DESIGN FOR ENSKILMENT:
Anthropological insights for interaction design

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ABSTRACT

The design of computer-based products originates from the development of workplace tools and systems, along with the core values of efficiency and usability. The tradition of designing work environments comes with questionable assumptions when interaction design is moving into different contexts. For example, in healthcare there is a trend towards integrating devices and systems into the home and the everyday life of patients. Self-care by patients requires a new perspective to allow the products to weave into one's fabric of being through use. Anthropology offers approaches that can help us see patients as skilled practitioners and in turn to design for enskilment rather than usability.

INTRODUCTION

A few broad interaction design trends
Devices and tools shape our movements even as we use them to make sense of the world. I propose that we need to find suitable interactions with products where our bodily skills reinforce sense making by creating an appropriate awareness of the ebb and flow of changes occurring in the environment or even within our own bodies. During the transition from physical tools like ropes and hammers to information-laden devices, such as computers and mobile phones, products increasingly place more emphasis on cognitive skills instead of relying on motor skills. Three trends become apparent when looking at the intersection of healthcare and technology and should be questioned if we want to use them as the basis for future product design: person-centric healthcare, digital demassification and information over action.

First is the move towards person-centric healthcare (Fauchet et al, 2004 and Kilbourn, 2005). In practical terms, this means healthcare wherever you are and not confined to location-based, centralized places like hospitals and clinics. But this also places a huge burden of care onto the patients in which they have to manage self-care tools and devices. Non-compliance of recommended treatment plans is already problematic. This creates an even larger gap between giving patients responsibility and empowering them with the tools to manage self-care.

The second trend is towards digital demassification. It has been suggested that use error, the improper operation of the device, vastly outnumbers failures from the medical devices not working properly (Food and Drug Administration, 2003). Some see this as a consequence of being awash in information so that medical devices are mutating into computers rather than "hands-on, physically interactive tools" (Wicklund, 2004). One way to counter the affects is by moving from data-centred to perceptual-motor-centred interaction (Djajadiningrat et al, 2004). In a similar effort to ward off demassification, Ehn and Linde (2004) put forward the idea of mixed objects with various ways of integration from placing digital on top of the physical to full enmeshment as a way to design beyond the physical-digital divide.

Finally, I wish to call attention to the trend of favoring information over action. Social researchers Mol & Law (2004) have identified the overvaluation of information and ask "what are the consequences if action is privileged over knowledge?" They show how diabetes patients through doing enact hypoglycemia, while becoming self-aware of their bodies. Listening to one's own body may be a possibility in appropriate circumstances, while a product can be used in situations where this becomes impossible.

Going beyond the limiting "factor" of usability
The design of medical devices is dominated by Human Factors Engineering. Fries (2001) defines Human Factors as "the application of the scientific knowledge of human capabilities and limitations to the design of systems and equipment to produce products with the most efficient, safe, effective, and reliable operation." Take notice of the focus, not on skills, but rather on efficiency and usability. This comes from the tradition of designing work environments (Sawyer, 1996) but with the move towards self-care by patients, these goals should be questioned in the design of medical devices. Bannon (1992) exposes the paradox of designing for ease of learning as it does not allow for "growth of competence" or enskilment. While medical device design should retain its focus on safety, it should not disregard enskilment which is necessary as part of becoming a self-care practitioner as the overall trend of mobile healthcare proliferates.

Why advocate for tools that allow for enskilment? In healthcare, the body is always changing or in a perpetual state of becoming. This constant back and forth between

good and bad periods of health takes a toll on patients and contributes to their feeling of illness. It is this unplanned and without forewarning of health acts that deviates from what is considered "normal" that disturbs many patients (Kilbourn, 2005). Patients need awareness of fluctuating bodily states to remain reactive to these changes. Design for enskilment focuses not on ease of learning, but towards continual growth. This shift in design perspective requires a deeper understanding of people and body use. The field of anthropology can offer several insights to designers working on enskilment as it has an extensive tradition of looking at skill and skilled practice.

THE BODY AND TECHNOLOGY

Technology and society's impact on the body
The body has been a rich source of study for producing an anthropology of movement. Mauss (1992) introduced "techniques of the body" or ways learned from society that people know how to use their bodies. Numerous examples include swimming techniques, feeding, and techniques of rest. Patterns of body use, according to Jackson (1983) can be shaped by the interactions of everyday objects, for example how working at a computer all day creates the posture of the hunched office worker. Tenner (2003) looked at various body technologies such as baby bottles, shoes, chairs, keyboards and helmets in an effort to describe the effects these technologies had on the way we use our bodies. Tenner laments that while learning these new body skills, we have lost a great number of others. As an example, one style of sitting is replacing the numerous other ways that anthropologists have documented in various societies across the world.

Ingold (1993) maintains that the historical trend of technology creates a division between knowledge and practice and does away with skill by separating practical knowledge and knowledgeable practice. He says, "for acting in the world is the skilled practitioner's way of knowing it" (1993: 434) and can be characterized as tacit, subjective and context-dependent. This is contrasted with technological knowledge that is explicit, objective, and context-independent so it can be taught. The movement from technique (skill) to technology means that devices have moved from tools to machines (Ingold, 1993). Machines differ from tools in that do not depend on human agency and for the most part operate independently. Ingold characterizes this as a moving from the personal to the impersonal. It is time to critically look at this movement and see what it means to design tools instead of machines or devices and the impact on people's ability to make sense of their context.

