

Mobile and Context-aware Interactive Systems



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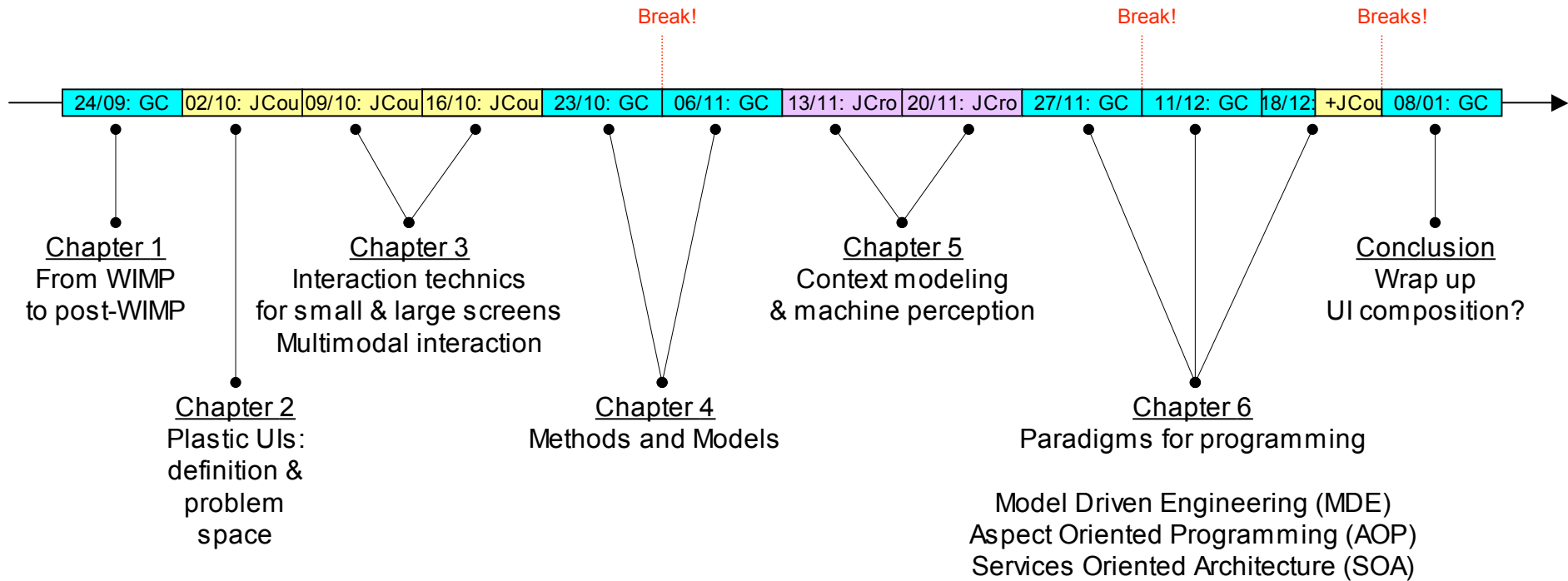
Main goals of the course

- Discover the technical advances that may have an impact on the engineering of innovative interactive systems
 - Context: Ambient intelligence
 - Focus: Mobile computing & Context-aware computing

- Be able to envision and develop innovative interactive systems
 - Design
 - Implementation
 - Evaluation



Outline and schedule



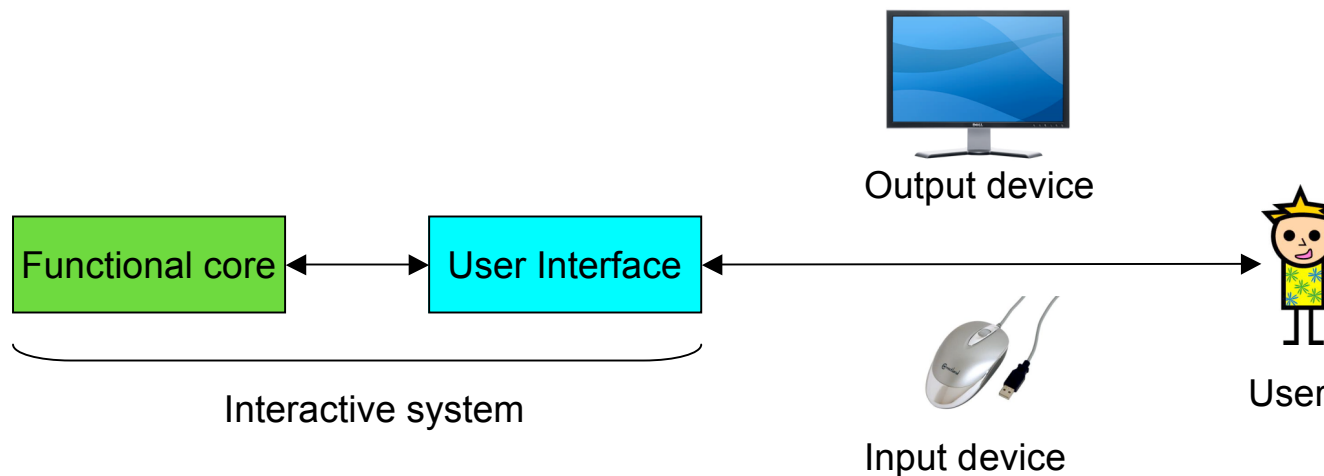
GC: Gaëlle Calvary
JCou: Joëlle Coutaz
JCro: James Crowley



Exercise 1

- What does *innovation* mean?
- Are there systems you *dream on*?
- Are there situations in which you would like to get a computer-based support?
- What does *push technology* mean?
- What's your feeling about it?

