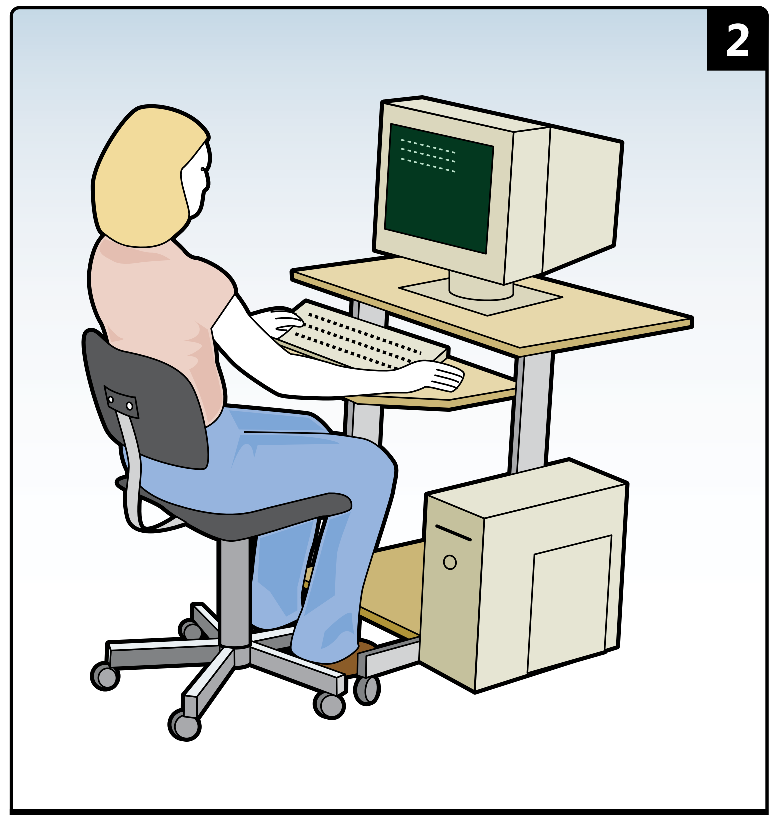
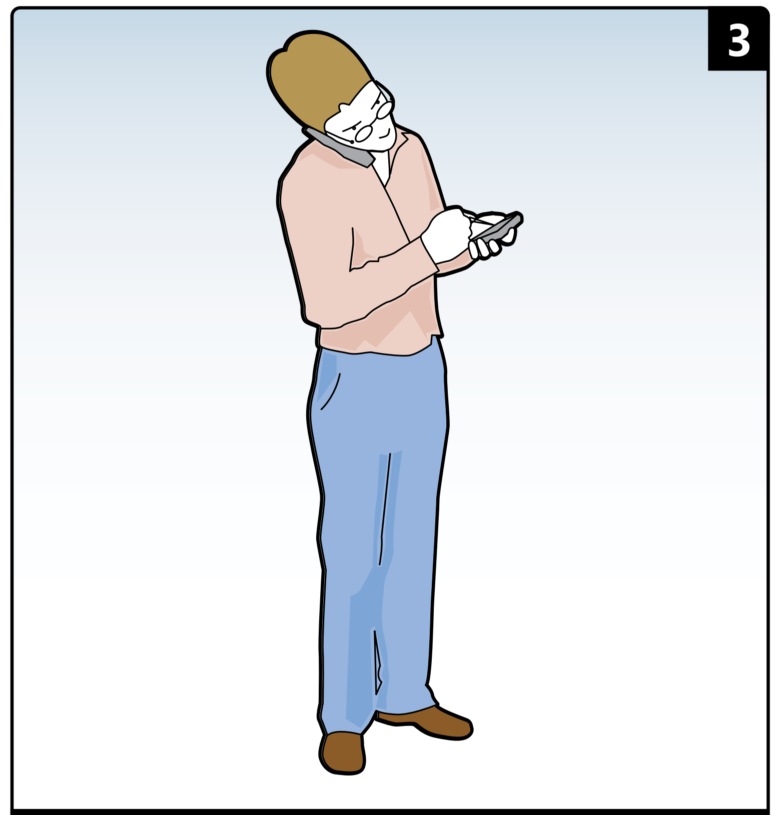


