**PBL and Stories of Body in the Hospital World.**

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This story/stories of how I moved around in the hospital world for a limited time should be read as emergent, “subjective” and personal, and based on structured feelings and experiences, but at the same time I try to use established, scientific procedures that are at the very basis of any kind of questioning, story-telling or investigation of a problem. Throughout the chapter I shall discuss how and why cultural analysis and body could have a say and a meaning in relation to considering a technological problem where techniques, organizations and people are in a process of change.

The current status of EHRs in the Danish health care system is far from perfect as regions and decision-makers try to deal with the various technical, economic and organizational problems. My investigation of EHRs has focused on what might be termed the human aspects. By making video-observations of the use of EHRs in particular settings, I have tried to identify some of the human factors involved, and in particular, see how the human relations, especially communication, in the hospital have been affected. My emphasis has been on the body and, not least, the “body-language” that can be observed through a video camera.

## Presenting the problem

*She looked at the screen on the wall showing a brand new interface of a trial model of an electronic health record. She sighed almost ecstatically and moved her body forwards on the chair as she exclaimed: “This is beautiful, why didn’t we have this from the very beginning”.*

*We were at the end of the trial period (3 months) and finally the computer department at the hospital had managed to create something that all of the participants at the conference approved and appreciated. She was the only one expressing out loud what she thought of the interface, but everybody else in the room were moved by her words and body language.*

*She looked at the screen and was puzzled by the various layers of meaning and expression in the representation of the patient that was lying next to her. For many minutes she interacted with the screen seeking counseling from the nurse standing behind her. She tapped in information in various columns and boxes in the schemes of the record and paid very little attention to the patient in bed. Some times she would ask the patient for information, but she would not look at her or revolve her bodily attention towards the patient in bed. The ward-visit ended and the doctor had spent more time than usual in the consultation, but less time in interacting with the patient in bed.*

*She looked in a very perplexed way at the screen and shouted out loud: “The patient has disappeared!”! It stood clear that the patient she was about to visit had vanished from the screen and despair was at hand. She tried to phone the ICT department, but they were busy elsewhere and then she tried to involve a ’super-user’ (a nurse) in order to solve the problem. Meanwhile the patient was lying just a few meters away and was able to overhear the conversation and probably understand the problem. She had disappeared! The problem was solved (by miracle it seems) 15 minutes later and the ward-round could move on.*

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These are three events that actually took place as I recently followed a ward-round at a hospital in Denmark. In the midst of the situation I was not aware of what was going on. The events taking place seemed pretty harmless and quite straightforward, and it was not until I began video editing the observations that I had made that I reflected upon the meaning and importance of the events. I had documented the situations on a video-camera and the force of the pictures became apparent as I looked through the material that I had recorded together with colleagues.

I began to wonder why apparently emphatic doctors and nurses would “forget” the patient on behalf of virtual representations on a screen, and why no one in representing the final edition of the video-observations seemed to notice what I thought was a major problem: How could doctors and nurses forget the physical patient?

I began to ask questions and wonder and I think that this wondering and has to do with my training as a researcher, teacher and supervisor in a problem-based learning environment.

## Problem-based learning, or PBL

PBL (problem-based learning) and related research perceives reality in terms of problems to be solved. It originally grew out of an action-oriented approach to research and education where science, technology and human affairs are seen as intertwined, entangled and interactive. At its best it tends toward interdisciplinary, transgender, cross cultural interaction and methodologically it makes use of case-studies, be they singular or multiple.

PBL is concerned with all the aspects of the classical Aristotelian division of knowledge in *episteme, techné and phronesis*, but with an emphasis, as I see it, on *phronesis* and *techné*. The classical problem of whether scientific and technological innovations should take place or not is not relevant in terms of *episteme,* but is crucial if we look at the problem from a *phronetic* point of view.

By emphasizing the humanistic and societal aspect of PBL I go along with the original idea of the so-called Aalborg model concerning PBL, which can be summarized in the following quotation by Knud Illeris: “The crucial aspect in PBL is that it does not take a stand in disciplines that have been constituted in the past and were a result of bygone societal relations and constructions, but deals with actual problems by applying relevant knowledge, theories and methods from the disciplines”. (Illeris 1974: 80) (my adapted translation).

