From the Editor in Chief

THE PROBLEMS OF PROFESSIONALS

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When we discuss interaction and communication technology (ICT) usability, the images of ordinary users facing difficulties in getting things to work come easily to mind. People who struggle to use digital applications or find mobile services, or feel lost or frustrated when trying to use all of the features of a remote controller seem to form the very stereotype of users that interaction research should help. How my auntie, elderly neighbor, or disabled brother could survive in an ICT-infused world is a recognized problem today, although not that long ago, their problems were not a priority. The main focus of the research had been on early middle-aged families with Western backgrounds (Czaja, 1997; Newell & Gregor, 1997).

Of course, concentration on the "ordinary" people is acceptable on several grounds. Consumers form the widest audience and markets for new ICT products. They also may have the least amount of time for learning new environments and gadgets. Finally, they often possess the lowest level of computing skills or technical know-how. This is why emphasis on the usability of applications is understandably of great importance among interaction researchers. However, it would be a mistake to think that usability should be directed only toward solving the challenges of ordinary people.

The interaction challenges of the professional are a much less clearly recognized problem than the concerns for everyday consumer interaction. One might think that technology professionals easily understand what other professionals need and that professionals in general do not make similar mistakes in using technologies or solving interaction problems via ICTs as do to individuals with everyday technology use. Moreover, professionals appear to have the time and the skills, are often within an appropriate age group to be familiar with various types of technologies, have expertise in what they should do with computing or other ICT devices, and are usually willing to invest the time and energy to learn new devices or applications. They are generally educated and experienced enough so that they can be systematically trained to use new software or technologies, and it is easier for and more typical of them to seek and obtain the needed support when they confront interaction problems.

While many of these assumptions may be true, nevertheless these arguments miss one important point: The tasks of professionals via ICTs are far more complex and critical than the tasks in everyday computing and ICT use.

Take, for instance, surgeons or other medical professionals, for whom losing time or information as a consequence of poorly constructed interaction systems is safety critical. Similarly, officers at the helm of a huge ship or, perhaps more importantly, workers at a nuclear power plant, still must be thoroughly familiar with—and have easy access to and use of—all essential, even if even rarely used, features of their complex, contemporary technologies. Because professional ICT-facilitated interaction is constantly increasing and becoming more ubiquitous, it is essential that interaction researchers give specific attention to how experts use technology. While human factors researchers have done much work in this area, much still remains to be done. For example, when it can take a business professional untold hours over the course of a year to complete and submit travel expense documents, or when someone is expected to read a hundred-page-long users' instruction manual in order to store a couple of numbers in a computing program, it is easy to see that this area is underestimated and underresearched. These interaction realities are complex issues.

A classic example of this interaction complexity challenge is computer programming. This complex task requires immense cognitive energy and skills. This reality has not been lost on a community of researchers who initiated some of the earliest attempts to make technologies simpler for users, and the professionals who create the technologies. The first programming languages were designed to help programmers remember the code. Similarly programming paradigms, such as structured programming or object-oriented programming, were intended to make programs easier for the programmers to comprehend and remember. Thus psychology was employed to help improve the work conditions for professional programmers, and thus opening a new field of research: the psychology of programming. The very foundation of this work points to the need to observe and address the challenges of professionals—whether they are computer programmers, or medical or business professionals. The outcomes of the field of computer programming reflect the emphasis on good expert-computer interaction. Furthermore, the rich tradition of this field offers a large body of knowledge that can be transferred to other professional fields.

We are pleased to have a special issue on the psychology of programming in *Human Technology* because few areas of professional interaction research have equally developed the practices of discourse, analysis, and developmental design. The papers of this issue reflect not only concerns about computer programming, but also topics that can provide the foundation for exploring many other aspects of expert-technology interaction. From this research foundation, knowledge about the psychology of expert interaction with technology can feed ongoing expert-technology research in more diverse fields, such as medicine, education, aeronautics, business, energy, and transportation.

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