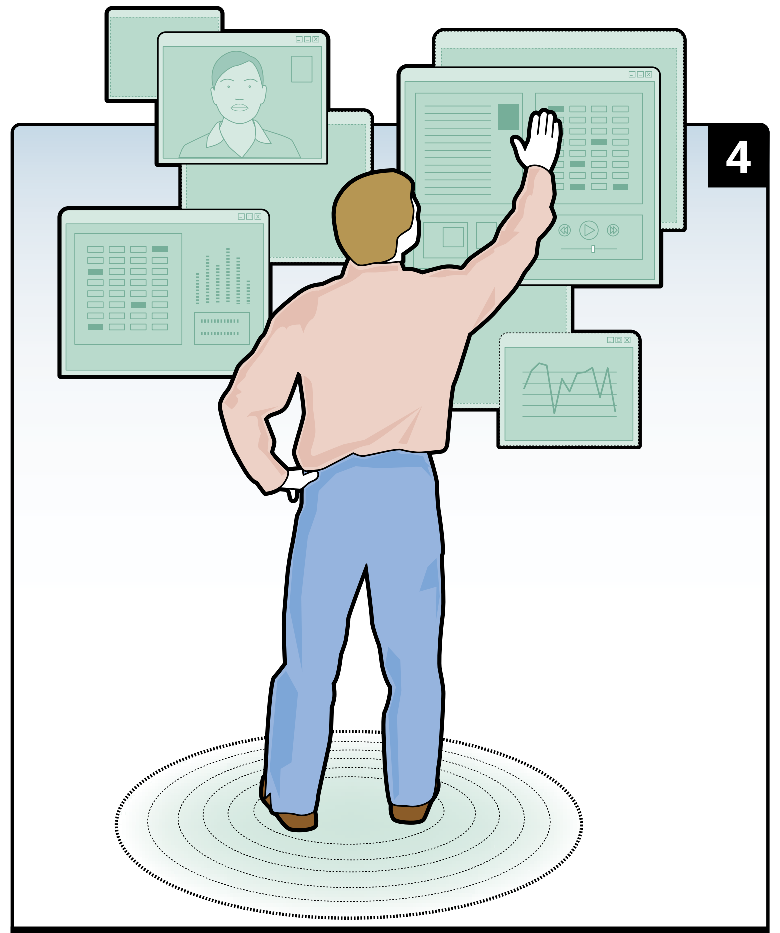

1960s: Mainframe Era
One computer per many users.




1980s: Personal Computer Era
One computer per user.




2000s: Mobility Era
Several computers per user.




2020 and beyond: Ubiquity Era
Thousands of computers per user.

Being human: Human-Computer Interaction in the year 2020
Harper, Sellen, Rodden & Rogers, editors

Sketching User Experie
getting the design rig
Bill Buxton
DESIGNING INTERACTIONS
BILL MOGGRIDGE
Bringing Design to Software
Terry Winograd
Helvetica
A documentary film by Gary Hustwit
Objectified.
Urbanized.
THE HUMANE INTERFACE
Jef Raskin
THINGS THAT MAKE US SMART
DEFENDING HUMAN ATTRIBUTES IN THE AGE OF THE MACHINE
DONALD A. NORMAN
The DESIGN of EVERYDAY THINGS
DON NORMAN
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James J. Gibson

