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From the Editor in Chief

THE RIGHT CONCEPTS FOR THE RIGHT PROBLEMS

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The concepts we use, in many ways, influence what we perceive. If a cardiologist investigating the human heart with an ultrasound device shows us the visuals, it is easy to see the same movements of pixels on screen that he or she does. We would see how white and black spots keep flowing in a specific pattern. If the cardiologist points out a white spot as a blood vessel, we could probably discriminate it easily. Over time, we might be able identify the regular movement in a white area as one of the valves and the black area reflecting the blood moving from one chamber to another. We also would see how the numbers along the side of the screen keep changing. Yet, even with these observations, we would not be able to make much of a diagnosis.

What we would not know about this experience is that the ultrasound tool is not necessarily very effective when looking at the vessels of the heart or what the numbers mean regarding blood flow. And we would not even know whether everything is in order. So although we could see various aspects of the heart and blood flow, we would not have the concepts nor the related systems of experts' knowledge, to fully comprehend the images projected onto the screen.

This same reality applies to modern technologies. Today, when ICTs are playing larger and larger roles in our lives, their design and development are becoming very complex issues requiring many types of knowledge. Creators of technologies need to understand electronics, signal processing, and information about raw materials. For example, designing devices for construction work requires the ability to know how to keep the equipment from becoming too dirty too fast. And in contemporary television technology, the focus is to find a way to save electricity, which is a goal quite distinct from the engineers' work a half century ago. As a final example, it is difficult to keep data signals in optimal form as they move around the globe. Thus, it must be remembered how difficult it can be to get technologies to always work reliably in society. Such work nowadays presupposes a deep understanding of the human dimension, which in turn presupposes in-depth knowledge of human research.

The development of technologies in past centuries has had quite a different emphasis. These machines and devices had been special purpose tools, which meant there had been a clearly definable user need that was intuitively recognized and understood through common sense. Even complex technologies such as engines, ships, or paper machines had a very clear

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need to serve and an easily identified user. Therefore they were easily and obviously positioned in the society: Paper is needed by publishers and private persons for a variety of everyday needs. Of course, some analysis was required, for example, to make a good paper handkerchief; specialized uses had their requirements. But these problems were primarily technical: How can it best fill its goal? Is it affordable? Does it look clean and can it stand, for instance, the high humidity or high temperatures in locations where it might be used? These are important questions in the design process, to be sure, but the act of using such a product is relatively elementary and intuitive.

Today's machines, however, are more likely to be technically general-purpose devices. This means that the same technology can be used for multiple—perhaps many multiple—different, and sometimes quite distinct, purposes. As a result, the primary goal is no longer definable in simple technical terms, meaning the physical, electrical, or chemical concepts. While these concepts are essential in creating the devices, they have practically no direct relationship with the actual human use. The set of possible user needs and the ways of using any given technology are growing exponentially in complexity. Because of this new reality, designers can no longer easily rely on traditional technical concepts. In fact, this reality is changing the basic technical concepts in some critical ways. In some cases, these traditional technical concepts can easily block development rather than aid it. This arises because traditional concepts do not help us in seeing what is happening on the ~~–s~~creen" of human life.

At times, the novelty of a design situation has been surprising, and perhaps the designers' concepts and assumptions were not what they should have been. In many of these cases, the design process was lacking sufficient information about human life, human needs and desires, and human interaction. It became clear that the concepts of human science were not implemented within in the technology design. In reality, it takes time to fully develop tools reliable for solving human technology interaction problems. The basic concepts of life and human sciences, therefore, often have been tapped for solving design problems that are connected with human–technology interaction.

In biology, the theories of evolution have been foundational concepts because they explain so many critical phenomena of life (Dawkins, 2009). However, they do not offer much understanding of the problems of human–technology interaction: Evolution operates at a too general level. Meanwhile, theories in psychology have provided insight into very important issues, such as infant-to-adult development and the nature of schizophrenia. Again, while these are vital issues, they have very little to do with human–technology interaction. The same applies to history and literary critique: How could they add their perspective to the whole understanding? Finally, sociologists have done much in identifying and investigating a wide variety of topics and issues that assist in understanding the differences between communities and societies (Tönnies, 1887/2002; Weber, 1922/1978). On the eve of fully developed social media practices, these concepts might become important, if only we knew how.

In general, the development of technologies has resulted in situations in which technical concepts provide very little to assistance to designers and engineers to helping them solve the problems technologies use: Human research has not yet reached a point that clearly articulates what design professionals should do. In our present positions—ever changing between the past and the future—we wrestle with how ~~–w~~hat has been" can be readily adapted for what is and what is to come. This can best be observed regarding issues of law, and specifically copyright protection. Emerging technical possibilities create social situations that are not easily resolved

through current laws. Copyrights, for example, were made to protect artists. However, technologies today often provide multiple ways to circumvent the restrictions. How do we, as societies and members of societies, address such challenges? Of course, the open-source movement, which values free access and the sharing of ideas and product, does not view contemporary law as the only means of creating and distributing technologies. Balancing the proprietary rights of creators and producers through legal means versus free access is one of the major conceptual changes for contemporary artists and knowledge producers.

We humans—and designers in particular—are living and working in situations that place enormous demands to our conceptual systems. And, in order to continue progressing as a technological species, our conceptual systems must be redesigned. Of course, such an adaptation need not be as revolutionary as were needed following, for example, the development of the printing press or the innovation of the steam engine. But such a renewal in our conceptual systems is required, whether we like it or not: We either learn to see clearly the important phenomena around us—and for us—or we fumble around like blind kittens.

In this special topic issue, we can again see work that has been done to improve our way of conceiving human technology interaction. The six papers published here reflect the work of the eminent John Carroll, our guest editor, as an outgrowth of a collaborative workshop that explored the intersection of creativity and rationale in software design. Each paper explores a perspective on the role of creativity in the application of design rationale, or how rationale can facilitate design creativity. Both are essential when our considering how conceptual systems—as design professionals and ordinary humans—can be expanded.

REFERENCES

Dawkins, R. (2009). *The greatest show on Earth: The evidence for evolution*. New York: Free Press

Tönnies, F. (2002). *Community and society* (C. P. Loomis, Ed. & Trans.). Devon, UK: Dover Publications. (Original work published in 1887; original translation published in 1957)

Weber, M. (1978). *Economy and society* (Vols. 1 & 2; G. Roth & C. Wittich, Eds.; E. Fischoff, H. Gerth, A. M. Henderson, F. Kolegar, C. W. Mills, T. Paarsons, M. Rheinstein, G. Roth, E. Shils, & C. Wittich, Trans.). Berkeley, CA, USA: University of California Press. (This translation based on the 4th ed. in German, J. Winkelmann, Ed.; original text published 1922)

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