UŽIVATELSKÉ ROZHRANÍ JAKO PROJEV POLITICKÉ IDEOLOGIE

User-Interface as an Expression of Political Ideology

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Abstrakt: Uživatelské rozhraní interaktivních systémů je místem setkání člověka s interaktivními komunikačními technologiemi (ICT). Jakožto lidský výtvor jsou tyto technologie součástí kultury, která nás determinuje, často aniž si to plně uvědomujeme. Uživatelské rozhraní je sestaveno na základě souboru hodnot tvůrce a ostatních účastníků procesu produkce. Jejich hodnoty a cíle jsou pak implicitně zakódovány v uživatelském rozhraní i v jeho dokumentaci. Tyto hodnoty však mohou být v konfliktu s hodnotami uživatele. Uživatelské rozhraní, které směruje uživatelskou interakci k naplnění záměru uživatele je však více podmíněno záměrem tvůrce, nebo jednoduše tím, co daný systém sám o sobě umožňuje. V tomto okamžiku nastává záměrná i nezáměrná manipulace s uživatelem, kterému jsou předkládány nevhodné volby nebo dokonce nevhodné cíle. Cílem tohoto článku je tudíž ukázat, jak takováto manipulace funguje, v jakých ohledech je nevyhnutelná, ale jak se jí můžeme pokusit vyhnout. Navrhujeme zvláštní druh výzkumné metodologie založené na sémiotice, která by uměla extrahovat tvůrcovu interpretaci potřeb uživatele, podle kterých rozhraní navrhuje. Díky tomu bychom mohli lépe celý problém manipulace analyzovat za účelem vytvoření lepšího uživatelského prožitku i napříč odlišnými kulturami.

Klíčová slova: Uživatelské rozhraní, ideologie, hodnoty, etika, manipulace, persuaze, rétorika.

Abstract: The user interface of interactive systems is the meeting point of people with interactive communication technology (ICT). As a human product it forms a part of culture that determines us, often without our full realisation. The interface is constructed according to a set of values of the designer and other stakeholders in the production process. Their values and goals are implicitly encoded in the interface and the documentation but can be in conflict with the values of the user. This means the interface directs the user interaction in a way that should follow the user's intentions, but is often more subject to the intent of the designer or simply by what the system allows for by itself. This is when both the intentional and unintentional manipulation with the user starts, because she is presented with inappropriate choices or even inappropriate goals. The goal of this article is therefore to show how this manipulation works, in which regards it is unavoidable and how can we try to avoid it. Ideologies are a special means of manipulation. Using rhetorics ideologies lead to building interfaces answering ideological goals. A mere scientific analysis is bound in a subject-object relation towards the interface, thus inhibiting us to get a proper reflection. We are therefore going to look at the topic of this paper by using the context of post-modern philosophy.

Key words: User-interface, ideology, values, ethics, manipulation, persuasion, rhetorics.

1   Introduction

The user interface of interactive systems is the meeting point of people with interactive communication technology (ICT). As a human product it forms a part of culture that determines us, often without our full realization. The user-interface (UI) is constructed according to a set of values of the designer and other stakeholders in the production process. Their values and goals are implicitly encoded in the interface and the documentation but can be in conflict with the values of the user. This means the UI directs the user interaction in a way that should follow user's intentions, but is often more subject to the intent of the designer or simply by what the system allows for by itself. This is when both the intentional and unintentional manipulation with the user starts, because he or she is presented with choices or even goals, that are inappropriate for his or her intent. For the purpose of unmasking and decoding the inner workings of the UI we can apply semiotics with the emphasis on pragmatics, as defined by Charles Morris (1970). Semiotics is in this regard a study of semiosis, which has a syntactic, semantic and pragmatic dimension.

Syntactics is "the study of the syntactical relations of signs to one another in abstraction from the relations of signs to objects or to interpreters…" (Morris, 1970: 13) In this dimension we deal with the grammar constituting relations between the perceivable elements, or sign vehicles.

Semantics, on the other hand, "deals with the relation of signs to their designata and so to the objects which they may or do denote." (Morris, 1970: 21) This dimension is devoted to the relation between vehiculae and the object, content, action, or "meaning" the UI represents and enables.

Pragmatics "deals with the biotic aspects of semiosis, that is, with all the psychological, biological, and sociological phenomena which occur in the functioning of signs." (Morris, 1970: 30). This most complex dimension focuses on how we use or interpret the vehicula-object relation, i.e., what is the sign's purpose? The pragmatic dimension governs how signs are used, or understood in their conventional and symbolic form.