In this perspective Bent Flyvbjerg has, in a PBL context, drawn a synthetic scheme that might help us to understand the importance of values and interests as we produce knowledge and technology.

Flyvbjerg identifies the field of *techné* as being where concrete problems of the real are located, and we can approach the “technical” field from two opposite positions, either from theories and laws or from values and interests.

Flyvbjerg claims that it is in the realm of *techné*, where theories and laws and analysis of values and interests are translated into practical activity that we find “how things ought to be done”. (Flyvbjerg 1988: 60) The notion of “ought” is a distinct phronetic/ethical term, which Flyvbjerg readily admits. In translating this into a problem based research-method Flyvbjerg made the following list of recommendations:

* stay close to reality
* emphasize details and context
* focus on everyday life
* study specific cases
* investigate what and how on behalf of why: tell stories
* focus on actors and structure

In the present study of problems in the healthcare sector I have tried to follow the recommendations made by Flyvbjerg and have stressed the importance of reality, everyday life, context, narratives and dialogue (communication). I have been concerned with PBL and knowledge production in a mainly engineering educational context, which is traditionally based on a hypothetical and deductive way of dealing with knowledge, hence relating to the epistemic and theoretical forms of knowledge. In this view the objects and products are seen as a result of prior construction of hypotheses and of testing in models that are based in theory. Theories and hypotheses are in this perspective considered as value-free and neutral, which means that the results and products cannot be otherwise. Objects, artifacts and technologies have no meaning or “identity” that goes beyond what is found in the objective theoretical construction.

In the course of my research I have come to realize that knowledge can never be value-free when people are involved, since people have interests and agendas that cannot be disregarded or ignored. In a PBL context this becomes even more apparent, because a problem is *something* for *somebody.* In engineering *something* is an existing (or future existing) object that is (or will become), which means that it is crucial to consider the problem solution process with regard to the problem as being real and there for somebody to consider, act upon and eventually reflect upon.

In doing this it becomes clear that problems are more than hypothetical and deductive in their essence, and what should be striven for (in accordance to the recommendations made by Illeris and Flyvbjerg) is an approach that seriously and critically considers the societal and cultural potential and possibilities in any problem solution.

In this perspective product, artifact and object become bearers of a societal and cultural identity, which makes it so that we should be able to reflect upon that identity. It is obvious that this kind of reflection has very little to do with the hypothetical and deductive method, and considers the things in a constant process of making where a multiple core of variables influence the outcome of the process. The affluences and influences are layered in the object forming a character of identity, which according to the interests, values, involved actors and contextual layering can be seen and understood as technical, functional, aesthetic, material and so forth. In any case there can be no doubt, seen from this particular PBL perspective that objects have a say (by being embedded in the process, the history and the actors involved) and the stories that they tell cannot be heard and understood in a meaningful way unless we focus on processes, history and the actors themselves.

Approaching these concepts in a theoretical scientific way it becomes imperative to investigate the problem from different angles than the laboratory and model based reality of hard-core engineering.

## Theoretical background

Evidence is what appears clearly and unmistakably in front of our eyes, and the tales told on the basis of evidence are radically different than those told on the basis of hypothesis and conjecture. Evidence is in its essence unquestionable and beyond dispute, and concrete and corresponding statements can be made on behalf of evidence. Statements concerning evidence can be transferred and translated, and therefore it seems quite natural that a system, like electronic health records (EHR), which tends toward general and universal classification and standardization revolves its attention toward evidence as the main way for controlling the undertakings and on-goings within the system. Evidence is at the same time tied up in the “lens-paradigm” of Western science and culture, hence relating to theory and observation as scientific background. The ground structure for electronic health records in the Danish health care system is envisioned in a PBL rationale, but the disciplinary emphasis in modern medicine on evidence is to a large extent incompatible with the current PBL approach, because the latter, in my reading, goes beyond the mere concrete and evidential.