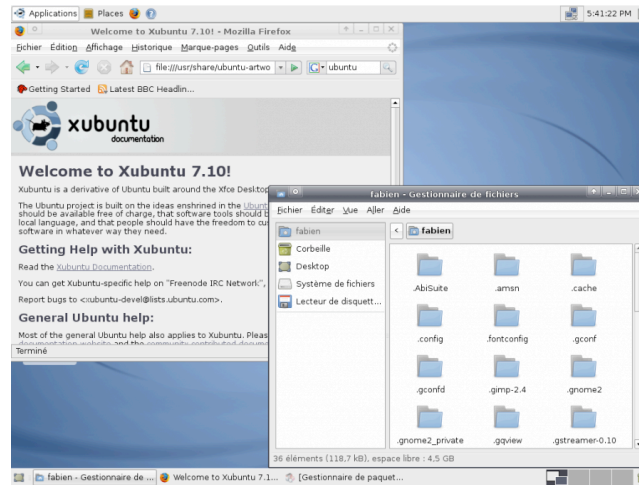
- Human-Computer Interaction (HCI)
 - Discipline: the goal is to design and produce systems that are
 - Useful: provide the appropriate functions to the target users
 - Usable: are compliant with the user's perceptual, cognitive, and motor abilities
 - In context!
 - Cycles of actions between the user and the system





Chapter 1: From WIMP to Post-WIMP

- WIMP: Window, Icon, Menu, Pointing device
 - Style of interaction ... almost Graphical User Interfaces (GUI)



- Developed at Xerox PARC (1983), made popular by Macintosh (1984)



Englebart



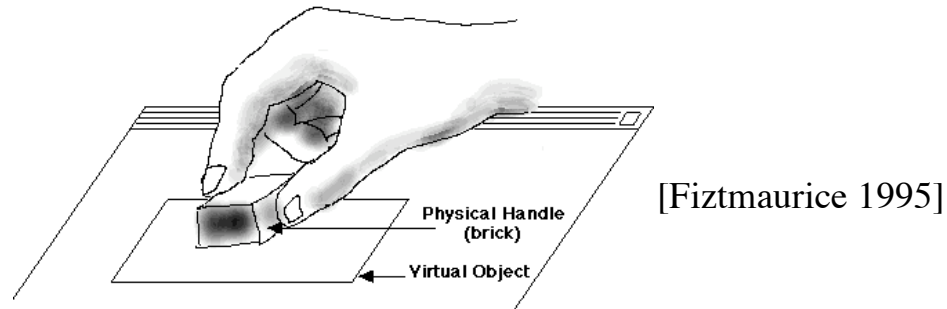
Chapter 1: From WIMP to Post-WIMP

- *Post-WIMP: From GUI to mixed UIs*
 - A reaction to the « pure virtual »
 - Goal: to take the best from the two worlds

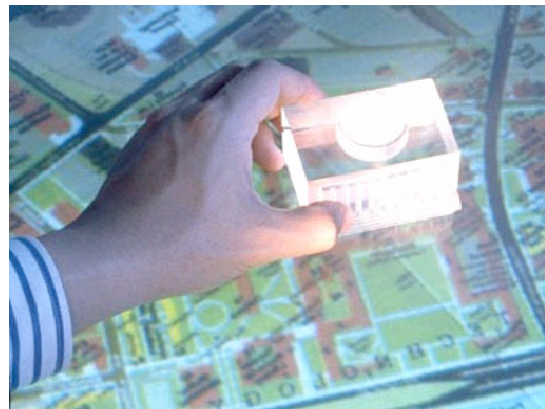


Digital Desk [Wellner 1992]

- *Post-WIMP: From GUI to mixed UIs*
 - Physical objects as input devices: Graspable UIs
 - *Physical* instruments to grasp and manipulate *digital* elements



- Physical icons (Phicons) to embody the form of objects and provide dedicated input devices



- *Post-WIMP*: From GUI to mixed UIs
 - Physical objects as input devices: Graspable UIs
 - With multiple input devices



The Sense Table
[Hiroshii Ishii, MIT Media Lab]

- With fingers as instruments



Magic Board [Bérard 2000]



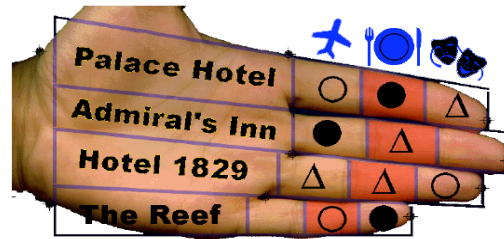


Chapter 1: From WIMP to Post-WIMP

- *Post-WIMP: From GUI to mixed UIs*
 - Physical objects as input devices
 - Brain UIs



- *Post-WIMP: From GUI to mixed UIs*
 - Physical objects as output devices

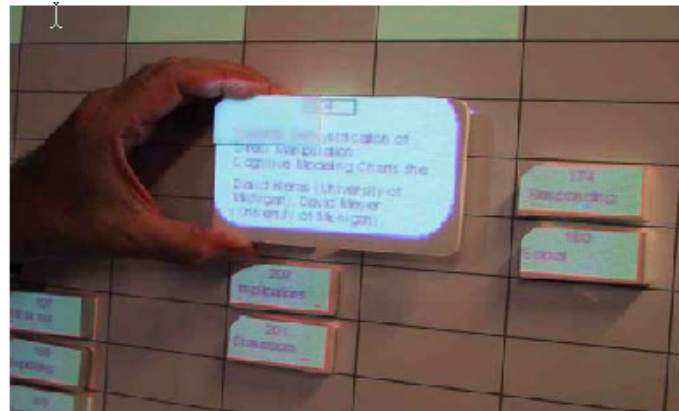


[Antoniac, 2002]



[Borkowski, 2004]

- Physical objects as input and output devices



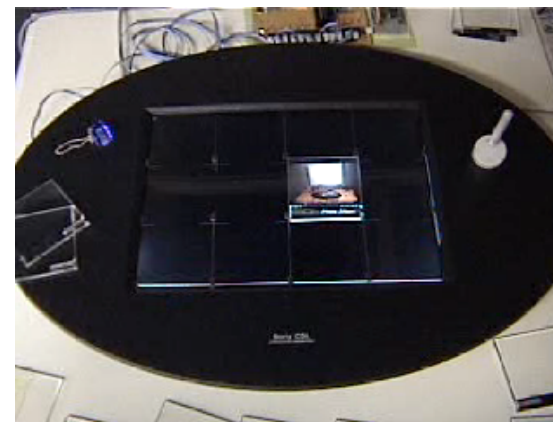
SenseBoard [R. Jacob et al.]

