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"Contradictory semiotic analysis": to bridge literacies and activities in Design practice

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Abstract: To design interfaces, researchers in HCI have often set up ethnographic and ethno-methodological analysis of face-to-face situations that developers tried to emulate in on-line platform. Nonetheless, the observation of a group of designers producing an e-learning platform shows that this painting from nature/ after nature methodology is completed by a study of already mediated forms of interactions and representations of interactions. In design practice, the designer elaborates not only from the existing objects and ways of representing them, but also from the "interpretant". Here, we observed how designers use and anticipate multiple semiotic literacies when they bridge from real life situation to a mediated situation.

As the team designed an e-learning environment they realized that a virtual platform have to recreate the atmosphere of a class. To address this issue, they deployed a specific semiotic methodology that we called "contradictory semiotic analysis".

This methodology is based on a "dialog" between semiotic studies that balance the convergent effects of themes and the diverging effects of media. Here the expression "contradictory semiotic analysis" is used so as to illustrate the converging / diverging semiotic process that designers use to explore the expansion of a concept (here empathy) so that it can become operational in mediated interactions.

Key words: Semiotics, design methodology, e-learning, contradictory semiotic analysis, new media, Peirce, abduction, literacy

1. Introduction

To design interfaces, researchers in HCI often set up ethnographic and ethno-methodological analysis of face-to-face situations that developers tried to emulate in on-line platforms. User centered design has been brought in the design process to solve the obvious short comings of engineering methods that focused on the functions of objects and tested so to speak after the fact that the users found the product suitable for their needs [2]. User-centered methods were therefore introduced so that the conception benefits from a better understanding of the field [11]. These analyses have helped designing numerous systems. But they also have been criticized as not providing with truly innovative design. First, information and communication studies demonstrate that mediated systems are never a simple transposition of face-to-face situations to situations on line [7]. Sociology of techniques also shows that the design process includes a transition from a face-to-face situation to a situation mediated by a device that requires a chain of mediations. [1]. Then, research that focuses on design semantic [13] or design semiotic [5] introduce other criteria of innovative design that focus on the way design is a meaning

making process that elaborates from existing objects and ways of representing. In particular, Chow and Jonas [5] have studied the creative process of meaning making, basing their findings on Peirce's semiotics to understand design. They consider how in Peirce's semiotics there are certain dynamics of signs that open the creative process because they point to qualities of things, situations, feelings and therefore are not fixed in a solid definition of what this thing is, either in an actual situation or by habits or laws. In particular they elaborate on Peirce's theory of abduction. Following Chow and Jonas, we want to focus on the projective competences of designers. First we focus on some aspects of the Peircian theory that help understand how one can pass from an analysis of existing things to a projection of things that do not exist. We first give some elements of Peircian theory that account for the creativity of the semiotic process. Then we describe a situation of design where a semiotic methodology took place to develop an e-learning platform. Then we discuss these findings and offer to call "contradictory semiotic analysis" the confrontation between two semiotic and media spaces that allow designers to produce a new paradigm for e-learning platforms described in [8].

2. Semiotics of design

Discussions about design processes take into consideration several stages that include a sequence of activities: observing, reflecting, deciding and acting. But Jonas points out that these activities involve three different types of knowing: analysis, projection, and synthesis. What is questioned is the very sequence of this macro process. Nelson and Stolterman [15] consider that though analysis enriches the design solution it does not "cause" design. More to the point, the idea that an analysis of the situation precedes the design itself is related to an idea of design as problem solving. If design is problem solving, then identifying all traits of the situation is necessary to the design process. But if design is seen as an expansion of the real [10] then what matters more is a domain of knowledge (for example teaching) and a series of concepts [10] that challenge the situation (teaching in our example) as it is traditionally understood. Chow and Jonas contend that "existing artifacts are knowledge sources for projection of the new". They qualify as transfer the fact that "we can take knowledge from one artifact and put it in another domain or context to create something new" [5]. Visser also points out the reuse of knowledge in different circumstances and fields of design as acknowledged by many studies: "Reuse of knowledge (from specific previous design projects) through analogical reasoning has been observed in many cognitive design studies as a central approach in design" [20].

