

## **Calm Technologies in a Multimedia World**

*In an ideal world, computers will blend into the landscape, will inform but not overburden you with information, and make you aware of them only when you need them.*

**By Alexandru Tugui**

*"In the twenty-first century the technology revolution will move into the everyday, the small and the invisible. The impact of technology will increase ten-fold as it is imbedded in the fabric of everyday life. As technology becomes more imbedded and invisible, it calms our lives by removing annoyances while keeping us connected with what is truly important. This imbedding, this invisibility, this radical ease-of-use requires radical innovations in our connectivity infrastructure".*

*-- M. D. Weiser*

Multimedia, interoperability, and intelligence science hold the attention of the information world today. The jump to tomorrow's technologies will require the incorporation of the computer as a common item of such technologies. Thus the computer will remain omnipresent in the background as a facilitator. It has been said that a characteristic quality of tomorrow's technologies is that they will be calm. The term, first used by Mark Weiser and John Seely Brown in the early 1990s, has been interpreted and built upon ever since. This paper briefly presents some dimensions of the concept of calm technology against the multimedia background of tomorrow's world.

### **Historical Clues**

The idea of calm technology originates in the writings of Weiser of Xerox PARC who in 1991 in his article "The Computer for the 21st Century" [1], tackled in detail the concept of **ubiquitous computing** in one's daily life. Weiser with Seely Brown collaborated in December 1995 with the publication of the book "Designing Calm Technology" [2]. These publications laid the conceptual basis of a future society dominated by **calm technologies** and the **Internet**. Afterwards, other specialists have continued to develop the concepts launched by Weiser and Seely Brown.

In 1997, on the anniversary of 50 years of computing, the same article was published under the name, "The Coming Age of Calm Technology," in the book "Beyond Calculation: The Next Fifty Years in Computing." [3] Afterwards, other specialists added their ideas to the concept of Calm Technology, including B. Hermans, in "Desperately Seeking: Helping Hands and Human Touch." [4] These ideas appeared and developed as multimedia was rising as a basic information technology.

### **The Evolving Human-Computer Relationship**

Internet, Internet2, intranets, extranets, cyberspace . . . it is hard not to have heard or read about one of these terms in the media. [5] Several trends categorize computer use in the information era.

1. **Mainframe stage.** Computers were used by experts behind closed doors, and regarded as rare and expensive assets. This stage was the beginning of the information era. The human-computer relationship was one of several humans to a single computer.
2. **Personal computing stage.** In this stage the human-computer relationship became balanced in the sense that individuals had one-on-one relationships with their computers. This stage brought a certain closeness into the human-computer relationship.

3. **Ubiquitous computing stage.** In this stage one person will have many computers. People will have access to computers placed in their offices, walls, clothing, cars, planes, organs, etc. This stage will have a significant impact on society.

The Internet and applications deriving from this technology will mediate the transition from the first stage to the third stage. It is clear that information technology expands every second, which leads to the question, how will this technology disturb us? Will it be aggressive toward the environment in which we live?

D. Rijken [6] formulates this issue in the following passage:

*"Consumer electronics, telecommunications, the computing industry, the entertainment industry and the media industry are all entering the digital arena. All information will be digital; all information will be inside computers and computers will be everywhere. While technological innovation contributes to human progress, some people experience the world as a technopolis that causes feelings of alienation and aversion with regard to technological products. People are still people and many of them are having a hard time trying to make sense of all the information around them. They are feeling bad about it. Yet, our ability to function and survive in the future depends on our ability to relate to information. Can we interact with this cybersoup in a meaningful way? Is there an alternative for the technocratic approach?"*

These concerns led to the concept of calm technology, which assumes that computers should disappear into the "background" of our architectural space and easily switch between the center and the periphery of our attention much like ambient displays.

Weiser and Seely Brown summarize eloquently this future stage in which humans use a large number of computers in the social environment:

*The most potentially interesting, challenging, and profound change implied by the ubiquitous computing era is a focus on calm. If computers are everywhere they better stay out of the way, and that means designing them so that the people being shared by the computers remain serene and in control. Calmness is a new challenge that UC brings to computing. When experts use computers behind closed doors, calmness is relevant to only a few. Computers for personal use have focused on the excitement of interaction. But when computers are all around, so that we want to compute while doing something else and have more time to be more fully human, we must radically rethink the goals, context and technology of the computer and all the other technology crowding into our lives. Calmness is a fundamental challenge for all technological design of the next fifty years [7].*

### **Informing without Overburdening**

Technology attracts our attention at different levels of awareness. It is either at the center or the periphery of our attention.

Weiser and Seely Brown suggest that we attune to the "periphery" without attending to it explicitly. When driving a car, for instance, our attention is centered on the road, the radio or our passenger,

but not on the noise of the engine. But an unusual noise is noticed immediately, showing that we are attuned to the noise in the periphery, and can quickly to attend to it. What is in the periphery at one moment may in the next moment be at the center of our attention. The same physical form may have elements in both the center and periphery.

A calm technology will move easily from the periphery of our attention, to the center, and back. This is fundamentally calming, for two reasons. First, by placing things in the periphery we can attune to many more things than we could if everything is at the center. Thus the periphery is informing without overburdening. Second, by recentering something formerly in the periphery we take control of it. Peripherally we may become aware that something is not quite right, as when awkward sentences leave a reader tired and discomforted without knowing why.

Technology is closely linked to the concept of affordance which is "a relationship between an object in the world and the intentions, perceptions, and capabilities of a person." [7]

### **Characteristics of a Calm Technology**

Calm technology has three basic characteristics.

- 1. Calm technologies shift the focus of our attention to the periphery.** This technological orientation can be achieved either by smoothly and easily shifting from the center to the periphery and back, or by transferring more details to the periphery. An example is a video conference that, by comparison to a telephone conference, enables us to attune to nuances of body posture and facial expression that would otherwise be inaccessible.
  
- 2. A technology is calm when it increases peripheral perceptions** with direct implications on our knowledge, which increases abilities to act adequately in various circumstances without being overburdened with information. Thus, the use of calm technology develops a pleasant environment.
  
- 3. Technological connectivity** enables a quick anchoring in certain circumstances against the background of a quick shifting from the center to the periphery of our attention, which determines a quick perception of the past, present and future of the subject. This characteristic leads to what Weiser and Seely Brown call "locatedness".

These characteristics are important features when enforcing calm data processing technologies. One example of increasing technological calmness is the use of liquid crystal display (LCD)

instead of cathode-ray tube (CRT). Using such technology has influences our attention, which leads to an increase of our ability to easily adjust to the environment.

## **Conclusions**

What would happen in our minds if we had to read a book with no table of contents? How attracted would we be to a book without pictures/figures compared to one having pictures/figures? How upset would we be if we had to read a paper without being able to visualize certain objects inserted in it? These questions/problems put our central and peripheral attention to the test, and lead to the following conclusions:

- a. The field of computer science tackles more and more types of data (text, sound, static images, dynamic images etc.). That is, it works with many different media with a minimum effort. This leads to a super-computer-assisted world where computers are ubiquitous in people's lives.
- b. Data processing technologies should calm down and induce calm, in other words be calm technologies. This is easily achieved if we take into account the multimedia aspect of data processing equipment and applications.

We conclude with the conviction that in a super-computer-assisted world we feel better when special emphasis is placed on the visual side of the means of communication or information/knowledge transfer, which is a multi-media presentation of the world we relate to. Moreover, if this makes using technologies less tiresome, then we will have the satisfaction of a "child playing at his work place".

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