Chapter 1: From WIMP to Post-WIMP

- *Post-WIMP: From GUI to mixed UIs*
 - Interconnected physical objects as input and output devices



[Hinckley 03]



[Rekimoto 01]



Chapter 1: From WIMP to Post-WIMP

- *Post-WIMP: From GUI to mixed UIs*



The Magic Book [Univ. Washington]



Tangible Hamster [Hiroshi Ishii, MIT Media Lab]

Chapter 1: From WIMP to Post-WIMP



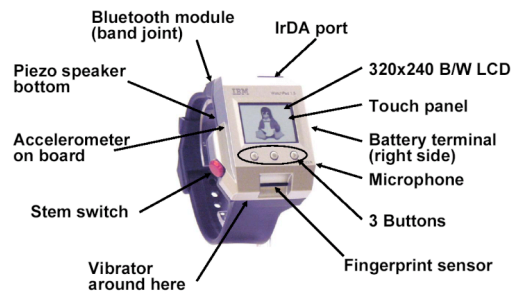
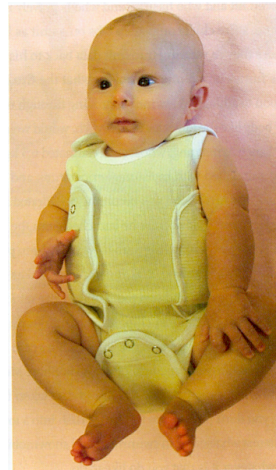
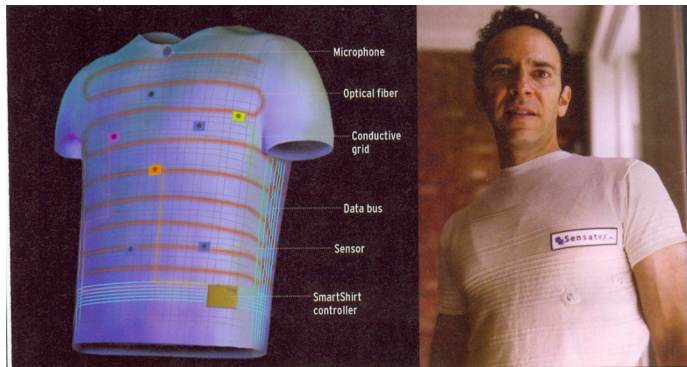
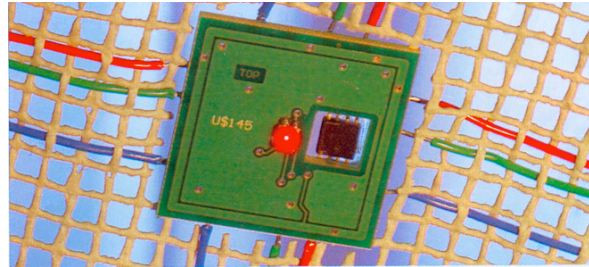
[The Economist, avril 07]



Exercise 2

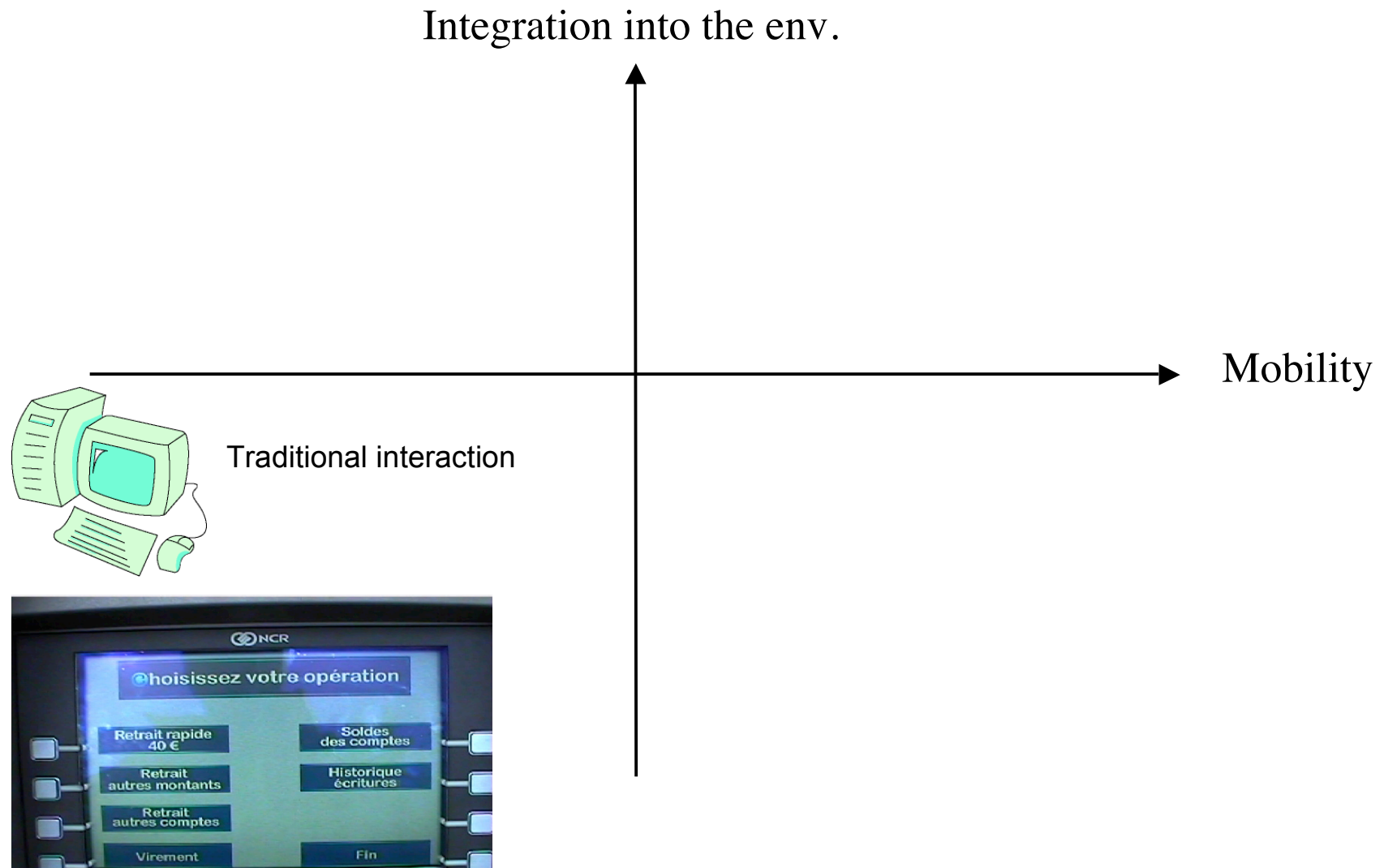
- Which objects would you like to augment? When? Why?
- What about the costs, benefits and ... ethics?