Based on these results, our study focuses on what is being re-used and how and how it builds something new. Our demonstration is based on the Peircian semiotics and theory of logic. Peirce produced a general theory of meaning making that considers abduction, induction and deduction. While induction and deduction have been discussed in epistemology of sciences, abduction has received less attention and is now a subject in design theories as explaining "lateral thinking", free associations, hypotheses. Peirce's theory of abduction is based on a theory of signs that articulates three elements. A representamen (or physical sign) refers to an object (which is an object of thought or a real object) through an interpretant (which is the mental consequence of the relationship between representamen and object). "A sign, or representamen, is something which stands to somebody for something in some respect or capacity. It addresses somebody, that is, creates in the mind of that person an equivalent sign, or perhaps a more developed sign. That sign which it creates I call the interpretant of the first sign. The sign stands for something, its object. It stands for that object, not in all respects, but in reference to a sort of

idea, which I have sometimes called the ground of the representamen" [16]. The meaning making process is in theory infinite since each interpretant becomes a representamen for another element of meaning. For example, bread suggests toasts or baguette, that then suggest England or France, that then suggest one type of breakfast English or continental, and so on and so forth. Peirce's theory is a pragmatic theory that considers the way we relate to the world not only as facts (that are true or false) but also as signs that we need to understand. In this respect, and contrary to certain misinterpretations [13], it is not only a symbolic process (such as a linguistic process). It takes into consideration the whole gamut of experience from tangible objects to feelings as we may want to understand them. Shank in his analysis of Peirce's abduction, makes a clear distinction between the same phenomenon seen as a fact or considered as a sign: "Inquiries based on facts seek to expand truth claims, while inquiries based on signs seek to enhance understanding. These goals cannot be reduced to each other". The author shows that looking at events as facts is a convergent activity: "It is, in principle, possible to state that there are a finite number of true claims that we need to make to describe a leaf "factually" since there are in principle a finite number of verifiable agreements concerning the definitive nature of a leaf". On the contrary, the understanding of a phenomenon can infinitely vary before being stabilized in one admitted interpretation, and is therefore a divergent process because the interpretant opens new evocations, new consequences. Shank describes the abductive process as coping with "surprise". In front a surprising situation, the best way to understand it is to make a hypothesis about what it stands for, in other words, to consider that it stands for something else. "Putting the original surprise into the form of a sign is what abductive reasoning is all about" [18]. In the semiotic process and the category of signs that Peirce describes, six out of ten signs actually rely on abduction. Indeed the combination of semiotic properties covered by Peirce's theory gives ten types of signs out of which only those that point to possible consequences (and not actual consequences that rely on inductive thinking or proven consequences that rely on deductive thinking) can open the design practice by considering similarities (iconic) in processes or qualities. We contend that the design practice that we observed helped considering options by creating a surprising confrontation of semiotic systems. The team created the conditions for abductive thinking first by analyzing the semiotic characteristics of existing systems then by comparing them to other semiotic systems from different media. The following section describes the designers' activity to produce the e-learning platform "VUE".

3. Description of the design methodology and results

3.1 Goals of the experimentation and our research challenges

The aim of this experimentation "VUE, a virtual class"[1] was to create an e-learning platform that would be a virtual environment, a collaborative, immersive synchronous online service for professional training. The project team was composed of designers, developers and information and communication researchers.