# *The design of everyday things*

Don Norman
1988, 1990, 2002, 2013

CHAPTER TWO

## 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.

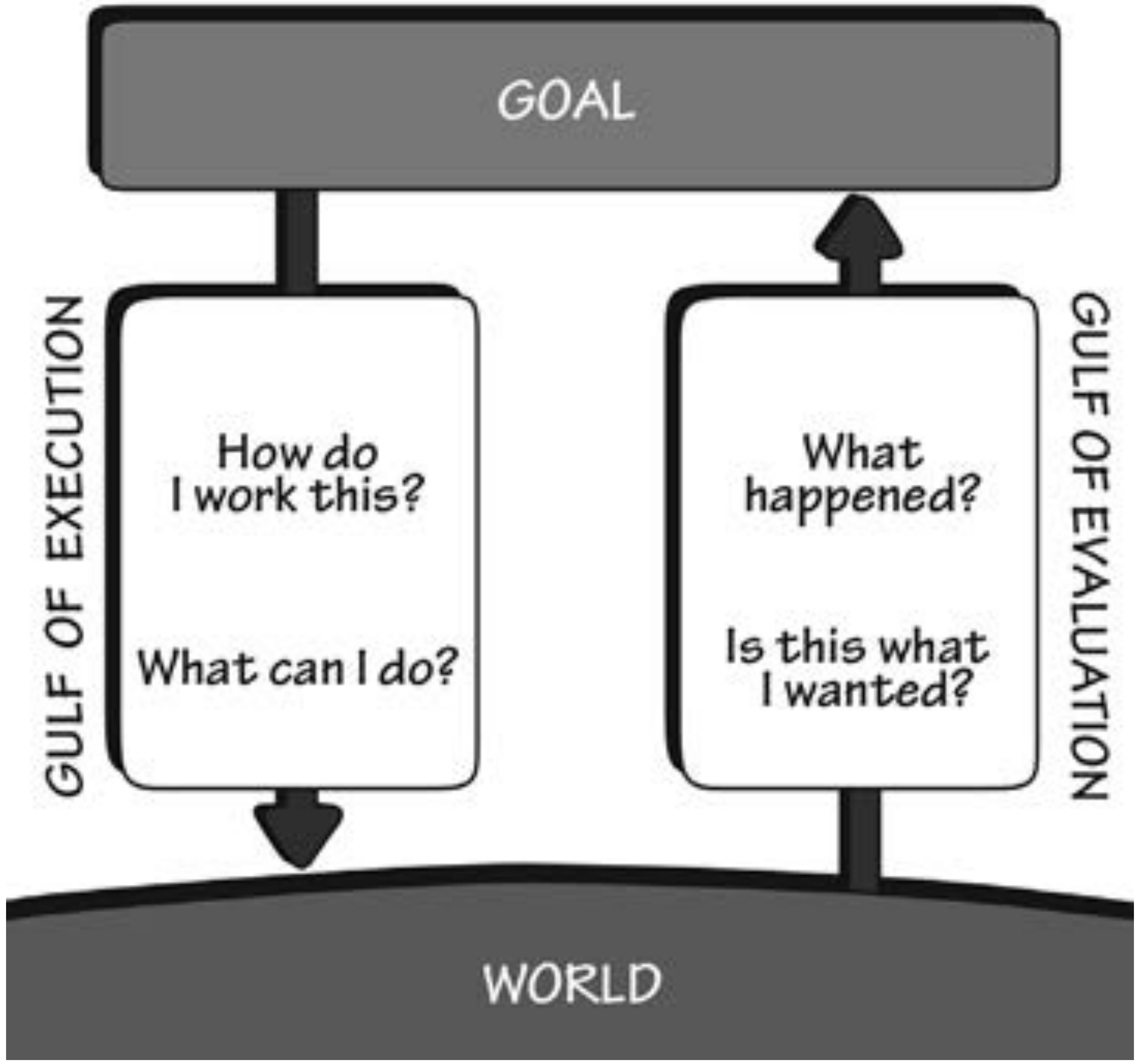
### How People Do Things: The Gulfs of Execution and Evaluation

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?