Each and every computer-based UI is a result of diverse influences during the design process. Stakeholders have their own goals and expectations that he or she tries to put into the final product. For example, the sales and marketing department could have a goal of a short time-to-market time, easy adoption of the product from the users, and gimmicks strengthening the brand and the product family. The programmers might want to incorporate an advanced and well-tested technology, while the designers would want to create a simple and good-looking interface. All of these often conflicting values can have their way into the final product at the cost of the final user, who expects the product to fill his or her needs and help achieve his or her goals. Often, such expectation falls short and the user is forced to become a "detective" trying to guess the motive of the designer/producer, in order to understand, how to use the product in a sensible way. In this light, the user should be as much aware as possible of the techniques used during the development process as well as the prevailing ideologies driving the UI production. Some even argue for a philosophy of technology:

> "...when HCI was primarily concerned with issues of usability, the question of what was a 'good design' could be defined clearly; the time it took to complete a task, the error rate, or the learning curve. (...) To understand what makes a 'good user experience', HCI will need a philosophy of technology." (Fallman, 2007:305)

Mainly to allow for this different take, we can apply semiotics methodology, or more specifically the semiotic engineering approach (de Souza, 2005). It is based upon the idea of analyzing signs (Buchler, 1955; Andersen, 1997), codes, messages and discourses that take

place in the communication between designers, computers and users. In the semiotic tradition of Peirce, a sign is anything that represents, or stands for, something in one's perspective. In the UI signs can be icons, buttons, menus, windows, pointers, etc. The semiotic engineering looks also into the meta-communication that takes place during the user interaction with the system. According to semiotic engineering the system is built according to the designer's understanding of the user's needs. Such understanding is encoded in all the parts of the UI and when the system is used, in a way it speaks for the designer's part.

2   Ideology and Images

For the ends of this article we understand ideology as

"a logically coherent system of symbols which, within a more or less sophisticated conception of history, links the cognitive and evaluative perception of one's social condition - especially its prospects for the future - to a program of collective action for the maintenance, alteration or transformation of society." (Mullins, 1972)

This definition sets the basic frame of our work. What criterias should we then use to recognize and analyze further ideologies? Again, according to Mullins, these components are: cognitive power, evaluative power, action-orientation, and logical coherence. (Ibid.). By (1) cognitive power he means the "cognition and retention of information" (Ibid.), when we identify and symbolize our recurrent experience. After having done this cognitive process we can simplify, order and abstract it for making choices between information, e.g. on different causal forces. The (2) evaluative power is then based on this understanding of information. The political ideology "incorporates evaluations of what is conceived" and can anticipate "possible events and conditions." (Ibid.) The (3) action-orientation is based on the power of the ideology to "communicate conditions, evaluations, ideals, and purposes among members of groups (...) and thereby facilitates the mobilization and direction of energies and resources for common political undertakings." (Ibid.) Finally, the (4) logical coherence or consistency between various ideology components means, "the ideology must 'make sense' and not result in logical absurdities." (Ibid.)

As the word suggests, ideology is related to ideas. On this level it is needed to work with the relation between UI and image. As Mitchell put it,

"The concept of ideology is grounded, as the word suggests, in the notion of mental entities or 'ideas' that provide the materials for thought. Insofar as these ideas are understood as images - as pictorial, graphic signs imprinted or projected on the medium of consciousness - then ideology, the science of ideas, is really an iconology, a theory of imagery." (Mitchell, 1986)

 "Ideology, then, which begins historically as an iconoclastic 'science of ideas' designed to overturn 'idols of the mind', winds up being characterized as itself a new form of idolatry - ideolatry." (Ibid.) Thus, it is important to analyze the visual plane, (together with metaphors, mental models, navigation, interaction)[1] of UIs, where ideologies take the most recognizable shape.

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[1] cf. Marcus, A. "Integrated information systems: A professional field for information designers". *Information Design Journal* 17:1, 4–21. 2009.

Nowadays, in the context of ICT, ideology comes to us from a rather unexpected direction. As Galloway (2009) points out citing Althusser, ideology, "traditionally defined as an 'imaginary relationship to real conditions' (Althusser)" (Galloway, 2009: 953), has been superseded by simulation. He understands simulation as an "'imaginary relationship to ideological conditions'. In short, ideology gets modeled in software." (Ibid.) Therefore, software makes the prime example of current ideologies acting on us according to all the four criteria mentioned.