- Beyond physicality ... mobility
 - Mobile platforms: PDAs, smartphones, gameboys...
 - Wearable computing



IBM WatchPad 1.5

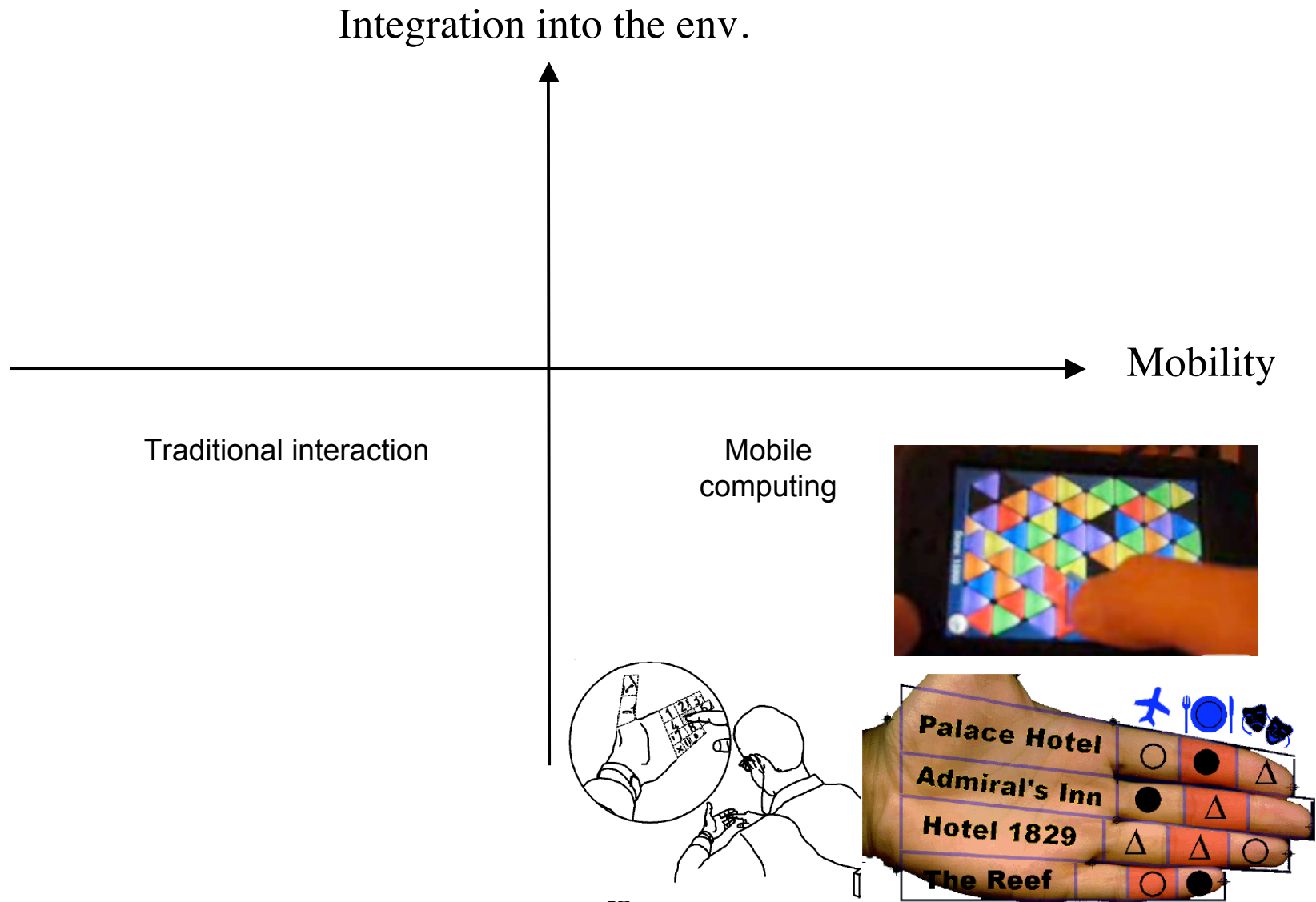
[Lyytinen & Yoo 2002]