***The design of everyday things***

Don Norman
1988, 1990, 2002, 2013




*The gulfs of execution and evaluation*

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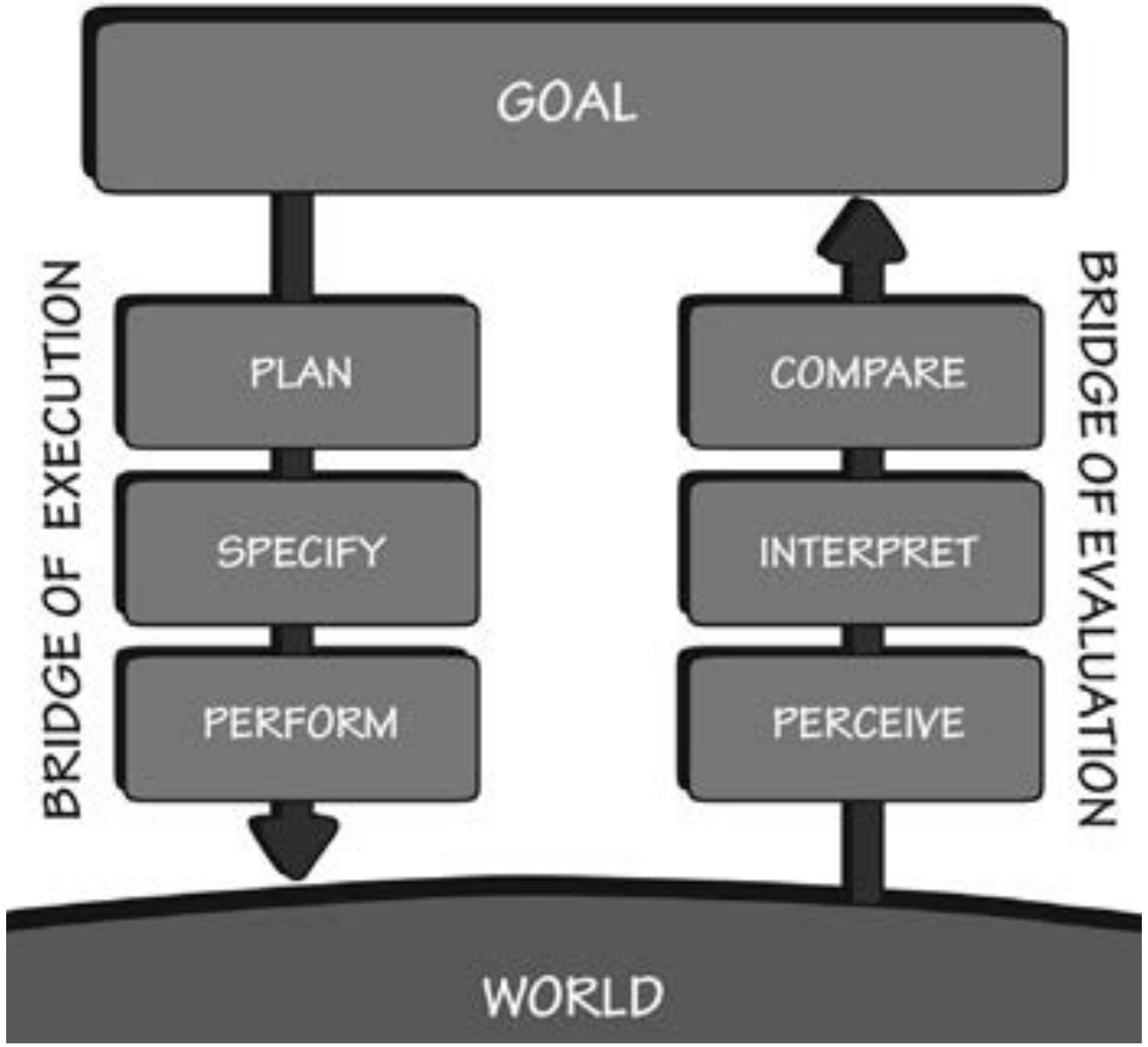