Recently, Michael Hård and Andrew Jamison, in their book *Hubris and Hybrids. A Cultural History of Technology and Science* (2005) have tried to take a cultural approach by looking what they term “sites of cultural appropriation” where technology and science are actually put to use in society. No meaningful and useful technical artifact is purely based on empirical and analytical scientific procedure, but entails human endeavors, intentions, experiences and processes of creative appropriation, which are, to a large extent, based on our cultural values and traditions, as well as our “*body skhemas*”. Merleau Ponty’s notions on embodiment are dealt with in an other chapter in this volume therefore I shall only give a short summary of the *body skhema* in my perspective:

* General quality and capacity of the human body (aesthetics).
* Common attitude and perception of the body (ethics).
* Universal and cyclical perception of time and space, hence fusion of past, present and future (experienced physics).

Hård and Jamison are certainly far from phenomenological in their approach but in the stories they tell, they complement the more abstract philosophical notions of Martin Heidegger in showing that: “there is nothing technological about technology”. In any case, they provide a number of concepts and examples by which we can consider technology as something other than technical, showing how users become co-constructors or innovators, by the ways they appropriate technology into their lives.

Hård and Jamison write in their conclusions that our analyses and explanations of technology have become ever more specialized, fragmented and domain-dependent, hence obstructing a deeper and more holistic understanding of the ways and means of technology: “a historically oriented cultural assessment of technoscience requires that we tell new stories of the past, stories that can transcend the polarization between romance and tragedy” (Hård and Jamison 2005: 294). This means that we need to break down the boundaries between hard-core natural science and soft-core human science in order to truly understand the socio-technical “hybrids” that have emerged from the combinations of science, technology, economics and society.

Neither wholly heroic nor completely tragic the stories of science and technology need to reflect the ambiguities and ambivalences that characterize our human interaction with our technical things. In order to do that we have to “look elsewhere” so to say than merely into the technical, professional and/or disciplinary history of for instance medicine, because the latter will give us only uncritical and primarily heroic narratives focussing on progress and evolution. Hård and Jamison write: “Cultural historians, however, tend to be highly critical toward such all-encompassing and congratulatory stories. In contrast, they attempt to uncover alternative stories, “small narratives, that not only view the past from other perspectives but also represent less grandiose, more mundane events” (Hård and Jamison 2005:304-05).

In considering the terms introduced by Hård and Jamison in *Hubris and Hybrids. Cultural Appropriation of Technology* (2005) on this more contextual level we find *internalization* as crucial for the cultural appropriation of technology and science.

*Internalizatio*n on a phenomenological level has to do with embodiment and experience that goes beyond intellectual verbalization. In the words of E.M. Bruner: “As social scientists we have long given too much weight to verbalizations at the expense of images. Lived experience, then, as thought and desire, as word and image, is the primary reality.” (Bruner 1986: 5) Our interactions with technologies on a lived experiential level have to do with “emotions, values, ideals and strong feelings” (McCarthy and Wright 2004:2) which are difficult to embrace and explain on a scientific level, but as science and technology are touching and concerning our everyday life and we understand our lives and existence through our everyday life, then we have to find concepts, terms and methods for enhancing and promoting the importance of experience and cultural appropriation. The proposition of this chapter is that in supplementing and complementing already existing concepts, terms and methods for understanding the impact and use of technology we have to turn our attention toward culture and body, because: “Technology in the contemporary world involves cultural values, ideologies, ethical concerns; it is also shaped by political and economic determinants” (Murphy and Potts 2003: 4).

We relate to the outer world, as Merleau Ponty points out, of technological problems and potentials through our bodies and these bodies are multiple and in order to a grip on the complexity of problems and potentials we have to take into consideration all of these bodies.

The American philosopher Mark Johnson has distinguished five bodies that interact with the world in slightly different ways. I have chosen to present the five bodies in the following list and briefly comment on their essential qualities..