Early in the project and throughout the design phase, the authors observed how the group worked, which tools and methods were used to create an innovative e-learning platform dealing with the feeling of togetherness issue. The observation focused on the methodology. The challenge was to understand how designers and developers can create a platform both technologically innovative and corresponding to the needs and expectations of students and teachers. In other words, how do designers anticipate literacies of potential users while producing something that

[1] VUE means "sight" in French

will potentially unsettle these literacies. Literacies have been described by Hoggart not only as the capacity to read or write on different media but also as the cultural practices that forge a social identity. In Hoggart's analysis of media, they capture, reproduce and reinforce certain traits of popular culture so that readers and spectators find a certain familiarity with what they are offered. Though Hoggart's standpoint is primarily critical of the way media manipulate popular culture, his work points to how people use not only skills to read and write but also a whole set of values and creative distance towards media. This capacity to "read" in context is precisely what new media have to deal with as they offer not only new contents but new ways to shape, access and produce information [12].

3.2 Stage 1: Semiotic analysis of a corpus of e-learning platforms

The observation of a group of designers producing an e-learning platform showed that the painting from nature/ after nature methodology was completed by an introduction of already mediated forms of interactions and representations of interactions. The design process included hypotheses on how people interpret things, from what angle, with what references.

The first stage of the designers' methodology was to study other e-learning platforms as a starting point for their design. They constituted a corpus of analysis by collecting four e-learning websites that actors (and primarily the authors of these websites) claimed to be learning platforms.

Table 1. E-learning Training VIA[2], profile and two of the student's web cam

Table 2. Dim Dim e-learning platform[3], teacher's web cam

Table 3. ISL iMeeting[4], Student profile and other students web cam

[2] http://www.sviesolutions.com/
[3] http://www.dimdim.com/
[4] http://v5.islonline.com/isl-groop/overview.htm

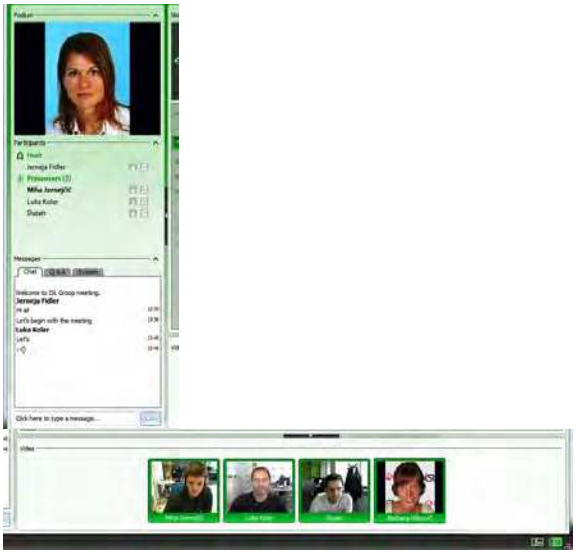

Table 4. Adobe connect[5], mosaic of web cam's students.

Semiotics scholars define a corpus as a group of texts (linguistic and visual) that belong to the same genre [17]. Texts of the same genre share structural and pragmatic characteristics in so far as they are not only similar in style, narrative structure, or visual organization, but also as they are discussed by social actors as targeting the same audiences, for the same purposes, with similar textual strategies. The constitution of the corpus does not pretend to be exhaustive. It is always but a segment of the actual production. The purpose is to gather enough material to answer a research question. The method therefore consists in defining a corpus of artifacts and considering what are the shared elements and their purpose in the text. In this particular instance, the design team looked at how e-learning platform supported a representation of the class. They conducted a semiotic analysis on the following points: rendering of environments, representation of actors, terms of interaction and possibilities of multiple points of view.

Results:

As the team designed VUE, they realized that a virtual platform is not only a space for coordination between actual people [9]. A virtual platform creates participants as actors and characters who play a role in a space that they animate. But, the semiotic analysis showed that none of the platforms from the corpus recreates a classroom atmosphere. Indeed, as we can see on these screenshots of e-learning platforms, no interface represents the classroom as a whole. What is more, students are not always shown on the screen (table 2: only the teacher is present). On other interfaces, students are present through a line of their webcams (Table 1 and 3) or a table of their webcams (table 4). These design choices make it very difficult to represent all the students on the screen and thus cannot easily contribute to a feeling of belonging to a class. In addition, these four platforms offer a single

