

Embodiment as Professional Knowledge

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Abstract

This paper describes some of the results of a research project that studied the design practices of technological systems in an Internet company. The company manages a portal that provides services to a mass audience (personalized homepage, news, e-mail, SMS, thematic channels, e-commerce, etc.). The company employs 40 people, who are divided in two main work groups: producers and engineers. The former manage the editorial content while the latter manage the portal's systems and applications. The research was conducted using an ethnographic method supported by tools of conversational analysis.

Results show that designers rely on professional practices that integrate resources in different semiotic fields (discourse, body, structures of the material environment), each playing a specific, contingent role. The paper provides prototypical examples of these practices and, more particularly it examines the specific role played by the body in the organization of the collective design action.

Key-words: *design practices, work groups, technological mediation, distributed cognition.*

1. Introduction

This short paper describes some of the results of a research project that studied the design practices of technological systems in an Internet company. The research takes place within the perspective of workplaces studies (Luff, Hindmarsh & Heath, 2000) whose main objective is the analysis of social and interactional aspects of work activity systems, with particular attention paid to the role played by technology.

In the "highly technological" work setting in which this research project was conducted, technology acts as both the instrument of mediation which supports the shared realization of work practices and as the "product" of that work activity.

In this paper we will analyze how designers progressively and jointly build such products, and, in particular, how specific design activities are socially organized in this company. We will focus on relevant design activities such as: 1) participating in teamwork; 2) interacting; 3) imagining absent objects; 4) designing actions; 5) embodying "future" interactions in technological products.

2. Enter the setting

The data that we are going to analyze come from a research project on work practices in an Internet company (Zuccheromaglio & Alby, 2005). The company (which we will call “Energy”) manages a portal that provides services to a mass audience (personalized homepage, news, e-mail, SMS, thematic channels, e-commerce, etc.). It employs about 40 people, who are divided into two main work groups, i.e., producers and engineers. The former manage the editorial content and the latter the portal systems and applications.

The data were collected over a three month period, through field observations, video recordings, and interviews. In the first month we realized a preliminary field observation aimed to describe the everyday organization of the work place and practices. Selected interviews with key informants were also realized in this phase. In the following months we recorded about 10 hours of video portraying interactions, which were transcribed using the Jefferson notation system (Jefferson, 1989). In order to have a broader view of the work practices under study, we also collected instant messenger logs (about 3 hours), e-mail (related to the interactions, 23 items), papers (related to the interactions, 10 items), photos (20 items), print screens of the web site and various applications (10 items). The analysis of the entire data corpus enabled us to describe the specific organizational features of Energy. The conversation analysis of discursive and interactive data let us study the situated and emergent organization of social action.

3. Embodiment at work

3.1. Participating in teamwork

In this setting technology is both the product of work and the mean that mediates activities. This mediation creates a particular spatial configuration of work groups. Actors take particular postures around the computer in order to get closer to the artifact, and to see and participate in the ongoing activities.

Fragment 1

1. Participating in teamwork

- “Seeing” a work group



In the office/open space this is a visible sign that there is a group at work. It also illustrates the kind of work they are doing.

Changes in this spatial configuration correspond to changes in participation in teamwork. For instance, when a designer moves away from the screen this shows his intention to leave the group, as we see when Luca raises from the rest of the group whose focus is “projected” on the computer and leaves 8 seconds later (see Fragment 2).

Fragment 2

1. Participating in teamwork

- Leaving a group



3.2. Interacting

We observed that, when the activity is mediated by the computer, which very often is the case, interactions are dialogues in which actors ‘give voice’ to what is going on

inside the machine, making visible the ongoing activity to other participants (Suchman, 2002).

The trialogue is not necessarily performed through discourse, but it is realized through different semiotic resources, as we see when the interface through which Paolo is working takes a good 20 seconds to elaborate the operation (see Fragment 3).

Fragment 3

2. Interacting

- “Trialing” (Suchman, 2002)



In this 20 sec of silence (which would be very strange in a setting without technology), we see that the interaction is mainly organized around the computer, as if it was a true third conversational partner.

The interruption is made visible to the rest of the public present by a sequence of three gestures performed by Paolo (and used by Luca as a sign that he can take a break). He drums his fingers on the desk, knocks on the desk and then crosses his arms.

Here we see that the action is organized through *sociomaterial arrangements* of both designers and technology (in this case a configuration of body and interface). The trialing also supports a process of *interpretation of the function of technology*, which is a central point in the design activity. Very often designers have to reconstruct what the machine is doing because this process is hidden from them (see Fragment 4).

Fragment 4

Trialing

- Making visible “hidden” actions

Teo (eng)

(configuration: talk, body, computer, space)



Teo: così ti puoi
lavorare da dentro

Teo: like this you
can work on it from
inside

poi vai lì e
converti

then you go there
and you convert
(them)

e li metti da
un'altra parte

and you put them
somewhere else

In this interaction Teo explains the functioning of a macro that he built to a colleague. In the first frame the hand pointed at the screen represents the action of ‘work from inside’, as if through this gesture they could go inside the program. In the second photo ‘then you go there’ means inside the macro, the gesture of moving the hand back and forth represents the conversion of contents that the designer makes through the macro. Then Teo ends the gesture moving the hand away from the screen as if he was moving the converted contents somewhere else.