1. The biological body: The conglomeration of flesh, bone, organs, skin and liquids that makes the body an object in time and space would be the definition of the natural scientist, but Johnson places more meaning into the body as a biological organism. The above mentioned elements that constitute the biological body “makes possible the qualities, images, feelings, emotions, and thought patterns that constitute the ground of our meaning and understanding” (Johnson 2007:276). Our biological bodies are not outside ourselves or our brains, but actively engaged in creating meaning and understanding through the *body skhema,* as described by Merleau Ponty.
2. The ecological body: If we demarcate the environment and the body then it is an artificial and constructed division due to our interests and values. “…we must think of organism (or body) and environment in the same way that we must think of mind and body, as aspects of one continuing process” (Johnson 2007:276). There is no real distinction between body and environment, and the efforts made within dualistic and analytical science fail to see that if such a distinction is made, then both environment and body will suffer.
3. The phenomenological body: “This is our body as we live it and experience it” (Johnson 2007:276). Johnson talks about a *body image* which is generated within us as we move, act and perceive in time and space. The image: “capture our reflexive and self-referential perceptions, attitudes, and beliefs of our bodies at this phenomenological level (Johnson 2007:276). The *body image* is hence interdependent with the *body skhema*, and if we are to take the considerations made by Johnson seriously there is not a hierarchical relationship between the two, just a higher degree of reflection at stake as we live our phenomenological bodies.
4. The social body: Johnson is very brief concerning the qualities of our social bodies and writes: “We are who we are in and through others and by virtue of our intersubjective capacity to communicate shared meanings” (Johnson 2007:277) The essence of the short description is that there is a certain overlap with the ecological body, and it is hard to understand why Johnson divides the context into environmental and social.
5. The cultural body: Besides dividing the context into physical and social he introduces cultural context: artifacts, practices, rituals, institutions and modes of interaction. (Johnson 2007:277) Our bodies are to some extent culturally constructed but “the reduction of the body to the mere physical organism is just as misguided as the opposite error of claiming that the body is nothing but a cultural construction” (Johnson 2007:277).

I think that the quintessential body as pictured by Johnson could be reduced to a three dimensional body, without losing meaning or clarity. The context *is* physical, social and cultural; and how the body interacts and interplays with these ‘different’ kinds of contexts are not essentially different; as can be seen as well from the analyses made by Johnson. We might act on a more sensorial and physical level with the ecological environment; and on a more reflective (phenomenological) level with our social and cultural surroundings, but in my opinion this division, and to some extent as well hierarchical levelling, leaves the body behind on behalf of imagining and reflection. In fact Johnson seems to place mind over body, which was certainly not his intention. Nevertheless I find the list useful in mapping the body in its various qualities and potentials, as well as the notion made by Johnson of not reducing body into a physical organism nor a cultural construction, but to embrace the body as a revealer and bearer of identity and self that goes beyond the flesh and incorporates- embodies - cultural and social attitudes.

## Body and technology in the hospital system.

The video material at hand covering a morning-session before the introduction of a trial EHR and material that covers a morning-session after the introduction of a trial EHR. The figures present in the two sessions are more or less the same, with the exception of the ward-nurse. This means that we can actually make a comparison between the two sessions concerning time, space, technology, and attitude and behaviour of the actors in play.

In the session before introduction of the EHR it is quite apparent that everybody has fairly routine-like attitude towards the various common spaces in which they find themselves. There is a certain flow of communication and interaction, which mainly deals with papers and documents that circulates around the paper-journal. The doctor has a daily practice of ripping paper into halves at the morning conference, because she obviously likes that format (A5) and it probably means that the paper is easier to fit into her pocket. At the morning-conference there is a certain kind of movement and interaction as the conference moves on, because everybody has a say and a role concerning the procedures of each patient. The therapist knows about procedures for rehab for the singular patient, and she tells everybody else in the room, whilst the doctor nods her head. And in the end a unanimous decision will be made and registered on the white-board concerning further procedure.

It was quite evident during the take that things and bodies were moved in time and space as the conference moved on, and there was a lot of talking going on. The morning conference finishes at 8.50 AM sharp, because at this point the doctor normally keeps her morning-break and drinks her coffee and eats some bread, in order to be ready to prepare more thoroughly for the ward-round. As she considers the various amounts and kinds of medicine that each patient should be given she pauses and looks at a picture on the wall. She talks to the camera saying that in the future she will probably not be given the chance to think whilst writing, because it will be a matter of filling in boxes and changing a pair of digits. She is a bit frightened about this, but ends up saying that the time spared on this behalf will provide more time to the patient and probably she will find other ways and procedures for thinking whilst acting.