[5] http://www.adobe.com/fr/products/connect/

type of class: the conference mode. We also noticed that the dispersion of avatars/users in the representations of the class made it is difficult to actually create a feeling of togetherness. This finally appeared to be a critical issue to be dealt with, also because the team learnt that pedagogical researchers find that the feeling of loneliness is one of the main reason of failure of e-learning [3]. So, one of the design challenges was to create an atmosphere that represents students, teachers and their interactions. To design it, the team left the design space of e-learning platforms that did not provide with semiotic cues to do it. They felt the need to explore how these feelings (togetherness and representation of self and others) were dealt with in other media to try to recreate it in VUE. They further identified a quality that they considered as essential to fight the feeling of loneliness in e-learning contexts: the concept of "empathy". The design team explored how empathy can be supported by representation of the class.

3.3 Stage 2: Semiotic analysis of the concept of "empathy" and of the feeling of togetherness in other media

After this first analysis of a corpus of e-learning platforms, the designers delineated another corpus composed by visual media: painting, photography, film and comics. They especially analyzed how each media aesthetically treats the issue of self-representation and the representation of different characters at the same time in different spaces (to see different scenes at the same time, to make ellipses in time and space, etc. A concept emerged: empathy. Empathy is based on mechanisms of information processing for an implicit communication with others and is the basis for intersubjectivity [6]. Empathy, as the ability to share another person's point of view, increases attention and improves understanding of the lesson and group exercises. So, the design team analyzed how media dealt with the issue/concept of empathy.

In cinema, in particular, they noted that empathy means that the viewer is made to share the viewpoint of the character either through a first person narrative viewpoint or with medium shot (to feel closer to the actors, to simulate an immersion in the scene) and close-ups (to show facial emotions). But empathy is not only built through first person narrative. A number of other shots give the spectator a feeling that she is part of a group, that she can share the general view that characters have from inside the movie: the experience of dialog in a group can be rendered through bird eye view or ¾ shot that have all the actors visible to the camera (in particular to allow complicated dialog scenes between more than two people without changing camera position). The way the scenes and the characters are shot is not enough to provide the feeling that you can change viewpoints. Editing techniques in cinema (and subsequently in video and 3D world) provide dynamic change of viewpoints: shot and reverse-shot for example, to simulate a dialog, etc.

Results:

They highlighted a number of elements (tools, visual effects) used in these media to promote the feeling of togetherness and empathy and tried to adapt them to VUE platform. For example, they noticed that empathy is not only built through first person narrative. So, they multiplied points of view of the class in the device thanks to a control room [8], like editing techniques in cinema (shot and reverse-shot for example). It provides the users with different viewpoints on the same situation. This solution empowers users to choose the relevant point of view, as if choosing from different cameras.

Thanks to this analysis, the design team also introduced in VUE two points of views:

- A global view of the class from the back of the room to give the users the possibility to feel part of a whole group. It is a slightly "false" natural view point as it builds in fact an "omniscient" view point and not a personal view point. On their screen, students have a high angle shot of the classroom, from the last row.
- A personal viewpoint from the student's seat. The student is also represented in the classroom by an avatar. Since students chose their place, designers had raised the possibility that they could see the hall from their seat, simulating maximum immersion. However, this position masked a portion of the class (behind the students) and therefore part of the information. The avatar solution was decided to avoid this difficulty.

4. Discussion: contradictory semiotic analysis

The design team deployed a semiotic methodology based on abduction and literacies. They considered that users would be familiar with other more traditional media that addressed the question of representation of togetherness. This media literacy could be transferred to a new media. Bolster and Grusin [4] speak of "remediation" when then consider the actual production and reception of these new media. We propose to call "contradictory semiotic analysis" the process by which designers extrapolate a quality from existing platforms that support a similar service and contrast the different ways other media treat the same subject: from painting, photography or video.

