



**THE TIME HAS COME
FOR STYLE AND FASHION
IN ELECTRONICS**

by Lance A. Glasser

"4:37," replied an electrical engineer as he consulted his nondescript black watch blinking off the seconds. He was, of course, right. He could have told us the time to the precise second if need be.

Form had followed function to produce a personal timepiece that was extraordinarily rugged and accurate.

Also ugly and cheap.

A group of us had gathered around the conference table of a large U.S. electronics firm to discuss the cutting-edge electronics technologies that are creating the future. But, curiously, the conversation turned to fashion and style.

We compared our wristwatches. As we went around the table we tallied a mixture of costly Omegas, plastic diving watches, and a few mid-priced time pieces.

There is a lesson here for the electronics industry. Despite the superior reliability and performance of the cheap, ugly watches, they are still just that: cheap and ugly. Their low price reflects their diminished perceived value to the customer.

The industry has an opportunity to do better. It is in the midst of a revolution that is putting unprecedented levels of information processing power in the homes, pockets, and appliances of consumers.

Like all revolutions, this one will require a new way of thinking.

At the heart of the revolution is an inexorable trend toward ever smaller and more powerful electronic devices poised to create huge markets for hand-size mobile information products.

Examples abound: hand-held navigation devices using signals transmitted by the Department of Defense's Global Positioning System (GPS) network of satellites, the shrinking personal computer that used to sit on your desk and now fits in the palm of your hand, mobile communications devices that have global reach, and health monitors and other biomedical devices.

This continuing trend in technology is reducing costs and improving reliability of these products to the point where they are both affordable and practical for consumers. The rate of innovation is tremendous and

competition is fierce; no one really knows what latent needs consumers have for information technology.

But whatever those needs are, consumers are not likely to pay much to have them satisfied. They only slowly increase the portion of their paychecks they spend on information technology.

That is not the way consumer markets usually work. Jewelry is not getting cheaper. What does a price/performance ratio even mean for art?

Since the new generation of personal information products is, by definition, aimed directly at consumers, variety is essential. We may all buy small products in large quantities, but we will not all want to buy the same small products.

As consumer electronics increasingly becomes the technology driver for electronics (replacing bombers and missiles of an earlier age) and miniaturization opens up new worlds of personal applications, aesthetics will determine which companies succeed and which fail.

All the companies will have quality; our present state of electronics technology guarantees that. They will also all be price-competitive. But only a few will produce masterpieces.

Those few will be the grand masters with name recognition. Some of the others will wind up in museums, where future generations of visitors will wonder at the historic aberration of ugliness of our time.

As electronics becomes a fashion industry, products will be differentiated by their style and design. This situation tends to fragment markets, creating fleeting market niches that last only a season. It also creates demand, an antidote to the profit-sapping effects of market saturation, but only for the products that meet the test of customer appeal.

And the electronics industry is not ready!

Dr. Lance Glasser is the Director of the Electronic Systems Technology Office at the Advanced Research Projects Agency, the principal research arm of the Department of Defense. He received his Ph.D. degree in electrical engineering from the Massachusetts Institute of Technology. He has written extensively on advanced electronic devices and computing technology, and is the co-author of *The Design and Analysis of VLSI Circuits*.