The ward-round is a 2 ½ hour session that covers the visitation of 25 patients, which means that there is approximately 6 minutes on average for each patient. As everything is in place, concerning the paper-journal before entering into the room there is very little time consumed in the handling of the papers and the journal, as doctor, nurse and patient are interacting and communicating for a relatively brief period of time. It was the experience at the ward-round before the trial EHR that the doctor would place the paper-journal on the foot-side of the bed and move towards the patient and ask how she/he was doing. During the conversation the doctor would eventually pick up the journal and explain the more precise and quantitative aspects of the ongoing care and treatment. The bodily directedness of the doctor and the nurse was obviously interrelational, as they interacted with the patient and amongst themselves.

If we look at the situation after the introduction of a trial EHR then we see a different picture concerning interaction and communication between staff, and furthermore between staff and patient. All the staff was as emphatic and in good mood as during the 1st take, so changes could not be ascribed to a different mood, but probably to the introduction of the technology.

It became apparent from first sight that all types of information-technology were in play, despite the fact that the EHR was meant to replace personal noteblocks, the nurse-cardex and the paper-jourrnal. Illustration 1 shows how a nurse is handling, at the same time, three different types of technologies – her own personal notebook, a more official cardex and the EHR, making cross-references and duplicating from one media to another.

If we look at the two places in question, the nurse group-room and the conference-room, then considerable change is visible. The lap-top and the images on the screen are gradually eliminating interaction and communication, as nurses sit on their own and the doctor is navigating the crew from the centre of the room by the aid of the computer.

Even if the computer has become crucial it is not replacing the other types of information-technology, which the images and the video-movie show very distinctly. Staff is now supposed to handle much more data and technology than before, and it is quite symptomatic that the doctor ends up saying that the conference only took 10 minutes longer than before introduction of a trial EHR. We are talking about a very small unit of 30 beds and that particular day there were only 21 occupied beds in the ward, so probably it was due to the coverage of beds that delay had been shortened compared to other days in the trial period.

In illustration 2 we are still at the conference and I have chosen the image because I find it fairly emblematic for the whole discussion. In the middle we see the doctor, surrounded by technology, manipulating the computer. She is looking down as if in control of the device and ready to move on to the next step. She is as well surrounded by staff; in this case the ward-nurse, a therapist and a secretary, and they are all moved by the commands of the navigator as their whole attention is directed towards the projection on the wall. They are presented to a new interface of the trial model, and they are all expressing enthusiasm and the nurse says it is fantastic. What they are looking at is a traditional screen-image that resembles an excel screen, with columns and rows, which makes it hard for an outsider to understand the immediate enthusiasm, because the interface was not even tried out. We are talking about a mere presentation of a representation, where no interaction took place, and as such the mere static representation managed to overwhelm and capture the viewers in place, from nurse to secretary. The force of the iconic, geometrical figure is, as can be seen, impressive.



Ill. 1: *The nurse is handling three information-technologies at the same time*. (Botin 2004)

Referring and duplicating data from one media to another. She is sitting alone, which was emblematic to the situation after introduction of a trial EHR. Interaction and communication with colleagues and peers diminished radically, if we look into the nurses’ group-room.



Ill. 2: *At the end of the conference the doctor presents a new screen-interface and all of the staff is literally moved and taken by the ‘beauty’ of interface*. (Botin 2004)

The doctor, as a captain on a ship, is navigating, surrounded by technology, the staff that physically follows her commands from the screen.

At the conference the staff gets ready for the ward-round and some of the following procedures of ordering papers and data in order to meet the patient was of course eliminated by the new procedures, which means that the ward-round began more or less at the same time as before although some of the staff had to cut their morning-coffee break. The set-up for the ward-round was pretty impressive with mobile wagons carrying both lap-top and paper-journals.

It seemed as if this new set-up of mixed media also mixed up and jammed procedures, because at almost every visitation there were problems of finding data, either the physical ones on paper or the digital ones on the screen. The ”movie” shows quite clearly how nurse and doctor are frustrated over the missing paper-journal, which is found after 10 minutes of search lying on top of the wagon managed by the doctor! A similar frustration is at hand as a patient disappears in cyber-space and they cannot find her on the screen. The nurse says that it often happens; and that the problem has not been solved yet by the IT department. Another 10 minutes passes by whilst the IT department finds the patient in the system. Meanwhile the whole communication, which takes place in the corridor, is quite loud and both doctor and nurse exclaim that XX has disappeared, whilst the patient in flesh and blood is lying 10 feet away listening to their communication.