*The seven stages of the action cycle*

## 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

# *The design of everyday things*

Don Norman
1988, 1990, 2002, 2013

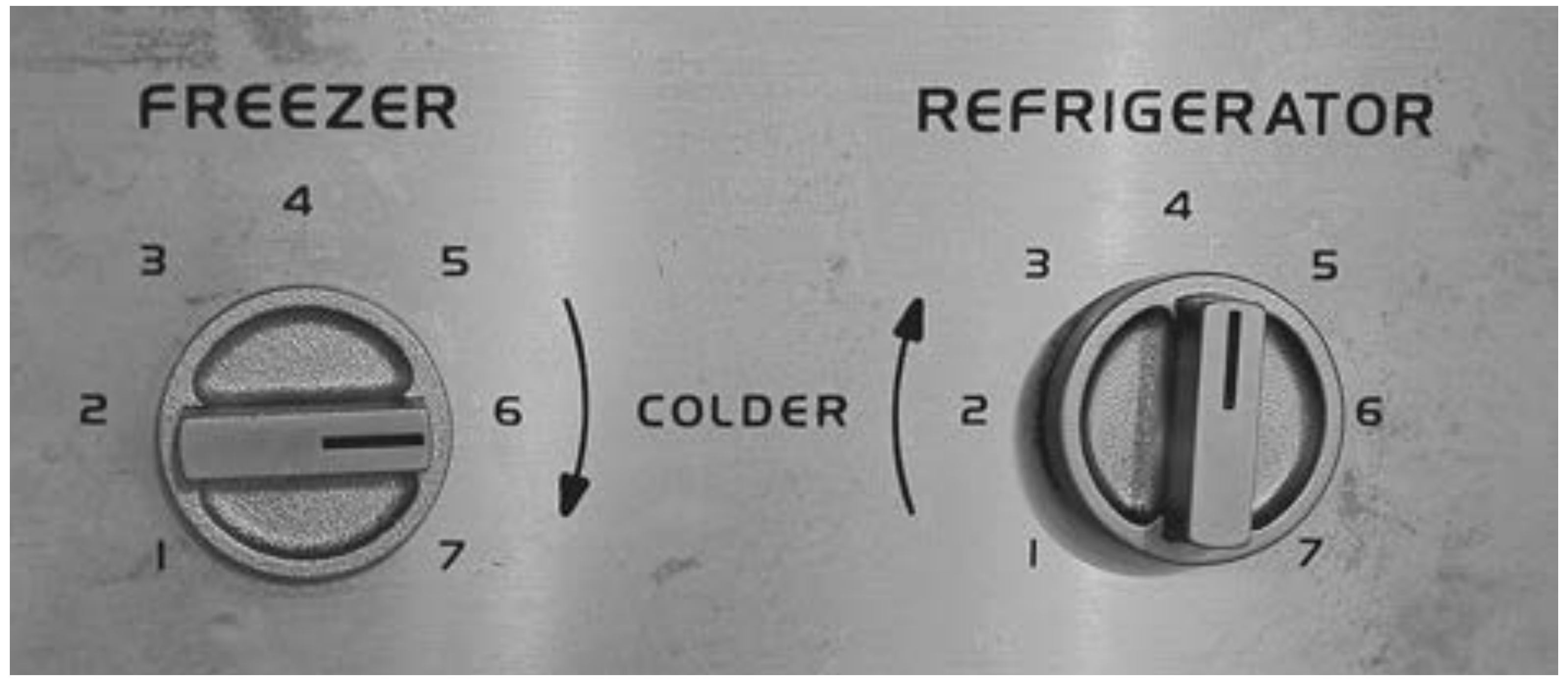



FIGURE 1.9. **Refrigerator Controls.** Two compartments—fresh food and freezer—and two controls (in the fresh food unit). Your task: Suppose the freezer is too cold, the fresh food section just right. How would you adjust the controls so as to make the freezer warmer and keep the fresh food the same?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

