

A semiotic communication model for interface design

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ABSTRACT

This research wants to contribute to the creation of a semiotic framework for interface design. Using the Jakobson's communication model to analyse the HCI approach to interface development, we explain how some central factors of communication are not enough considered by designers.

Keywords

Communication science, human-computer interaction, interface design, semiotics.

1. INTRODUCTION

One of the basic assumptions of semiotics is that we cannot "not communicate" [24]. We always communicate even when we are not consciously sending a message. Semiotics underline that everything in the world communicates (from clouds to humans): *semiosis* is a pervasive phenomenon, but there is a difference between the clouds act of producing signs and the human act of communicating. In a simple *semiosis* the sender isn't well defined (clouds aren't conscious *adressers*), in the communication process the sender has a central role.

Our first question is what kind of communication is the computer's communication. It isn't a simple *semiosis*, but we must observe it's a special kind of communication, which, in some way, is more similar to advertising communication than human-human interaction. Using the Jakobson communication model, we observe how some communication factors and functions aren't well applied in the human-computer interface design and we suppose this fact may be a cause of some interface failure of effectiveness.

2. THE JAKOBSON MODEL AND THE HUMAN-COMPUTER INTERACTION

Ronald Jakobson proposed this model, taken from Weaver and Shannon cybernetic research, for his studies on poetic language [9]. Jakobson identified three basic factors (sender, receiver, message) and three other factors (context, medium, code). Each

factor has a communication function and Jakobson noticed that the meaning of a message can be produced by the weight of just one function, but any of them can be excluded.

We think that three communication functions/factors should be better studied in HCI: the *sender*, the *code* and the *context*. Before discussing these three factors, let's make some considerations on the others. We said we can't "not communicate", but there isn't any communication without a receiver and the meaning of a message is defined by the receiver's interpretation. Therefore the receiver has a central role. HCI studied deeply the receiver, in a non-semiotic approach, with the user-centred design theory, the cognitive studies on human understanding, etc.

User observation, user modelling, collaborative design, etc., are methods for knowing the user and developing his interface in an effective way. We think, however, that also semiotic studies on the *reader* can have an heuristic function in HCI research field. We think of Umberto Eco *reader model*, his theories on *intentio auctoris*, *intentio operas* and *intentio lectoris* (the reader's interpretation based on his sign system, desires, emotions, beliefs, etc) [5]. The science of rethoric, literature and semiotics developed many methods and strategies "to guide" the reader interpretation. These strategies are ignored by computer science and most of cognitive studies, but we think they could be useful to improve human-computer interaction and they should be studied more deeply (metaphor generation is the only method that has been developed in this perspective [7]).

The medium is another central factor of the communication process. It's often said that the interface is the medium, but the medium is a very complex entity, especially in CMC [10] [18], that we should study separately.

2.1 The Sender

Semiotic HCI defines interfaces as messages sent by the designers to the users [4]. Can we really say the designer is the sender? Do users think the designer is the sender of the messages they receive during their computer sessions? If the answer is no, why we should use this model?

Do we have a real sender in this communication (if we think of a conscious sender)? Can we say the computer is the sender? Do users think about the computer as a real sender? The interface system is a world of signs in which we operate and manipulate, but sometimes computer also "speaks" to us. We think the user difficulty to understand the system resides in this second situation. Winograd and Flores [25] showed us how humans apply social rules in their relations with computers and how humans usually think of the computer as a conscious entity. The point is

that we should better clarify to the user, through the interface, the characteristics of this special sender (the computer) in order to avoid interaction problems derived from the misunderstanding of the sender's function. The aim of our research is to better understand how the user's conception of the sender influences the meaning interpretation.

2.2 The Code

The code is necessary for communication. Do we know codes from birth? No, we have to learn codes: from the meaning of clouds to the meaning of a sentence. Also the iconicity of the visual signs needs a learning phase to be understood. Think of the desktop icons: in semiotics this term describes a particular kind of sign which has the signifier similar to the content (see Peirce's theory on the three forms of sign representation: iconic, indexical, symbolic [16]), in interface design icons are similar to the object they represent, but we need a phase of learning to understand this codification. HCI aims to create systems we can use without learning, but we think this approach is too radical. We are able to learn, so why completely avoid this process?

Ease of use must be viewed as ease of learn. Creating systems with analogies to things we already know is a good way to reach this objective (desktop metaphor, infodomatics) [15], the creation of code conventions is a way to support understanding (the Web is adopting many conventions like "lens" for "search"). We have to continue working on codes, knowing that from a semiotic point of view the communication process is enabled by a previous knowledge of the code by the receiver. The science of rhetoric and linguistics can help HCI to create simple interface languages.

2.3 The context

The context has the power to change the meaning of a message (if you say "it's cold" and you are on the train and the window is open, you mean "close the window"; if you say the same sentence and you are in the mountains you just mean the weather is cold). The context is so important that Jakobson use this term to indicate the content. In interface design the context is the user's world, culture, job, computer knowledge, etc., but it's also the user's conception and understanding of the digital environment in which he operates. For this reason we should create coherent contexts in computer systems (the numerous studies on consistency in interfaces underline this need), but the problem is that the context change during, and in consequence of, a conversation\interaction. How can we build such dynamic contexts in a computer system?

The context has been studied in scenario-based design [12] and participatory design at the interface development level, but the concept of context should be studied more deeply. There are some very interesting approaches [11], [22], [25], [8] and, between them, we think Laurel's theories of user engagement and *interface as mimesis* are examples of a deeper insight. The field of computer game development should be considered too. [3].

3. CONCLUSIONS

HCI has focused his attention on the *medium* and on the *receiver*, but there are some factors in the communication process that are even more important: the *sender*, the *code* and the *context*. This paper refers to a research project that will study the effects of

these three factors on human-computer interaction, and puts in evidence some questions that HCI and semiotics should reflect on.

4. REFERENCES

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