Chapter 1: From WIMP to Post-WIMP

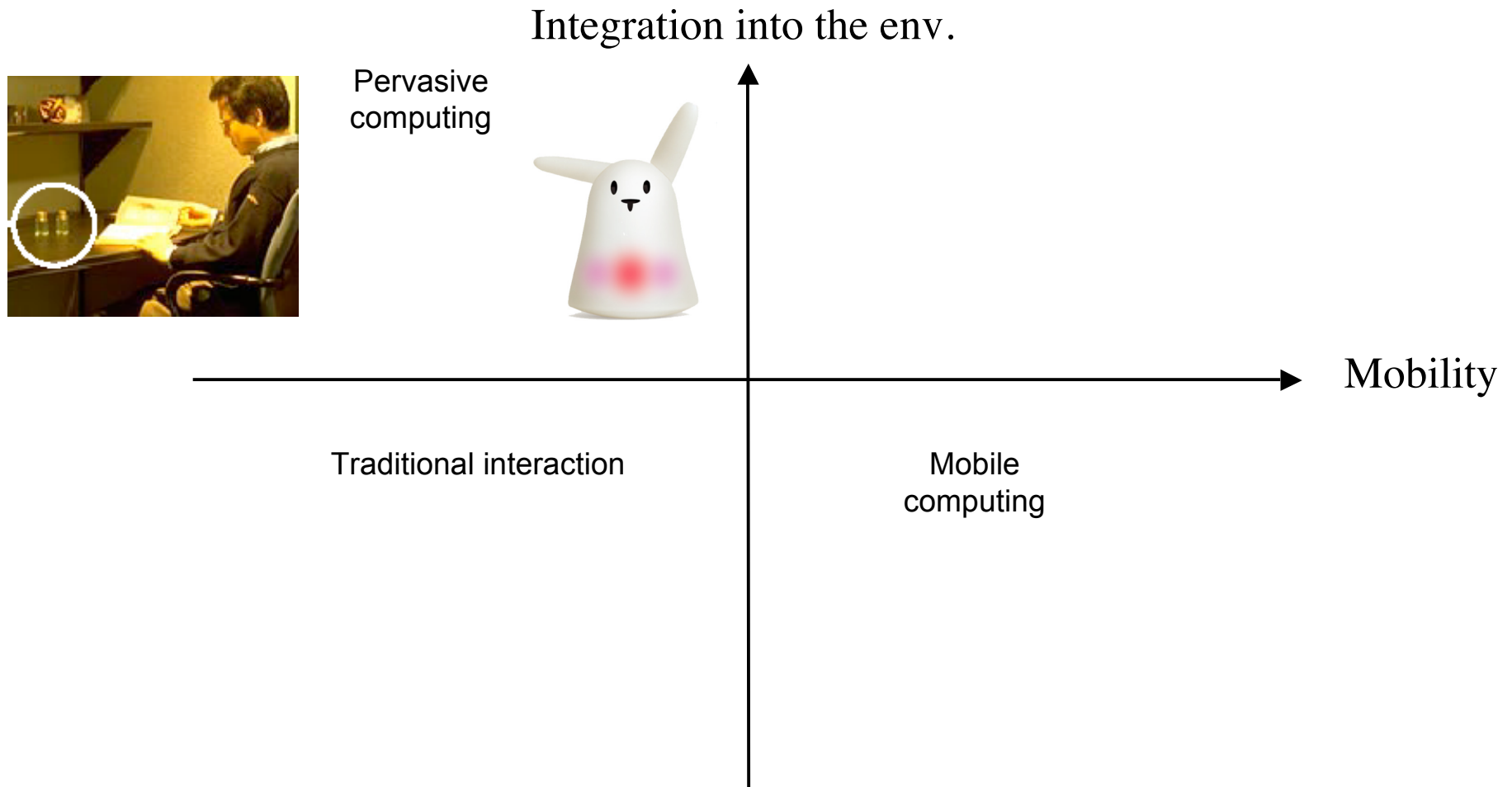
[Lyytinen & Yoo 2002]



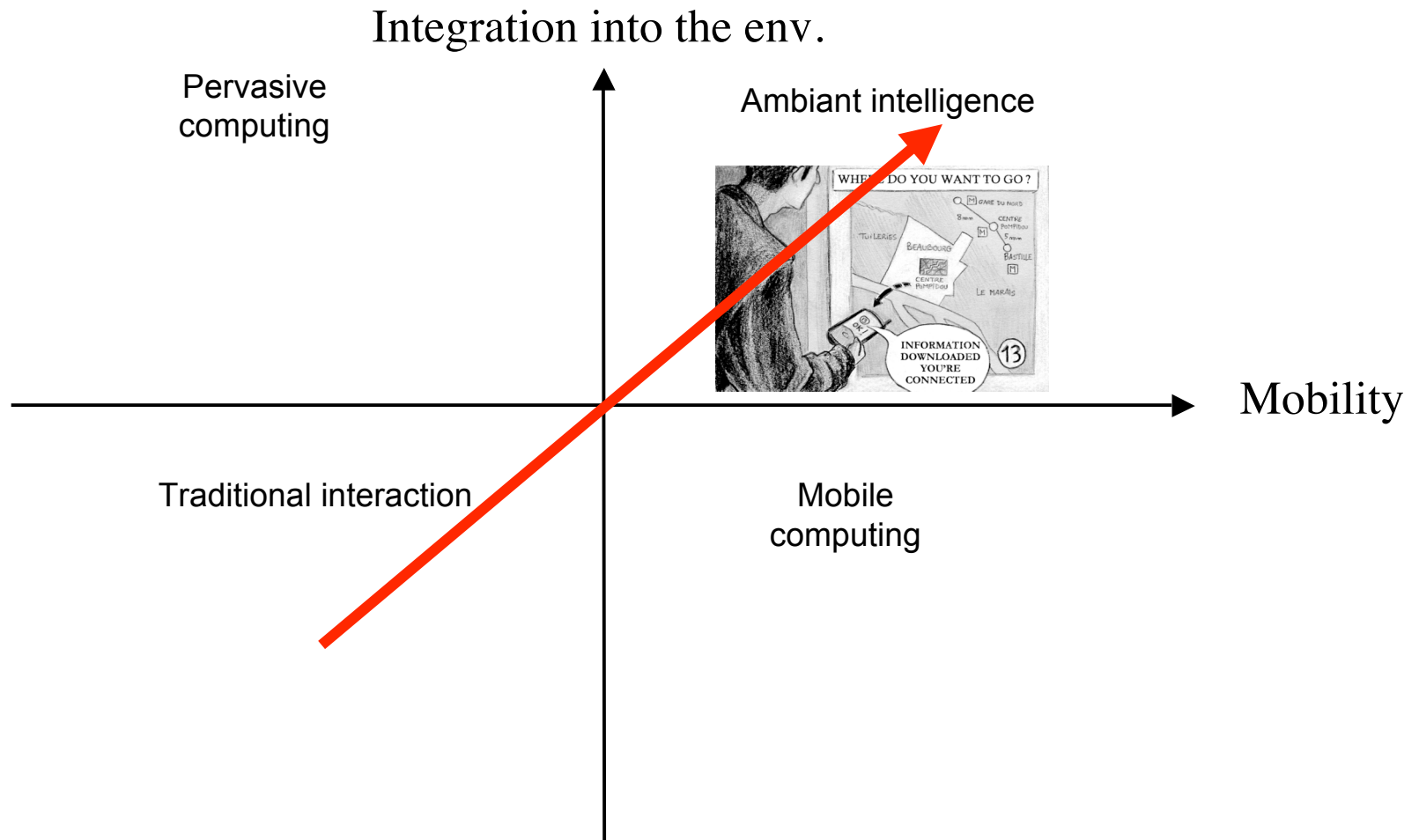


Chapter 1: From WIMP to Post-WIMP

[Lyytinen & Yoo 2002]