3 Software as Ideology

Software models ideology, makes it visible through the way software works. It does so by relating to the underlying hardware in a specific way:

> "In a formal sense computers understood as comprising software and hardware are ideology machines. They fulfill almost every formal definition of ideology we have (...). Software, or perhaps more precisely operating systems, offer us an imaginary relationship to our hardware: they do not represent transistors but rather desktops and recycling bins." (Chun, 2004:43)[2]

Most importantly, as Chun continues, "Software produces 'users'." (Chun, 2004:43) Software creates both a relation with hardware, as well as with users. Hardware is what the user encounters first, although the focus is then shifted to the software, and the UI as a whole.

UI is regarded as an entrance into a simulated world, but UI is also forming a media layer between the "real" world and the user. "The doorway/window/threshold definition is so prevalent today that interfaces are often taken to be synonymous with media themselves." (Galloway, 2009:936) An even more poignant definition relates the UI more tightly to the effect it has on the interacting users:

> "The interface is this state of 'being on the boundary.' It is that moment where one significant material is understood as distinct from another significant material. In other words, an interface is not a thing, an interface is always an effect. It is always a process or a translation." (Galloway, 2009:939)

The UI works thus not only on a semiotic level by differentiating symbols, but also on a psychological level, when it creates relations and effects. For the UI to be effective (and user-friendly), it is important to work "as a 'mirror' depicting the user's self-image, not only a 'window' looking into a world of content(...)." (Marcus, 1998:53)

The differentiation work of the UI done between the user and user's self-image (as well as the UI and its content, or the represented content and the original) leads us to think about the UI in the terms of an active self-organizing entity. This notion is close to what Derrida (1993) called *differänce*. Following Derrida's argumentation, the UI presents a different idea from the original one (or content) just by the way it is mediated. Thus, different media can go only as far as their structure permits. The medium of text can express other things than speech (e.g. Derrida's example of difference vs. differänce, both of which are read the same), the medium

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[2] cf. Galloway, 2009:953 - "The computer is the ultimate ethical machine. It has no actual relation with ideology in any proper sense of the term, only a virtual one."

of image can express other things than text, aso. The medium of the UI thus expresses its content differently.

The primacy of text for Derrida is something we can also see very well in software. In software one can go past the interacting subject, because the machine can follow its own rules made up by the program. This is in contrast with the UI, which is bound in the subject–object relation (Heidegger, 2004; Derrida, 1993) simply because it requires a user. By installing the user into the interaction, we form a center (of action), and a periphery (lemma). Because the action is done at (and through) the UI, the UI priviledges the content it presents[3]. This way the UI not only tells us, how to read a certain idea (or information), but can also pre-select for us which ideas we can possibly read. In this sense we speak about the ideology of the UI, or relation between the UI and the presented ideas.

4　　User-interaction and Ideology

Each UI presupposes a certain context of use (a paradigm), which is not always visualized. When built correctly, the UI lets us see just what has to be seen. the UI itself (as construct on top of the paradigm, a syntagm) stands on a certain ideology. It defines relations, which are to be made. To what extent are these relations social (and guide the tradition and further evolution), to that extent UIs are political, and ideological.

While the prevalent UI definition is connected with a gateway, a passage into another world, beyond the entrance the world is structured according to another paradigm. As Frasca (2004) states, "The 'interactive drama/storytelling/narrative' paradigm has been the leading design guide (...)." (Frasca, 2004:85) From the narrative perspective we can gain a better insight into the UI structure and the underlying intent.

> "In temporal terms, narrative is about what already happened while simulation is about what could happen. Because of its static essence, narrative has been used by our culture to make statements. (...) The potential of simulation is not as a conveyor of values, but as a way to explore the mechanics of dynamic systems." (Frasca, 2004:86)

By analyzing the individual statements we can follow an entire argumentation constructed with the help of the different UI elements. A simple way of doing this is transcribing the "interaction sentences" (for a detailed explanation see Brejcha and Marcus, 2009) that the user encounters while performing a certain task. The interaction sentences can be analyzed further in terms of their syntax, semantics, and pragmatics, e.g., what goals the designer has and what assumptions has about his or her users. By exploring different parts of the system through the UI we can extract the inherent (encoded) values.

