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From the Editor-in-Chief

THE IMPORTANCE OF THE FREE FLOW OF INFORMATION AND KNOWLEDGE

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Since the dawn of the Industrial Age, our societies have seen a continual, incremental flow of more and more complex technologies and new practices involving human-technology interaction. When looking at the development of these technologies, one begins to notice that the innovations are reflected first in the general knowledge that influences product design and production, which is then spread within the society by specialized companies. It is rare indeed when a new innovation, perhaps products such as cellular cameras or mobile TVs, takes the general audience by storm or is spontaneously produced in final form. For the most part, new ideas result in small changes: progress that the average person hardly notices. Perhaps the innovations reflect changes in the knowledge of ergonomics, or about the emotional impact of a design. Ultimately, much of what happens in improving human-machine interaction is completely unknown to the user.

This same reality can be found in the knowledge generation needed for conceiving and developing technical innovations. New or expanded knowledge can often be outside the gaze of designers and engineers. Sometimes this is because they have no need to be aware of the mathematics, physics, or material knowledge required, for instance, to create a quality lens for a camera phone. The usefulness embedded within a particular knowledge is often considered meaningless unless one is a specialist addressing particular problems. Those addressing other problems may easily underestimate the necessity of basic scientific knowledge derived from investigating human-device interaction.

For example, an underestimation of the psychological knowledge about human perception and behavior is especially easy because people regularly use their own intuitions and behavioral experience as the grounds to resolve interaction problems. While there are times when this might be effective, more often these intuitive approaches bring their own risks and create their own problems. One's own intuition can be counter to established knowledge in interaction design, and solutions to perceived problems may violate the general principles of human information processing. Therefore, accurate knowledge about the true problem, about the complex aspects that affect the problem and potential solution, and about how humans tend to think, react, and behave is essential for developing practical, innovative

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solutions. It requires getting the requisite knowledge in applicable form to the best point in the design process. And many times, to reach this goal, we must break down some mental barriers that we have built inside our minds.

Throughout recent centuries, the world has witnessed groups of highly skilled individuals within specific arts and sciences who raise the level of quality as the result of social interaction. These groups can be called skill or technological subcultures. Examples of these subcultures include the artists of the Italian Renaissance, the composers and musicians in 18th and 19th century Vienna, or the Swiss watchmakers. Because of their close proximity to other members within this subculture, new ideas, new approaches, and creative thinking flowed freely among them, raising the level of quality for all—perhaps substantially beyond what any of these individuals might have accomplished if working alone. As a result, the artisans within the ranks of these subcultures became globally known for their expertise, even though they remained locally based. Today, such subcultures are spread across the globe. Therefore the need for knowledge to become more widely dispersed is essential. To get new information to the right people at the right time requires knowledge producers to break down many different barriers.

The barriers to the flow of information are not just geographic. A fissure can be found between universities and private companies, which tacitly means between scientific knowledge and product knowledge. With the pace at which technological innovations today surface and find their way into practical use in societies, it seems maintaining a division of labor between the two types of organization in regard to interaction design is counterproductive to both camps. Knowledge becomes significant only when it is expressed in practical terms, such as product development and other applications. However, information becomes knowledge and applicable only when built upon the ever-growing body of basic knowledge, which is discovered in the academic inquiry of the university.

To achieve such a complementary fusion of knowledge, those interested in the creation and application of knowledge need to find ways to scale the fences that might separate them. Such fences involve the languages (both cultural and terminological) of the fields of expertise, the different social rules and forms of expression between and within organizations, a lack of trust, and varying goals and interests, to name a few, which create barriers to effective communication and the quality use of knowledge. One possible means of bridging the gap between these distinct cultures is through open access scientific publishing.

Open access journals make knowledge and discovery freely available for those who need it. As search technologies gradually improve, knowledge seekers shall undoubtedly find it much easier to surface the pieces of knowledge needed from among a great variety of available information. Open access journals allow those who seek information to find those whose prior seeking has resulted in new perspectives, new data, new knowledge. For this reason alone open access journals are an essential part of communicating about scientific research findings and knowledge. And it seems that open access publishing is an especially natural way for university research to be distributed for the greater good. The salaries paid to university researchers normally come from public money, by extension from the taxpayers. Ethically, it seems a good principle that knowledge generated through the support of the general public should be equally available and, perhaps beneficial, to all the members of society.

In years past, the university was viewed as a local school, where young students learned what they needed to know through oral instruction from those more highly trained. The students attended the lectures, fulfilled their requirements for study, perhaps completed some type of research project, and were awarded degrees as competent masters or doctors of their

fields. When they left the university, they rarely needed to come back for more. But in today's ICT-infused world, this historical reality is no longer valid—and in fact cannot exist. No one is ever fully competent, because knowledge advances with increasing speed. Throughout the world, knowledge is being generated in incremental pieces; those envisioning innovation must seek out important pieces of knowledge everywhere and all the time.

One particularly important example of a field where this free and wide flow of information is needed is represented in this special issue. In developing innovations and products for all of us, including individuals or user groups with special needs (e.g., the physically, cognitively, affectively, or sensory challenged), product innovators must be able to discover—and be inspired by—the new knowledge generated through university research and company implementation. Open access publishing can play a vital role in disseminating both basic research knowledge and the results of applied experimentation.

If universities keep the new knowledge behind their walls or offer limited access to it, then they have overlooked their duties to society. And if government officials, who make decisions regarding university funding for research and dispersal of research knowledge, do not see that new scientific innovations must be easily and effectively offered for the use of society, then the barriers to innovative use of new ideas slow down the availability of knowledge to those who need it and who have paid through their taxes to create it.

The time seems right to give up the old images and practices regarding research, knowledge, and innovation. Open access publishing makes it possible, but also necessary, to look at the role of basic knowledge within society and the roles of university research in the webs of innovation management in a new way.

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