[Lyytinen & Yoo 2002]





Chapter 1: From WIMP to Post-WIMP

■ Mark Weiser: the vision

- "The most profound technologies are those that disappear. They weave themselves into the fabric of our everyday life until they are undistinguishable from it... Computers are pushed in the background[the] next generation computing environment in which each person is continually interacting with hundreds of nearby wirelessly connected computers. The point is to achieve the most effective kind of technology, that which is essentially invisible to the user ... I call this future world Ubiquitous Computing".
- Several terms
 - Ubiquitous computing (Mark Weiser)
 - Pervasive computing (IBM)
 - Disappearing computer (CE)
- A scenario: GLOSS

Bob lives in Brussels. He drives to the train station to take the train to Paris for a business lunch with his colleague Jane.

While in Paris, he hopes to see a bit of the city since he has never been there before.

In the afternoon, Bob will take the train back to Brussels.

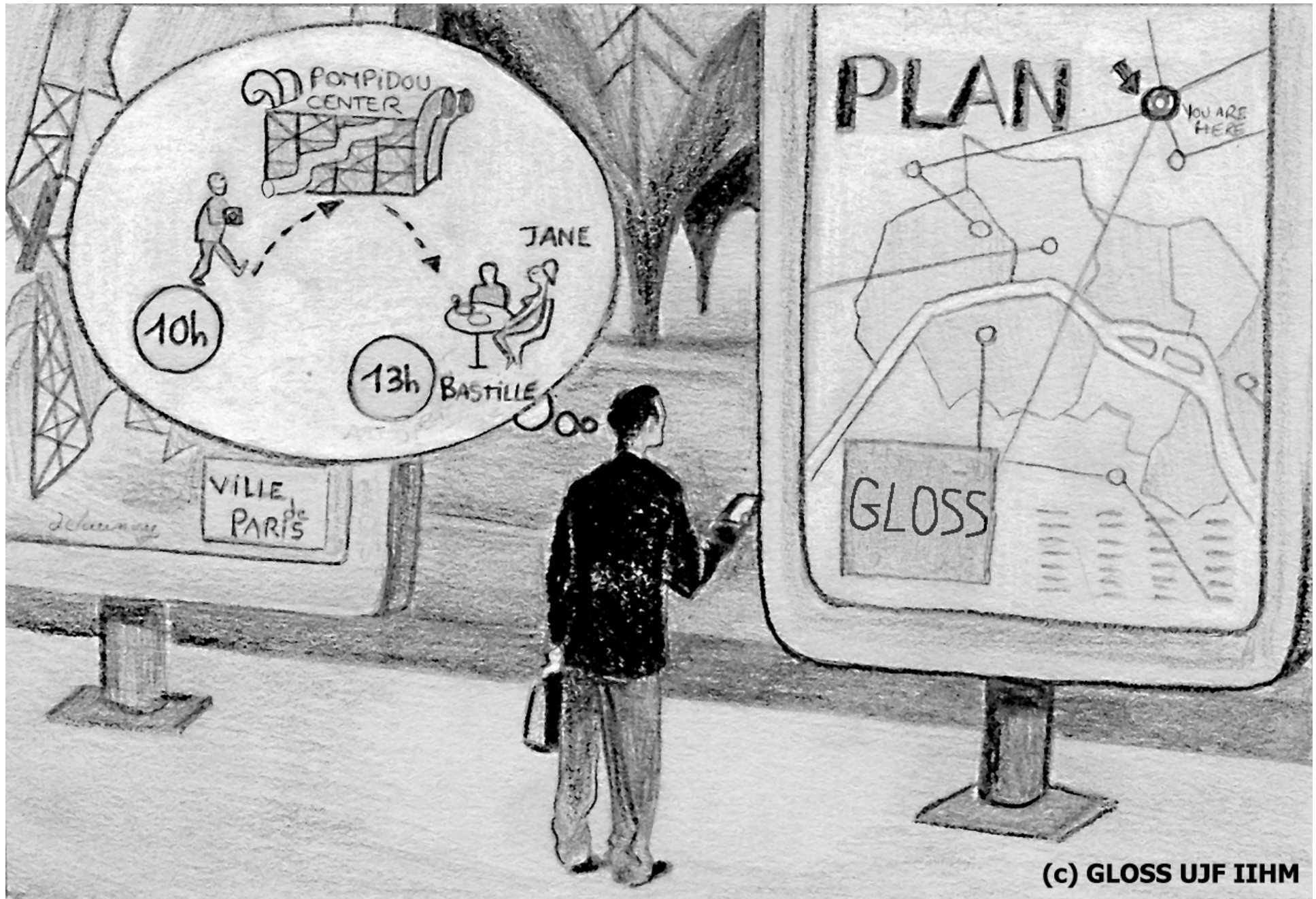


(c) GLOSS UJF IIHM

In Brussels. Bob gets directions to a free parking space outside the train station. The parking lot is activated by his arrival and connects to Bob's PDA to get his parking requirements and profile..