We argue, that when the UI follows the structure of natural language, it both behaves user-friendlier, and conveys the designer's intent more effectively. In line with Mullins' perspective of ideological cognitive power, Winograd and Flores state, that: „Computers have an especially large scope, for they are machines that work with language. By using them we join a discourse set up in the limits made by programmers." (Winograd a Flores, 1987:178) This is very important, because the discourse the users take part in directs their interpretation of signs present in the UI. Moreover, language, as a system based on syntax rules, sets the scene for a

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[3] cf. Derrida, 1993

consistent system, a consistent image of a world. In this regard language promotes also a logic coherence.

Returning to the evaluative power, let's take the example of Google Earth, which builds up on our

> „belief that a map covers a concrete phenomenon, my 'taking for true'. The function of my map - and of all the techno-images - lies in the effort to impose on me a programmed idea of a concrete world, thus to program my cognition and evaluation of the world and all of my acting in the world." (Flusser, 1995)

Moreover, "these information are designed to program the spectators of techno-images to behave in a specific way, and this in turn serves as a feedback to the programs calculating these techno-images." (Flusser, 1995) Here, techno-images are computer-generated images in Flusser's theory.

Therefore, for building new UIs we ought to deconstruct the present ones, uncover their design/intent. This suggests also Winograd and Flores by stating, that: "design is the interaction between understanding a creation... [We therefore] need to set up a theoretical framework not to watch how the devices operate, but what they cause." (Winograd a Flores, 1987:53) This is frequently the only way to understand new UIs in a situation, when we have not a suitable interpretation key - we don't know their code. It is in a way something like reverse engineering known from computer science.

Continuing to the action-orientation level of ideology, in order to use the UI, different "languages" are present in the form of action paradigms. „Action paradigms define a set of instructions, that are available at any given moment. The paradigms offered by the system should match those the user needs, so that she's not forced to perform an action she didn't intend." (Andersen, 1997:91) There are, of course, many possible illustrations, take for example the "interaction sentence" for putting the computer to sleep in Microsoft Windows XP: Here the user has to first click on Start, then Shut Down, only now he or she is presented with the intended Sleep button. Thus, for putting the computer to sleep we have to choose from buttons (and texts) that are in conflict with our design/intent. Still, when something doesn't work as expected or doesn't work at all, we can gather interesting data out of it. When we interpret a connection between an UI sign and a proposed function, this mental connection is what forms an image of the system. "Systems work because they don't work. Non-functionality remains essential for functionality." (Galloway, 2009:931) Moreover, the above described sleep sequence cannot be regarded as user-friendly:

> "...the 'choices' operating systems offer limit the visible and the invisible, the imaginable and the unimaginable. You are not, however, aware of software's constant constriction and interpellation (also known as its 'user-friendliness'), unless you find yourself frustrated with its defaults (...)." (Chun, 2004:43)

The action-orientation of ideology works also, when the medialization (i.e. how the content is presented to the user) is not trustworthy... In such a case, however, the medialization works the other way round: it influences our design/intent according to what can be medialized. For an UI to be effective, it should be both trustworthy and familiar: "Designing for familiarity is crucial when trying to persuade people to behave in unfamiliar ways." (Wai, 2007:99)

The user (or "operator" in Flusser's terminology) actuates the computer (or the "apparatus") to use it together with their technical imagination to create something, but paradoxically one of the apparatus' functions is the user's (or "creator's") design/intent. (Flusser, 2001:24) It is so, because the apparatus is predisposed only for some type of code and program cycles. As Bogost (2007) says: "Software establishes rules of execution, tasks and actions that can and cannot be performed." (Bogost, 2007:4) Therefore for the creator's intention to be fulfilled, he or she can intend only what is doable. Only using a specific apparatus for the chosen job can fulfill the creator's intent.

"The freedom to press a button with the tip of the finger starts to show it is a programmed freedom, a choice between predefined possibilities. Therefore I choose in base of prescription." (Flusser, 2003:103) Such freedom leads to the illusion of nearly unconfined freedom, our interactions are, however, latently directed to a certain goal. This freedom leads us to take over the thinking of the new media designer. (Manovich, 2001:55)

The above-mentioned "programmed freedom" is closely connected with procedures as sequences of action. Again with Bogost (2007), "[p]rocedures are sometimes related to ideology; they can cloud our ability to see other ways of thinking (...)." (Bogost, 2007:3)

We can take the action-orientation element of ideology as a form of rhetoric. This view is further discussed in chapter 8.

