

Navigating the Nineties: New Waves in Technology and Human Resource Development



Koichi Nozawa, President

◇ We are experiencing a technological revolution in the 1990s as big as any in the past. We will see the effects in transferable designs, dramatic improvements in performance, and a new approach to training and educating personnel. The new field that will decide our future R&D efforts are mechatronics and firmware.

Mechatronics

One precision machine, the clock, reached an accuracy of 10 to 20 seconds per day after years of technological innovation. Electronics catapulted this precision to better than 0.02 second per day, a thousand-fold improvement. Electronics transformed the commercial value of the clock; it was more accurate, smaller, lighter, cheaper, and digital rather than analog. This opened up a huge number of new applications, including timers in pocket calculators, in cameras, and in household appliances.

In its early days, the novel digital readout was very popular, but sales later shifted back to the familiar moving hands. The electronic clock is an example of a new idea creating a temporary new demand but not altering the basic human preference for an analog display. If electronic clocks only had a digital readout, their applications would be more limited.

Mechatronics has fundamentally changed the mechanisms of printers, sewing machines, and many other products. It is increasingly important to train mechanical engineers to handle the electronic circuitry which is now so important to their work.

Firmware

The advent of the microprocessor, with all the power of a computer on a 10-mm square LSI chip, changed everyone's view of computer technology and how it is used. The computer was no longer something that only a large company with special expertise could build, or expensive, or so big it needed a computer room. Developing a computer used to need a huge investment, now a computer is an inexpensive component constantly finding new uses in electrical equipment and machines. There are microprocessors in washing machines, VTRs, and automobiles, often unbeknownst to users.

The microprocessor has revolutionized control circuitry, taking it from wired logic to a programmed sequence. The microprocessor revolution brought us standard and versatile microprocessors, and turned design know-how into software assets. This change cut development lead-time, and increased the added value of products a thousand times or more. Today's designer must be skilled with firmware. The microprocessor revolution promises a further leap driven by new applications of software assets. Human resource development in training personnel to use this software will be a key factor.

Our company has been part of this revolution for the last few years with our use of DSP technology.

In 1989, we created a sensation by introducing the world's first in-car sound field controller, the α 5000, which was built around a DSP sound processor. Our revolution was to convert an originally analog sound to digital. With a clear vision of future applications of DSP, we can create a further leap in business.

Technological breakthroughs are powered by a mix of new technologies. With revolutions happening now in bioengineering, micromachines, chaos, and many other fields, far-sighted human resource development will be vitally important to our work in the 1990s.



Koichi Nozawa
President