The last sequence to mention concerning how body is absorbed by technology, deals with a visitation where the doctor and the nurse are totally engaged with the computer and hardly pay any attention to the patient. The wagon is rolled into the room and the doctor sits down in front of the computer. She is placed in a perpendicular angle to the patient lying in bed, very similar to the position she had before introduction of the new technology. But whereas the paper-journal was placed in the bed and only consulted a few times during visitation, then the slightly different position in the new set-up makes it so that the doctor is looking away from the patient and that the directedness of her body is turned towards the wagon and the computer. The doctor talks to the patient, but rarely looks at the patient, because she is busy typing and filling in columns and rows in the EHR.

All the attention of the doctor is directed towards the virtual patient on the screen and she interacts with this patient; which of course is a representation of the patient, but only a partial and virtual replica of what/who is lying in bed. The nurse is bending over the shoulder of the doctor and never engages with the patient as she mutely and with hands folded on her back follows the occurrences on the screen. The example evokes the experiences of the Canadian philosopher and sociologist A.W. Frank as he fell ill and was treated in the Canadian health care system: ”Real diagnostic work takes place away from the patient; bedside is secondary to screen side. For diagnostic and even treatment purposes, the image on the screen becomes the ‘true’ patient, of which the bedridden body is an imperfect replica, less worthy of attention. In the screen simulations our initial certainty of the real (the body) becomes lost in hyper-real images that are better than the real body” (Frank 1991:83)



Fig. 1: Conceptual sketch of how clinical actors are caught by the digital setting of the ward-round. Botin 2007

The patient is lying in bead on the left side, whereas the doctor and nurse are concentrating on the lap-top on the right side. This was of course not the physical out-line of neither subjects, objects nor space, but an interpretation ‘in situ’ of what was actually going on.

We learned during the 1st and 2nd takes that the staff of the ward was highly empathetic to patients, relatives and colleagues, which means that this absorption and negligence could only be ascribed to the technology and not to changes in their personalities. We feel assured that these findings would not have become apparent if the actors were asked to reflect upon this in questionnaires and interviews, and at the same time it is even unsure if the images shown to the staff made them reflect upon this.

I think that the force of the pictures is quite striking in this regard and that phenomenological video-observation, where we look into the directedness of bodies in time and space in order to gain knowledge concerning interaction and communication, has shown potentials and qualities that complements and supplements other methods for observation.

## Findings

The main results of the cases that were investigated in the Danish hospital system in relation to introduction of EHR, can be presented in the following way:

* The management, organizational and bureaucratic language at the upper level, contaminated by acronyms and abbreviation, make the language and communication incomprehensible to the other actors in the field. This means that the healthcare providers are more “knowing”, than the actors (patients, secretaries and nurses) at a lower level in the hierarchy. The transfer of data, from one box to another is increasingly made through intermediaries who are more aware of the actual meaning of the message than the receiver.
* All actors in the field are to some extent familiar with one common tool – language – but the specific vocabulary is limited hierarchically. In the development of digital communication through computational devices, the software and hardware are accessible to only a few actors in the field. Shutters and barriers are ever more governing the direction of electronic systems for reasons that may be thought beneficial, i.e. in order to protect the patient’s confidentiality perhaps. But the result is that communication and interaction is restricted and power is placed in a few hands following a prescribed hierarchy.
* There are widespread attempts to replace paper records by EHR. Paper records can be chaotic and can be manipulated at all levels, but there is transparency. It can, in principle, be accessed by even the “lowest” actor in the health care system. In contrast, the architecture of the new electronic patient record is hierarchal designed, which means that information is restricted as it gets more confidential, not necessarily to the benefit of the patient. This means that the EHR is turning into a black-box comparable to the way we produce engines for automobiles today. Once a mechanic was able to repair/interact with an engine with a wide repertoire of possible decisions. He could even put non-authorized items in the engine to make it function. Today the auto-mechanic orders authorized spare parts from the company and is increasingly less knowledgeable about the overall user function of the engine and its total construction. One might fear that the same evolution will take place as EHR records are constructed where actors are increasingly left out of the design of the system, and power is in the hands of administrations and system-developers.
* The study has shown that the self-understanding of the lifeworlds in the healthcare organization and the alleged “objective” reality do not fit, with severe consequences for both staff and patients. One way of addressing this problem is to document and communicate the extent of the mismatch. The phenomenological and iconographical video-observation has value in this respect because it is immediate and situated. The phenomenological and iconographical video observation is a strong tool, because it is directed, empathetic and seeking authenticity in what it reveals. It enhances the nuanced richness of context and reality, whereas detached video observation does not take into account the way in interactivity and communication are key avenues of human and technological interactivity.
* The study also shows that communication and interaction within the professional order, i.e. clinical communication, takes place in another way than the actual system and the ongoing construction of EHR, tries to reflect. The organization is not a hierarchical and systemic gestalt, with fixed laws and rules for communication and interaction. The methodological approach to the subject matter exposes this very aspect and the value of the investigative tool (video) is enhanced by the ontological foundations of the method.
* The study demonstrates the value of emphasising subjectivity and intentionality and need for design to be driven by human intentionality as it is revealed in reality, driven by intentions based on values and what Merleau Ponty calls *skhema* (holdings). In doing this we are trying to emphasise ideas and values in order to engage in a dialogue. It might never turn into an objective given thing and as such legitimised, or becoming a fact, but I am willing and in place (*Dasein*, as Heigegger would have it).