In Brussels train station. As Bob is walking close to an active wall, he is presented a message relevant to his trap in Paris

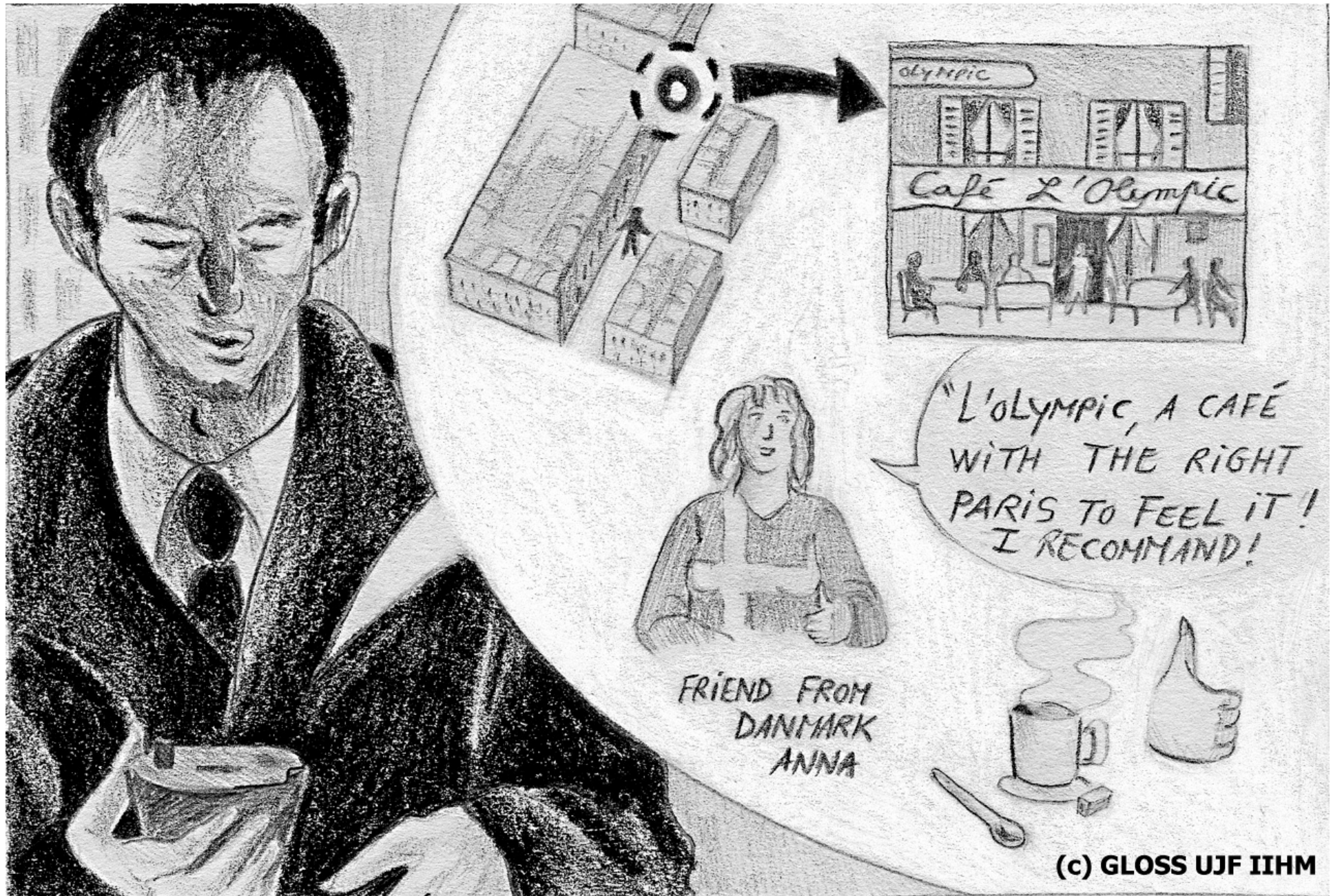


(c) GLOSS UJF IIHM

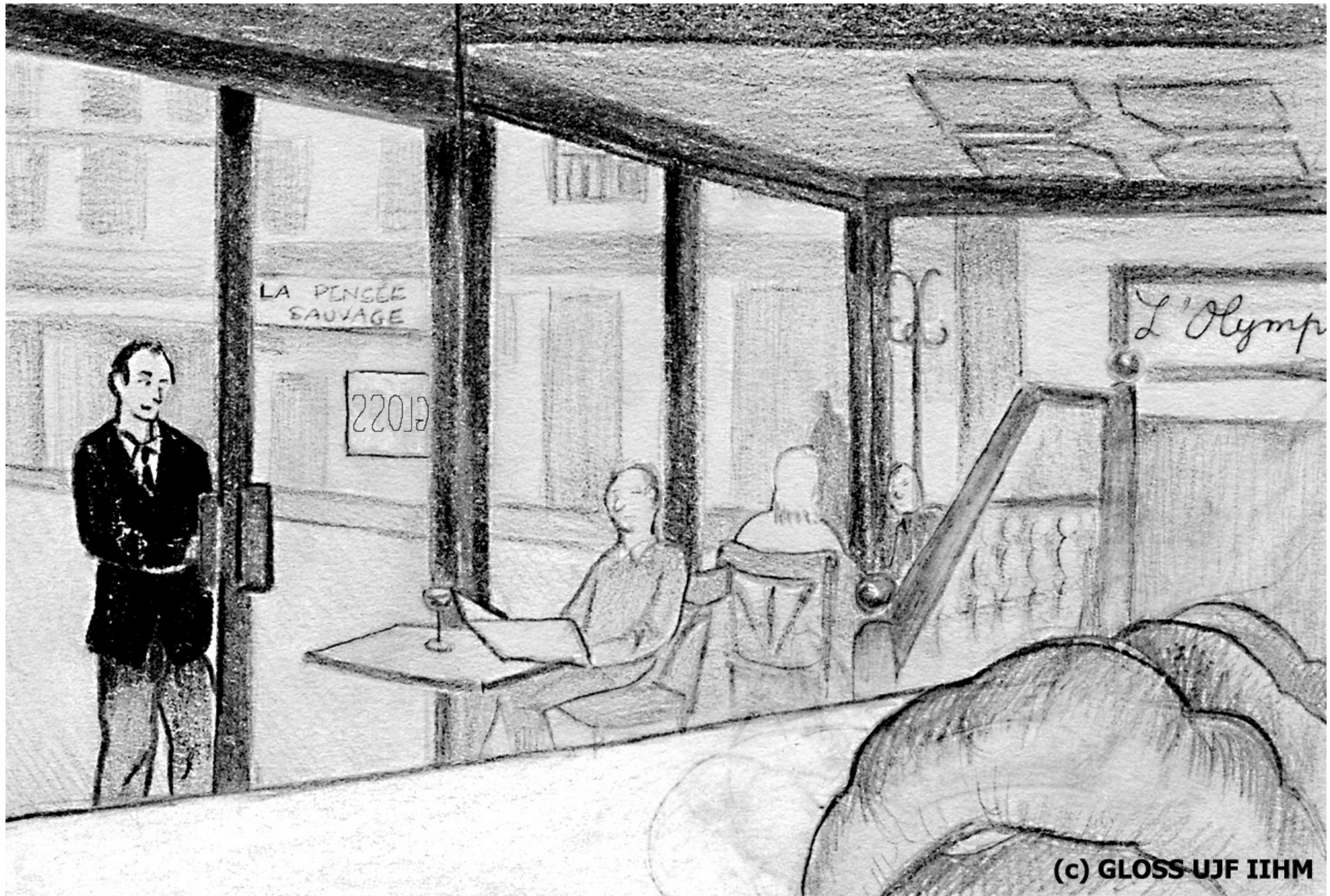
In Paris Gare du Nord. Bob tries to locate the public map that can tell him where he is. Being in Paris is a new experience for Bob.