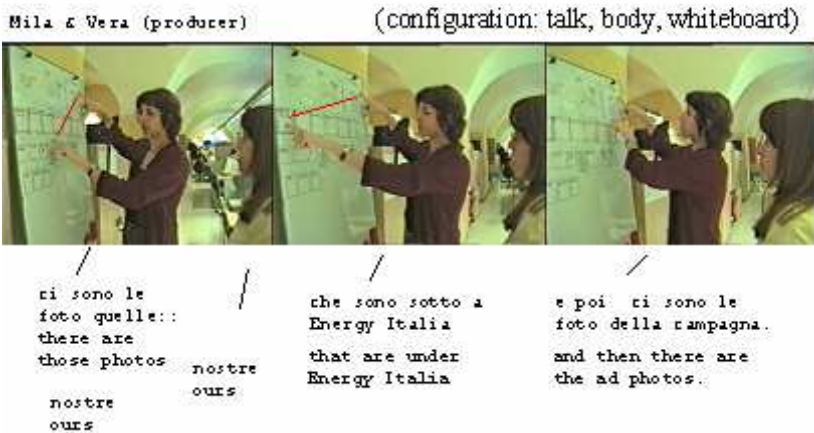
Teo could easily show the macro using the computer in front of him, but instead he prefers to represent it through this performance. This is because at the computer they could only see the lines of code that Teo would write on the interface and then the results of his action, the contents converted. But they couldn’t see what happens in between, because the process is hidden from them

A key point is that these sociomaterial practices are able to represent *technology in action*, in use. In representing the action, the body plays a fundamental role, as we see in this other interaction, in which two producers are designing a web page (see Fragment 5).

Fragment 5

Trialing

- Animating representations



The arms work as links among the pages. The right arm is on the homepage and the left arm traces the links with the pages, representing the possibility of movement that a user would have. We see how the producer's body has a fundamental role in animating this representation, in making it dynamic.

3.3. Imagining absent objects

In some of the examples we've seen designers interacting with programs that exist, that are there in front of them; but designers also have to build the technological apparatus themselves. The technology is absent in the initial steps of the process, because is what they are going to create. In this case design is a joint imagination process which gradually shapes the technology it creates.

In this type of work the spatial configuration of the group is different: designers are not projected into the artefact but they are in circles, so that they can see each other. One reason is that the body is symbolically used to materialize, to create in physical space, what is being imagined by the interactants (see fragment 6).

Fragment 6

3. Imagining absent objects



This is a fragment of a meeting of the engineers, in which they are designing a kind of program called feed. This program has to import data from external machines in order to 'feed' them to the website. Actually more than just import the data, the program makes a copy of them and then cancel the original.

Here we see the engineer Teo embodying the feed program. He opens his arms to represent the feeds that get the data from outside, and then closes the arms to indicate the arrival of the data at its destination. In the third frame he makes a circular gesture to show what happens if the program doesn't clear the original copy from the machine, which means that the same data are imported again and again, and are spread all over the system.

Through this sociomaterial configuration composed of speech, body and space, Teo makes visible to his colleagues the functioning of a program which doesn't exist because they have yet to build it.

The kind of imagination used is what has been called "imagining in the hypothetical mode" (Murphy, 2004): seeing things as if they were something else (Teo's body as if it were the program).

Being in a group is fundamental in this process of imagining absent objects, for many reasons: for one thing designers think and progressively shape the object together, using knowledge that is distributed among all the members; for another, at that moment there is no way to know if the feeds will really work if designed in this way (because they don't exist yet). So the choice, the hypothesis that 'wins', is the one that convinces the others, the one which passes this interactive test. This is why the designers look at each other and not just at the drawings on the paper, which they also use, but not in such an exclusive way as in other kind of activities. And yet another important reason for being in a group is to plan and coordinate action.

3.4. Designing actions

In general, designers don't talk about their actions, and how these are related to technology. The actions at this level are tacitly shared, and are shadowed by the talk of technology. It is only when the relationship between technology and designers becomes unclear that they emerge (see also Alby & Zucchermaglio, 2006).

Fragment 7



Paolo: yes=h: it has no effect on how many characters you can put it's just that this is inconvenient



if you have to fill a

Luca: ah: (I) got it-got it-got it.

We see that at a certain point (frame 3, fragment 7), the discourse between the designers changes: they stop speaking descriptively about the text trailer to be constructed and start talking in terms of the actions required of the designer when he will use it (which also becomes the subject of the sentence: “it has no effect on how many characters *you can put in*, only that this is inconvenient if *you have to fill a*”).

While designing technology, designers also anticipate the way it will act on them.

3.5. Embodying future interactions

Designers embody their relationship with the technology and the relationship of technology with its users. One way they do that is by speaking as the user. We see in the following fragment in which Vera and Mila are designing a webpage. It can be noticed that Vera becomes the user.

Fragment 8

Configuring technologies and users



```
Vera: quando uno non sa  
più dove cliccare va  
nella mappa  
when someone doesn't  
know where to click goes  
into the map  
  
Mila: ecco  
right
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One of the interesting features of this interaction is the way in which a non present actor (the user) is made relevant to the ongoing action. One of the members of the group becomes the absent party, and in this way the user can participate in the ongoing action (see also Zemel et al. 2005). Speaking as the user serves to constitute both the future agency (what the user will do) and the current agency (what is currently relevant for the design).

The reasons why designers are so effective in being users is that they *are* expert users, of their own as well as of others' applications.

4. Sociomaterial practices

The main findings discussed in the paper can be summarized as follows:

- The object of work (both when it is technologically mediated and when technology is absent) shapes work practices in specific ways (interaction, participation, interpretation/trialoging, imagination).
- In particular, work practices are shaped by the *absence* of the “object” or by the *invisibility of its functioning* (as in other and similar professions: Ochs et al. 1996; Newman 1998; Murphy, 2004; Alac & Hutchins 2004).
- Practices are organized through various *sociomaterial arrangements* of designers and technologies (talk, body, computer, whiteboard, space...).
- Such configurations are represented by both the way in which design develops and its product: in fact designers embody the programs they build, their relationship to them, and the program's future relationship with the users.

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