This methodology is based on a "dialog" between semiotic studies that balance the convergent effects of themes and the diverging effects of media. The word contradictory is borrowed from the field of rhetoric and law. It means that all information pertaining to a case have to be explored and presented to both parts. Each element of a case is therefore discussed so that contradiction can arise, supporting defendant and prosecutor diverging view points. This conversational side of the design process has been introduced by Schön in the Reflective Practitioner [19]. Schön shows how a designer "shapes the situation, in accordance with his initial appreciation of it, the situation "talks back" and he responds to the situation's back talk" [19: 79]. Here the expression "contradictory semiotic analysis" is used so as to illustrate the converging / diverging semiotic process that designers use to explore the expansion of a concept (here empathy) so that it can become operational in mediated interactions. This methodology allows getting to a certain level of abstraction (to define togetherness and empathy) and then to consider other possibilities that are then borrowed from other media to design a more innovative device.

5. Conclusion

In this paper we consider semiotics first as a theoretical basis to understand the design process as a meaning making process and second as a methodology that designers use to explore the design question and to expand it by tapping into other media. Semiotics therefore stand for two different things: on the one hand following Peirce and scholars who use Peirce to analyze the process of meaning making in design, we consider what is the basis of design and in particular abduction and how it allows for the transfer from one field of knowledge to another. Abduction relies on the open iconicity of meaning making: some quality is experienced that points to something else even though it is not there yet. In their analysis of the e-learning platforms, the team "felt" that something was

missing, had the "intuition" that the challenge was about being together before even learning anything. This feeling of potential is qualified by Peirce as Firstness that is to say the way we feel about something even though it is not present in front of our eyes. The first semiotic analysis had therefore a specific purpose: to get an impression, to look for what was not there. They supported this "gut feeling" with more theoretical readings of texts on e-learning issues. The second semiotic analysis had a different purpose. It looked for different interpretations of togetherness as it is represented and purveyed in different media. The semiotic process here is mostly based on comparisons and confrontations of actual media aesthetics: actors, icons, texts, tempos, editorial traits, etc. The semiotic process at play is mostly based in Secondness that is the plane of actual facts and objects and how they are structured but also how they can be combined and recombined.

This contradictory semiotic analysis addresses therefore two kinds of issues. First, it is a way to generate divergent ideas, which is a crucial challenge in the conceptual design work. What our case shows is that the semiotic analysis of other media dealing with the same issue is a way to reduce convergent thinking and break free from what other similar platforms do. Rather than staying with the characteristics of one media, designers can play with other media interpretations and representations. Second, picking up from other media, is a way to address issues of literacies. Users have to interpret complex systems of signs that support a variety of activities that usually are dealt with in "real life" or with other media (like a video or a book). The difficulty is to be innovative while allowing users to recognize traits of communication, to understand the purpose of the document (digital or otherwise), the value of the text that they read. They therefore need to be given hints to fully comprehend the mediated situation of communication. Incorporating other media forms is a way to shape the users' reception.

This method bridges the gap between literacies and activities because:

- Semiotic analysis considers not the activity itself but the representation of the activity. To do so, it considers a corpus that is designated by actors as e-learning platforms. The hypothesis is that e-learning platforms capture something of the learning activity and that they support this activity through proper representations of the basic elements of this activity.
- Semiotic analysis is based on visual and textual culture: the hypothesis is that the target – people seeking e-learning activities – have a certain media literacy that they can mobilize while looking at a new application. Borrowing from other media and from other activities support the interpretative process of the user by giving him/her a chance to also project from one domain of literacy to another to finally achieve the task.

This double/contradictory semiotic analysis presents limits because first the corpus is not exhaustive. In particular, other applications that are not qualified as such might well be incorporated in a larger sample of services and interfaces that actually provide e-learning. The method in this particular instance is not radically innovative in the sense that it preserves the structure of e-learning platform and modifies it only marginally. But semiotics also means that designers use semiotic analysis purposefully to delineate the perimeter of their design.

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