In a street in Paris. Having the right direction Bob, starts to move towards the Pompidou Centre. After Bob has walked a block, he feels a vibration in his clothes.



Bob's PDA tells him there is a café coming up around the corner that his friend in Denmark recommended last time he saw her.



(c) GLOSS UJF IIHM

Bob doesn't want to miss this. So he turns off the trail to the right at the next crossing. It's time for a coffee anyway and Bob sees that they have freshly baked croissants.

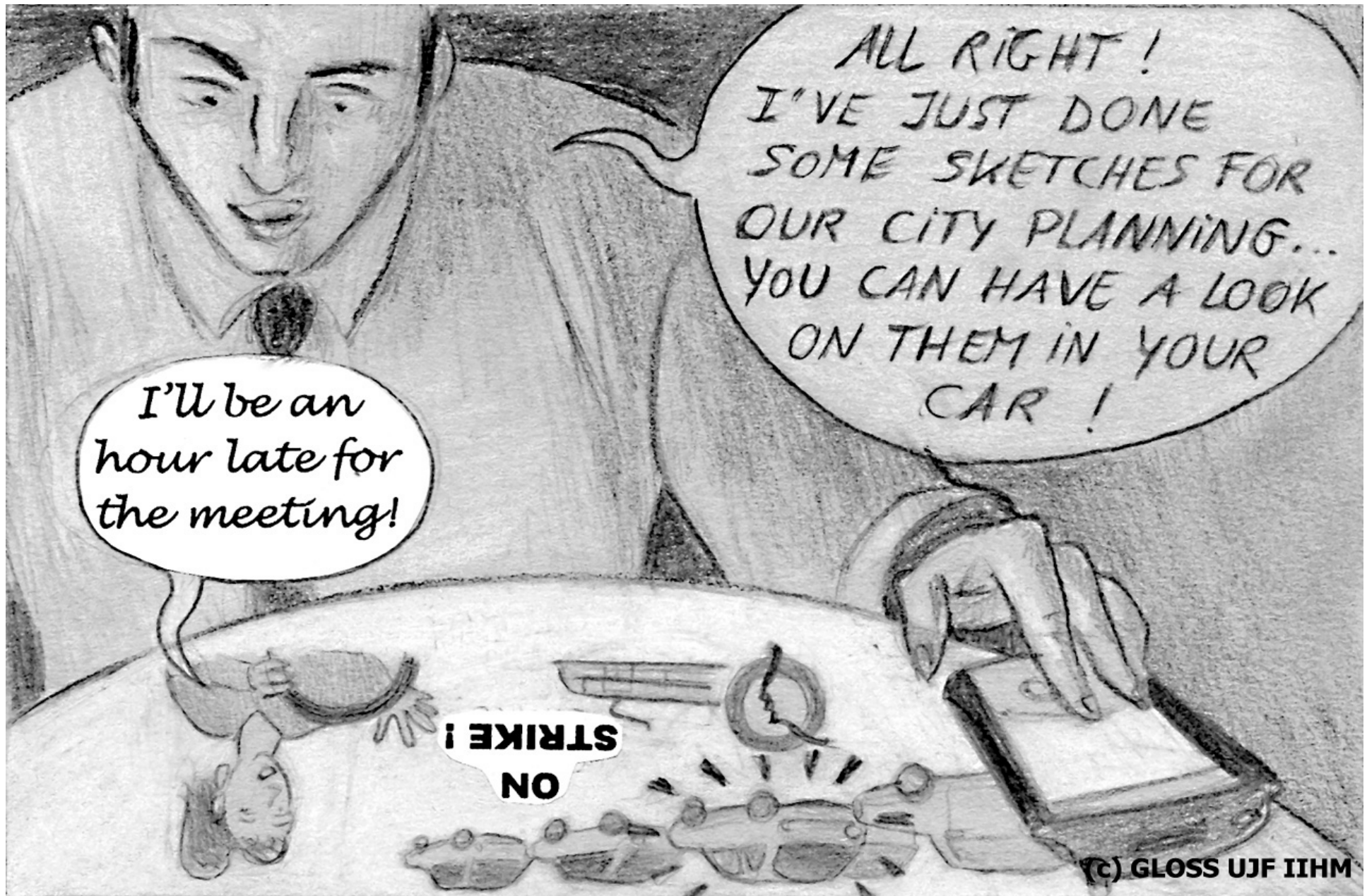


(c) GLOSS UJF IIHM

In the Olympic café, using an augmented table. Bob's profile knows that he is very much interested in being informed as much as possible about Paris.



Bob has coffee and is sitting, scribbling on the table. He accesses the picture bank of the café and sends a postcard to his Danish friend. Bob receives a message from



Jane is stuck in traffic and her PDA estimates that she is going to be an hour late for the meeting (the metro system is on strikes). Bob tells her that he has just done some sketches of some ideas for their city planning. She can have a look at them in the car before she comes to the meeting.



(c) GLOSS UJF IIHM

In Paris, by the end of the afternoon: Bob goes to an exhibition.



At home. After dinner, Bob displays a picture of Giacometti's sculptures on one of his interactive walls. The picture is one of the five that Bob downloaded at the Pompidou Centre.



Exercice 3

- Please envision an ambient university ...