**Perspectives and concluding remarks**

The study set out in emphasizing the importance of PBL in approaching situations and events of the present, because the core issue of PBL is to find solutions, potentials and possibilities of the actual and situated. I have tried to stress the fact that technical or theoretical solutions to problems have shown themselves to be problematic, and have drawn on perspectives concerned with cultural aspects of techniques and institutions/organizations, social consciousness, *body skhema* and hybrids as antidotes to hubris (Hård and Jamison). I think we have to find a way that stresses the potential in facing problems, which means we have to be pro-active, imaginative and positive in our approach. This means that we have to admit to science the capacity of producing human value and of art to be able to say something general and trustworthy (Mumford 1952: 140).

My study shows that PBL is in need of a “retouch”, opening up for what could be called a field of in-between or hybridization (Hård and Jamison 2005) where science and values/interests plays an equal part, where our various bodies could find potentials and possibilities for evolvement and improvement, becoming learning and understanding creatures by the aid and means of technology. It is in the in-between or the hybridization that the potentiality of problems in open-ended solutions really shows and on that account it would be worthwhile to dwell for a moment at the thoughts of Gilles Deleuze and Felix Guattari concerning the potency of the in-between.

The middle is in general considered as a calm and quiet realm in between extremes. I envision the middle, or the in between, as do Deleuze and Guattari as they state in a *Thousand Plateaus* (1980):

 “A rhizome has no beginning or end; it is always in the middle, between things, interbeing, *intermezzo*……… The middle is by no means an average; on the contrary, it is where things pick up speed. *Between* things does not designate a localizable relation going from one thing to the other and back again, but a perpendicular direction, a transversal movement that sweeps one and the other way, a stream without beginning or end that undermines its banks and picks up speed in the middle”. (Deleuze and Guattari 1980/2007:28)

It is in the in between where dynamic reflection and metamorphosis takes place and the drive is infused by objective and analytical scrutiny and phenomenological subjectification. The Hungarian artist and important member of Bauhaus Lazslo Moholy Nagy claimed this to be the essence of human endeavour: “We cannot establish a universal intellectual attitude or cultural standard from one vantage point only, such as cognition by means of logic, or the sciences, nor indeed from the arts exclusively. In order to form a comprehensive attitude to existence, we must start *simultaneously* from emotion and cognition.” (Passuth 1982: 320)

Problems are in this perspective in between the ideal and the real, and of the world and reality. It is our perception and conception of potentials, possibilities, frictions and break-downs that constitute problems, which means that problems are not ideal or of the world, but exactly placed in between reality, which is subjective, and the world which is existing beyond our knowledge and objective.

In understanding this dynamic position and meaning of problems we find that in order to learn we have to take a multiple, simultaneous and inter-disciplinary perspective where cultural studies have an equal importance to social and scientific studies.

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