5   Computer-generated Ideology

Returning to the last Mullins' element of ideology, he suggests, that ideology should be coherent, i.e. syntagmatic rather than paradigmatic, since they need to help create a seamless experience. From the perspective of internal connectedness, design fills the same function as art, technics and machines, for they manipulate and try to master the original state of things, nature. (Flusser, 2003:3-4) As Flusser (2003:4) continues: „So the design at the basis of the whole culture lies in the intention to cheat nature with technics, replace the natural with the artificial..."

As we implied above, UIs are intersubjective media. Winograd and Flores (1987:169) support this by saying, that "by producing tools we design new conversations and new relations."

Therefore, the things for use mediate human relationships. And on this level signs (i.e. elements of representation) are also created. (Schütz, 1973:148) The design thus sets forth human relations. In a lot of cases this is done with a certain goal, as it is in social web projects, such as Facebook. It must be clear, however, that in most cases this is done inadvertently. Here, the agent is no more the designer, but the system of codification and medialization, determined by technical devices, above which the creator has no power any longer.

What is important here is that the ideology perpetuates itself beyond the human reach.

> „Programmers aren't the important elements for the functioning of techno-images, but the structures of apparatuses they produce. Techno-images are imperativistic not because they are used by some ideologists to manipulate the society, but because they are a projection of such a pixel universe, that pretends to present the world pixel by

pixel. For this imperativistic, 'imperialistic' nature of techno-images not the human being, but an artificial plotter, artificial intelligence, automatism of apparatuses is in charge, and has become independent from the human." (Flusser, 1995)

In the above quote, what is imperativistic, is the constructed artificial world that forces us to take it for real. What is imperialistic, is the tendency of the producers (or even the producing automata of techno-images themselves) to colonize the semiotic space with signs (techno-images) referring to other techno-images, leaving out all the rest. Such tendency is supported by a number of ideologies embedded in the UI.

6   User-interface Ideologies

What are then the emerging ideologies present in the UI? Since its inception, the modernistic tradition of ideology orbits around five main concepts: emancipation (on the personal level, as well as on the social), individuality (liberal ideology), time/space (fear of the stranger), work (with its emphasis on productivity), and community (nationalism, unity). We shift from "heavy" and "solid", hardware-focused modernity to a "light" and "liquid", software-based modernity. (Bauman, 2000). In order to tackle this problem, a shift of analysis towards this liquid phase is needed. We argue, that software - both on the personal (user) and social (society) level - should be regarded as a driving force, a catalyst, for a certain type of behavior. What happens, when images are computer-generated, when they are "techno-images", as Flusser (2001) coined them?

In the field of UI design different instances of ideology are being presented. So far, one of the most prominent is the ideology of hypertext (Bush, 1945; Nelson, 1960; Berners-Lee, 1991) - As Nielsen states, "[hypertext] makes individual users the masters of the content and lets them access and manipulate it in any way they please." (Nielsen, 2004) This user-empowering approach is contrasted by choice-obfuscation (e.g. when navigation links are not readily visible) or even user oppression (when user choice is limited or eliminated, e.g. in splash screens or ads). (Ibid.). Currently, the semantic space of UI ideology is somewhat centered around the terms "simple, fast, intuitive, social, minimal, choice, useful, fun", as a series of interviews with web designers suggest (Chang, 2006). Relating to the understanding presented above, perhaps the leading ideologies are: the semantic web, open source movement, the hacker ethic (Levy, 1984) and Wikipedia, all of which follow the empowering principle.

Perhaps one of the most prominent is the ideology of ease. Dilger (2000) presents the ideology of ease, which dissects users into computer illiterate and techies and suggests, that this "will ensure that the historical boundaries of gender, race and class are reproduced in computing practices for years to come." By ideologies he means the "frameworks of thinking and calculation about the world - the 'ideas' that people use to figure out how the social world works, what their place is in it, and what they ought to do." (According to Dilger's reading of Hall, 1986). This is pretty much with Mullins' view, since the way the world works refers to the cognitive and evaluative power, people's place in it and what they ought to do then refers to the action-orientation. Dilger states, that (1) ease is gendered, which is to be seen in the connotation of an "easy" to use computer system as feminine. (2) Ease has a different meaning in connection to work and leisure, during the former it has to be supported by the system, during the latter a certain difficulty could be desirable, e.g. in chess. At work, moreover, a task may not seem worthwhile if it doesn't seem easy. (3) Pictures may furthermore seem easier to understand than text, which is supported by various media, such as

television or comics. This is also connected to the notion of "pictorial turn" in Mitchell (1994). The notion of (4) speed is also connected to anything, which would be labeled as easy, including learning. Finally, (5) the gain of ease is matched by a loss in choice, security, privacy, or health. (Ibid.)

