

Whetting our competitiveness

OF THE MANY actions required to respond to the challenge of the high-technology threat from abroad, none is more important in an era of fierce competition and scarce resources than better managing our own technology. Especially, we must increase our efficiency in creating and apply it.

A major means of accomplishing this is a vast increase in large-scale technological cooperation among corporations, universities and government.

If proof were needed, we can look to Japan's experience with its government-sponsored cooperative research associations. Perhaps the most dramatic example of success is the semiconductor research group that existed from 1976 to 1979. Its objective was to leapfrog U.S. technology in dynamic random access computer memory chips. The Japanese venture's success is attested to by the growth of its market share from 15 percent to almost 80 percent.

There was nothing unique to Japanese culture in the way in which the research association transferred the developed technology to individual members of the association. The same techniques are available to American industry.

Such technological cooperation offers many advantages to U.S. firms: Among them is the fact that a particular technology can be created for a cost less than that required for a group to create the technology by itself. As an example, I offer experience with the Microelectronics and Computer Co., which now has 20 member companies pooling resources for cooperative research and development in the U.S. computer and semiconductor industries. Control Data estimates that for each dollar invested, it will get results worth \$10: i.e., leverage of 10 to 1.

While it may be true that cooperative research programs can lead to compromised objectives that may meet an individual company's needs less precisely than desired, it can also result in greater insights concerning those needs. Many heads are better than one.

Cooperative research avoids duplicative work, allowing scarce resources to be applied to additional research. Furthermore, by taking more than one approach to a problem, risk of failure is lessened. And economics of scale are achieved by bringing together a critical mass of research personnel.

What is needed is the immediate formation of large-scale cooperative ventures in many more industries and fields so that MCC-sized gains in efficiency and innovation occur across the board to improve U.S. competitiveness. This is unlikely to happen unless partial federal funding is available.

One reason is the fragmentation that has occurred

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in cooperative activities. Most of the present technological cooperation in U.S. industry involves only a few companies and a university. A second reason is that fierce global competition is shrinking corporate profit margins, leaving less for research and development. Also, emphasis on short-term results to protect against corporate raiders has reduced funding for R&D. For example, Goodyear, in avoiding a takeover, doubled its debt, and the research and development budget was reduced by \$30 million.

Luckily, more large-scale technological cooperative efforts are being planned — three under the aegis of the Midwest Technology Development Institute and one by the Semiconductor Industry Association.

The Midwest Technology Development Institute was formed two years ago by nine Midwest states to expand technological cooperation among corporations, universities and governments to increase efficiency of R&D — and commercialization of results. Consortia are being formed in the areas of advanced ceramics and composites, making family farms more profitable, and advanced manufacturing.

The U.S. semiconductor industry has proposed formation of Sematech, a large-scale cooperative effort that has as its objective regaining and maintaining a strong competitive position in computer chips. A combination of federal and private funding is presently estimated at \$1 billion over five years.

Today's playing field is tilted in Japan's favor. Most of the correction will require U.S. government initiatives, and years will pass before much improvement is achieved. On the other hand, large-scale technological cooperation can be a private-sector initiative with the federal government in a supportive role.

The point is simply that there is a chance to help U.S. competitiveness in a major way through private sector actions that can be started immediately. We must decide to work together to encourage, plan and implement large scale technological cooperative programs when it is in the common interest to do so.

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