Is There a Future for Human Factors in the 21st Century?

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"...The development of Mosaic/Netscape is a good example of the value of Human Factors. We should use it to convince our high level management that they should invest more funds in this area..."

A distinguished Speaker, 1996

I was quite surprised to hear this declaration at a Human Factors meeting a few years ago. After all, Mosaic was developed by undergraduate students who might never have heard the term "human factors". This made me ponder why did the distinguished speaker not find better **recent** examples developed by the Human Factors community instead of resorting to a development not made by this community? How could such a breakthrough in human computer interaction (and human information interaction- HII) be developed without the help of the Human Factors community? Could the Human Factors community in its present form design and develop such a visionary interface? In the rest of this paper, I would like to dwell on some of the related but crucial questions and challenges facing the Human Factors community.

To my mind, the issues are straightforward. Measurements and usability testing have been the cornerstone of our profession. The achievement list of Human factors is quite long (in areas including, for example, information displays and other sensory level systems, refining the computer mouse, and the desktop metaphor). However, in the process of doing our work, we have lost some of our vision.

This community attracts talented people who are interested in the important details of practicing this noble trade. To push the envelope further, we need more people who have a broader and fresher (though sometimes uncertain) look—people who can look into the future and come up with new ways of thinking. Measurements can come later.

Not everything can be measured or modeled. Natural decision making is a good example—people make decisions based on not-so-logical considerations. Tacit knowledge is another example. Could everything be expressed precisely with words or

[1] The points of view expressed by the author do not reflect the official policies and points of view of the MITRE Corporation.

equations? How could Human Factors in its present form evaluate interfaces and processes that cannot be mathematically or precisely defined (e.g., storytelling)? We need to form a deeper contact with people for whom we design a system, a contact different from the one formed by asking questions or filling out forms.

Human Factors needs to be more humanized (Bice Wilson, private communication). There is no average human being, no one uniform culture, and no one common objective interface. Different people and different cultures might require different genres or even different media. User satisfaction is a prime goal even if at times it is subjective. The Human-Computer Interaction community does not invest enough resources to address these essential issues.

We need to rediscover the power of common sense. Certain things are obvious and do not need to be measured. Certain things cannot be measured easily or not at all, but nevertheless are quite important. Aesthetics, taste, coherence, simplicity, and feeling good do matter (John Seely Brown, private communication). In some situations, models are helpful and in others they could be an impediment. The challenge is how to find the balance between intuition, common sense, good design, and measurements.

We seem at times to have lost our good sense of design. Here is an example: at a meeting on Human Computer Interaction a few years ago, the coffee cups were in one corner of a large exhibit hall and the coffee in another. At the same conference a few years later, the coffee condiments and tea bags were invisibly far away from the coffee and hot water (see figure), yet no one seemed to complain. When I complained, some people didn't

understand why. We need to pull our heads from the sand and do more of what we preach. Design is more than just cockpits and computer interfaces—it encompasses all aspects of life (see, for example, Don Norman's *Design of Everyday Things*).

We need to reconnect with the social context and impact of the systems we help to develop (John Seely Brown, private communication). The way people are accustomed to doing things seems to make them comfortable. When we develop new genres, we develop new "socially constructive interpretive conventions" (Brown and Duguid, 1994) of ways of doing, interacting, and interpreting. This is negotiated between the developers and the users and it takes some time to develop and mature. Again, the professional Human Factors community does not pay enough attention to these important considerations.

Some Promising Beginnings

There are some promising beginnings, however. These approaches include user experience design and participatory design. In user experience design, the interface includes the total experience of the user (see, for example, *Experience Design*, by Nathan Shedroff). In participatory design, people actively participate in the design of their information systems environment. Here are some examples:

"Think of the computer not as a tool, but as a medium," says Brenda Laurel in her book *Computers as Theater*, where she proposes to use the vast experience we have gained over generations from theater in designing user interface. In Apple Computers' Guides Project, Abbe Don, Brenda Laurel, and Tim Oren used anthropomorphic agents to help people find information. Storytelling is another way to involve people in the design process. Tom Erickson describes the use of storytelling to get information from users about "messy, ill-defined issues that pervade their daily practice."

Final Word

"Je pense, donc je suis" ("I think, therefore I am"), René Descartes, 1637
"Je mesure, donc je suis?" ("I measure, therefore I am?"), 2001

Traditionally, Human Factors has been only a part of the process of development. To enhance the perception of upper management about the necessity and importance of the field, it has to rise above the details, be more visible, broaden its perspective, and incorporate design and system evolution development in a more proactive way. The Human Factors community desperately needs to recruit designers and artists into its crowd, and it needs to capture the heart of the people.

These are not easy challenges, and they require more than a quick fix. However, addressing the issues I have outlined is necessary for improving the health and strengthening the future and the potential of this important field. Overcoming these challenges will enable Human Factors to develop future systems equivalent to the mouse and the Web browser.

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