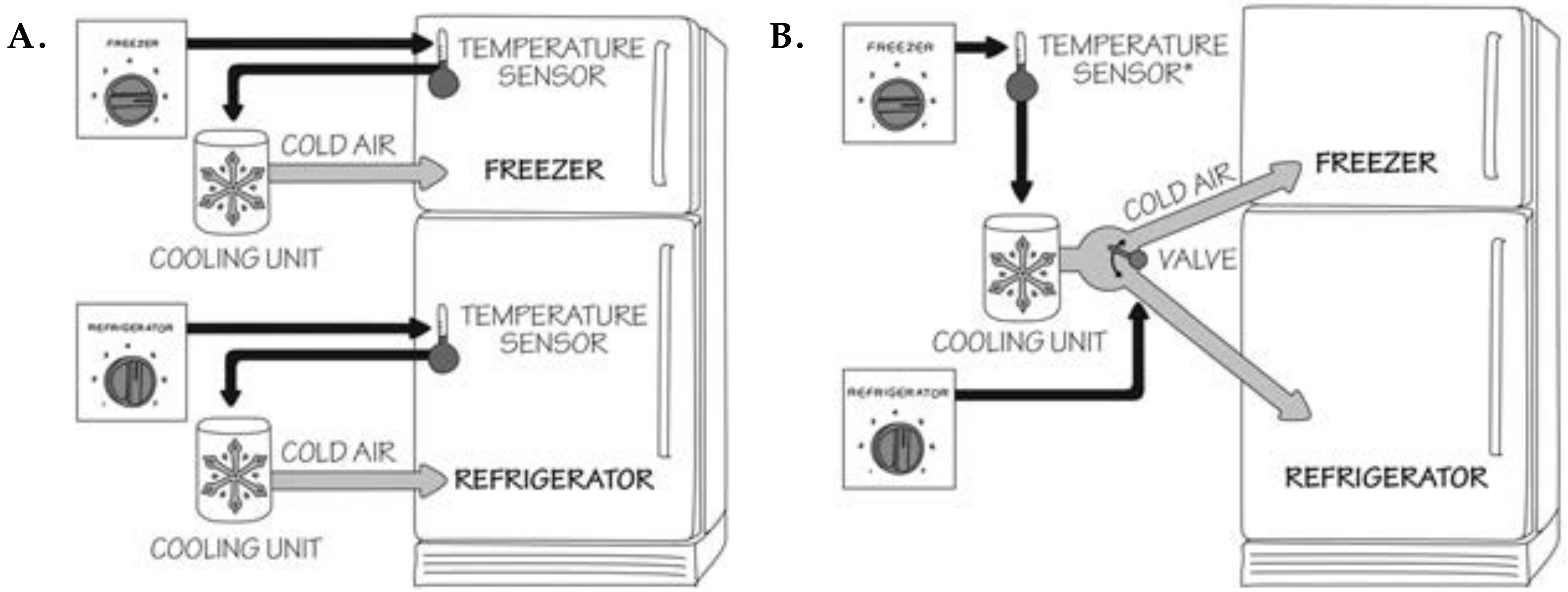


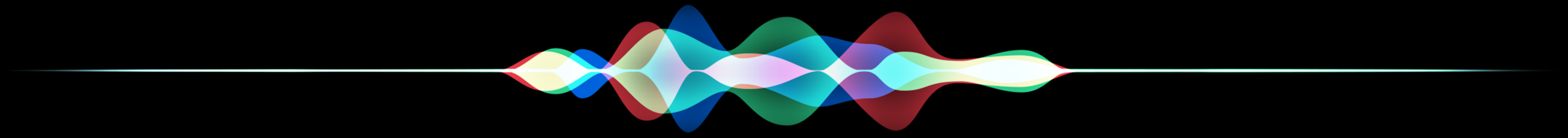

FIGURE 1.10. **Two Conceptual Models for a Refrigerator.** The conceptual model A is provided by the system image of the refrigerator as gleaned from the controls. Each control determines the temperature of the named part of the refrigerator. This means that each compartment has its own temperature sensor 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.

## *Rendre les choses visibles*

Rendre les choix visibles

Rendre les effets des actions visibles

Permettre de déterminer facilement l'état du système



*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 ?**

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 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 ?**

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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 influer sur ce qu’il 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 ?

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**Comment lui (re)prendre le contrôle ?**

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 lui (re)prendre le contrôle ?

**Veut-on réellement de ce système ?**

**L'outil transparent n'est pas celui que vous ne pouvez pas voir**

L'outil transparent n'est pas celui que vous ne pouvez pas voir

**C'est celui qui ne vous gêne pas mais vous laisse vous concentrer sur votre tâche**

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

La technologie n'est pas
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*

*Human in the loop?*

***Quel droit avons-nous de rejeter un futur que nous n'avons pas pris la peine de penser ?***

Futur en Seine / Cap Digital, 3 avril 2017

***Do we have the right to reject a future that we didn't imagine ourselves?***

Futur en Seine / Cap Digital, 3 avril 2017

***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*