Ecology of skill
Describing skill involves looking at the entire system, which includes the person in an environment, not to be seen purely as a result of a disembodied mind moving a physical body (Ingold, 1996). "Critically, this implies that whatever practitioners do to things is grounded in an attentive, perceptual involvement with them or in other words, that they watch and feel as they work" (Ingold, 2001). He even suggests a stronger embeddedness of skill in that they grow with a body and are integrated within the anatomy itself (Ingold, 2001). Learning is a process of enskilment and cannot be separated from doing as the culture of acquiring skills is denounced by Ingold (2000: 415) who says that "the novice becomes skilled not through the acquisition of rules and representations, but at the point where he or she is able to dispense with them."

Short example from the field
Home dialysis allows patients whose kidneys have failed to clean their blood at times of their own choosing and in the comfort of the home setting. Dialysis requires the use of a large machine typically hooked up to the patient through the arm for several hours at a time while the blood is cleansed and circulated back into the body. As a result of several in-home interviews and simulated walk-through of device use, I present an example of a patient as skilled practitioner where the patient chose treatment options in a close connection between the body and technology, a necessary condition when bringing the hospital home. In this snippet, the informant tells about the intricate balance of taking out the right amount of fluid during dialysis:

> "I think I could tell some things, which a doctor can't tell you because I know exactly how it feels, what to do and what you can't do. An example...for example can be if you take a dialysis over 8 hours, and you go and your weight says 90 kilos...and I have to be down to say 86 at the moment. Maybe 86.5 would be my perfect weight...my perfect balanced weight. Okay, so I have to get down 3 and half kilo. That's pretty simple. I program that into the machine, it can easily happen that next day I go and weigh myself right after. I only weight 85.5. So where is this 1 kilo? Just disappears...just if you sweat a little bit and 1 kilo it's gone. So it's a little bit dangerous to just make a calculation. You have to have a feeling. Do I feel well? And how was it last night? Did I sweat? Did I not sweat? The weather...is it hot? … And that is purely experience. The doctor, if he tells you, it's only because he knows it from somebody."

Dialysis requires patients to be attentive to fluctuations in their own weight, but there can also be conflicts between what the scale says and how they feel. This informant also told of a time when the scale said he was at his correct dry weight (right after dialysis) and he started to get a headache, which is a sign that he had gone too long on dialysis. But the blood pressure was extremely elevated signifying to remove more fluid. He pushed ahead and continued with dialysis. He tells me about the usual role of headaches:

> "…Tells you it should be your limit. But actually it wasn't. Must have been something else. I don't know what it was…but gave me the headache. Maybe I watched too much television."

RELATION TO INTERACTION DESIGN

Looking at skill from an anthropological approach has several implications for interaction research. The first is that enskilment occurs through the use of products. There is a growing interest in interaction design that supports skill development, compared to the relatively simple interaction of touching a button as the style common in

modern technology products, which relies mainly on cognitive processes. The second implication is that skilled practice is not just about applying force but also involves qualities of care, judgment and dexterity (Ingold, 2001). This means that product interactions have to incorporate subtle and varying ways of perceptual-motor skills. As a result, practitioners develop relationships with their tools through continual use. How designers make products that allow for enskilment will be crucial for healthcare tools if we view patients as skilled practitioners. To be able to design products that appreciate the body and even strives for enskilment, designers have to understand the resonance between bodily skills and tangible product interactions.

Designing for enskilment conceptually requires designing tools rather than machines. Taking this cue from Ingold means that automation is not always the answer, but rather the objective is to find what is the appropriate role of the tool to allow for sense-making in the particular context. Representations of space have traditionally had priority over time, where designers have focused on the spatiality of tools instead of the temporality of them. There is a need for tools that allow growth, as enskilment happens over time. These *tools to understand change* would allow for an integration of knowledge and experience. Perby (1987) conducted a study of local weather forecasters and found that processed information is harder to "assimilate" into one's conceptual framework. This work looked at meteorologists and how they develop an "inner weather picture" during the course of their workday. There are interesting parallels to healthcare as designers are working on ways of bringing loads of data and information to the fingertips of patients. But how do patients bring this all together to make sense of health? How do they develop an inner health picture or rhythm? Perby says that meteorologists analyze maps by tracing patterns of weather and looks at the fusion of different kinds of knowledge and experience (integrated understanding) with how this is combined with the senses to create awareness (sensibility). It remains to be seen how this works in healthcare.

CONCLUSION

My journey through anthropology has been more than a fleeting interest and has yet to meet its end. Integrating an anthropological approach into my methods has driven me to reconsider ways of designing, especially the idea of enskilment and the contributions of such a term. The most difficult part is then to take this knowledge from a separate field with its own traditions and interests and apply it to an adjacent but with wholly unique objectives. There seems to be an inherent conflict between anthropology and design. If one uses anthropological methods to fully study and understand how others work and live their lives, it becomes harder to suggest changes as you see more openly the possible disruptions that could occur. Designers have an awesome power to change people, for better or worse; anthropology provides ways of seeing and hopefully a buffer against changes that do not bring value to those for whom we design.

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