8   Interaction Rhetorics

Since Aristotle (Barnes, 1984), rhetoric is the art of persuasion. Over the decades, rhetoric was used in different media to state arguments of the designer, in order to make the audience (or the user) believe in the reality, that is thus presented. Persuasion as a technique made its way into ICTs, and has been even transformed into a tool. Fogg (2003) defines a persuasive technology tool as "an interactive product designed to change attitudes or behaviors or both by making a desired outcome easier to achieve. (Fogg, 2003:32)[4]

In the ICT environment the persuasive tools are supported by the inner workings of software, as we have stated above. These workings, based on procedures, help to get pre-defined arguments to the users. Bogost (2007) calls it procedural rhetoric. "Procedural rhetoric is a technique for making arguments with computational systems and for unpacking computational arguments others have created." (Bogost, 2007:2-3)

A specific characteristic of procedural rhetoric is, that it doesn't build arguments using techno-images, but "through the authorship of rules of behavior, the construction of dynamic models." (Bogost, 2007:29) Therefore, procedural rhetoric works in the space of medialization, between design/intent and design/form. In such a manner, it is close to a "grammar of interaction" (Brejcha and Marcus, 2009), where language plays the part of a rule system. In the system, the UI designer establishes grammar rules (syntax) for the combination of its elements. The manner in which UIs are built is governed by a set of rules given by the designer, e.g., every UI produced can follow a different intrinsic language grammar. The choice of elements is then subject to the strategy or objective (pragmatics) of the entire UI.

9   Conclusion and Future Work

In this paper we have presented semiotics as an analytic method a theory, especially its most complex dimension – pragmatics. Pragmatics stands in the design process at the beginning, because it forms the strategy and purpose of the developed UI. In the sign context pragmatics leads the meaning interpretation – what meaning (semantics) will be assigned to which syntax elements. Not only this process of interpretation, but also the UI development strategy is subject to ideology in a large extent. Such ideology adapts its specific form in the UI. For the ends of developing new UIs, but also for interacting with the UIs already in place, it is important to know the ways, in which pragmatics, as an interpreting principle, is coded and mediated. In the conclusion of the paper we have presented also one of the semiotic methods – semiotic engineering – that could be suitable for decoding the way of working of UIs based on ideology, or persuasion.

A solution of how to leverage such a situation is on one hand maximizing one's competence in terms of coding forms and medialization that has a big impact on the creation of UI. On the

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[4] cf. "...all of Fogg's techniques use technology to alter actions or beliefs without engaging users in a discourse about the behavior itself or the logics that would recommend such actions or beliefs." (Bogost, 2007:60-61)

hand there is a need to develop methods analyzing the influence of such UI in/on the society, the creation and modification of meaning and human relations, that would be able to uncover the design behind every design.

To deal with this problem we propose building a lightweight software tool for gathering contextual (semantic) annotations. By using the semantic annotation tool the designer's intended meaning and the user's interpretation of the meaning could be easily compared and modified in a later iteration. The evaluation would take place in an interaction timeline environment, where user comments and the relative UI hierarchy (i.e. the position on the interaction path together with the related time-stamp) would be captured. (Brejcha, 2008)

In the semiotic inspection method (de Souza, 2006), which forms a part of the semiotic engineering approach and follows the analytic inspection method, the evaluator takes into account, how the intended message gets through to the user by means of help, documentation, static and dynamic interaction signs. This is done by (a) examining signs in documentation and help contents, (b) examining static interface signs, (c) examining dynamic interaction signs, (d) collating and comparing meta-communication messages and (e) appreciating the quality of the overall designer-to-user meta-communication. Meanwhile in the communicability evaluation (Prates, 2000), which mimics the usability testing method, a user video recording is analyzed by (a) tagging the communication breakdowns with a predefined set of utterances, (b) interpreting the mapping between tags to typical HCI problems, and (c) semiotic profiling, when the expert evaluator extracts the original designer's meta-communication.

This is in line also with Fogg's suggestion:

> "One useful approach is to conduct a stakeholder analysis, to identify all those affected by a persuasive technology, and what each stakeholder in the technology stands to gain or lose. By conducting such an analysis, it is possible to identify ethical concerns in a systematic way." (Fogg, 2003:233)

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