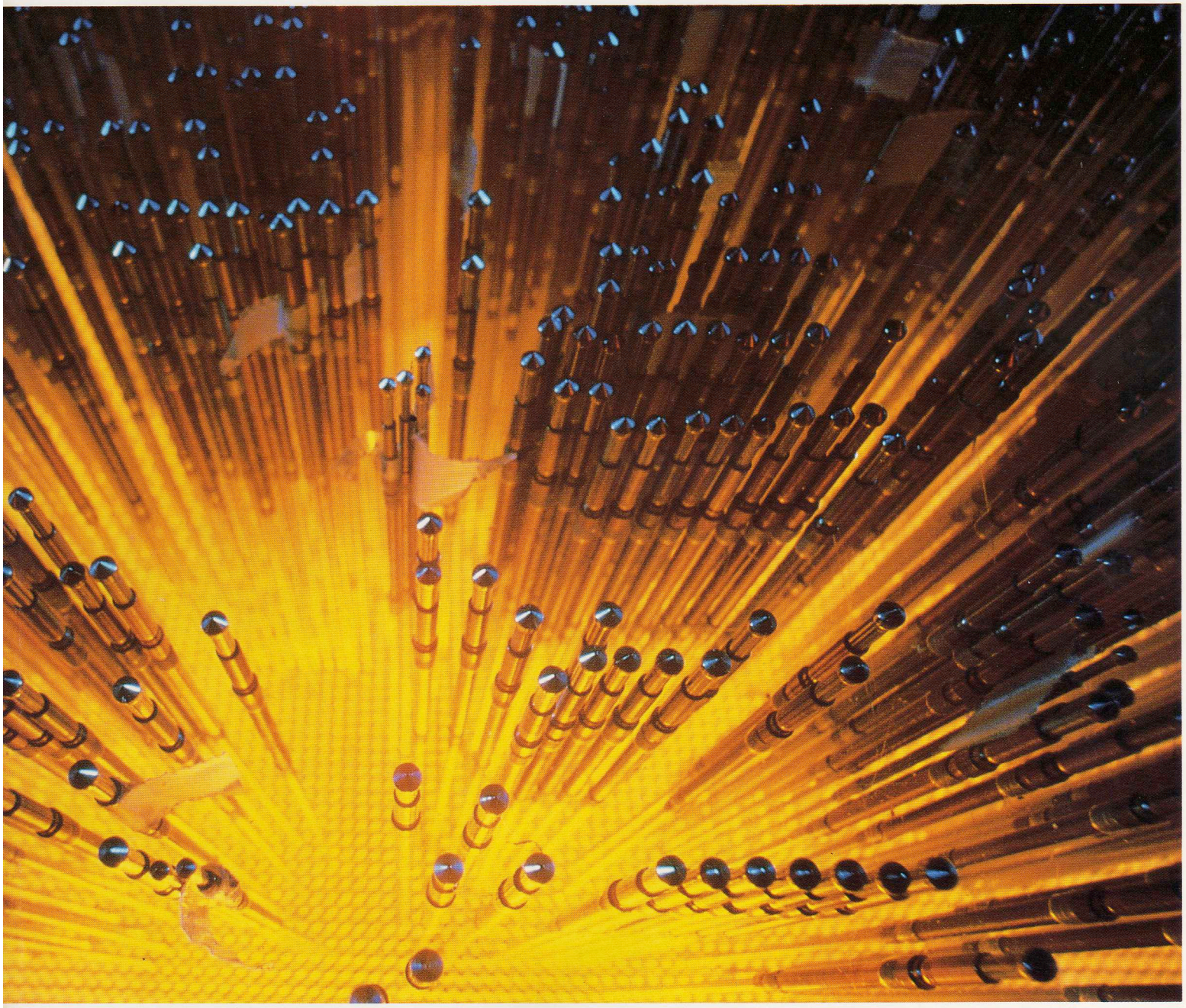
September/October 1988

PITTSBURGH HIGH TECHNOLOGY



Flexibility versus Structure: The High Technology Dilemma

Dr. Richard Florida and Dr. Martin Kenney

Editor's Note:
Increasing attention is being paid to what some analysts see as a central problem for American high technology industry: how to translate a breakthrough invention or process — what Professor Robert B. Reich calls a Big Idea — into marketable products and services. A case in point is anxiety over the slow pace of American firms, particularly in contrast to their Japanese counterparts, in capitalizing on research success in superconductivity.

This dilemma has caused analysts to reexamine differences in how the Japanese and U.S. high technology industries are organized: in particular, the respective roles of large Japanese companies versus the smaller, entrepreneurial firms that characterize U.S. high technology.

A recent front-page article in The New York Times summarized the central arguments in the debate between proponents on both sides of the small versus large company issue. On the one hand, some analysts claim that the U.S. approach leaves small American companies with insufficient resources to compete with the large Japanese companies that dominate such high technology markets as semiconductors. It also hampers the long-term research, investment, and management continuity of large U.S. companies by encouraging the exodus of talent to small, entrepreneurial firms, where the rewards for individuals are potentially greater in the short run.

In contrast, other observers point out that small American firms have succeeded in creating new products by applying new technologies that big companies virtually ignored (the personal computer being the prime example). While some analysts argue that small firms still provide the most viable channel for commercializing new technologies, others believe that industries such as semiconductors have matured to the point that large companies have a distinct advantage.

Cultural differences are also relevant, both between American and Japanese cultures in general and among the corporate cultures of each country's industries. In particular, some analysts claim that the American celebration of the individual entrepreneur or break-through inventor overshadows the need for structures that allow incremental innovation from individuals as part of a larger whole — the concept that Reich calls "the team as hero." Some point to Japanese success in this area.

There are also analysts who argue for new combinations of large and small. "Intra-preneurialism" allows large companies to create smaller enterprises within the organization, but free of the usual bureaucracy. The advantages of the large company (resources to conduct long-range basic research, and manufacturing and marketing capability) are combined with the virtues of the small (turning research discoveries into products with smaller-scale innovations and market-mindedness.)

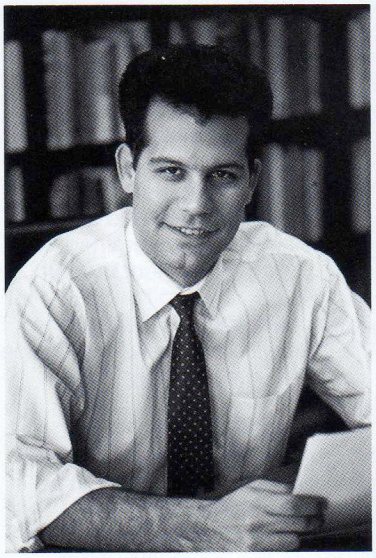
These and other issues are discussed in a study on high technology restructuring in the U.S. and Japan conducted by Richard Florida, Assistant Professor of Public Policy and Management, School of Urban and Public Affairs, Carnegie Mellon University, and Martin Kenney, Department of Agricultural Economics and Rural Sociology, Ohio State University.

Florida and Kenney begin with the premise that not only has the technology of industry changed, but so have the ways industry is organized. Older models of functionally specialized assembly-line production within a large, hierarchical organization no longer apply. The question is, what kind of organizational structure will work to insure American competitiveness in high technology industries, and especially in that critical area of turning Big Ideas into products and global market share?

Florida and Kenney looked at U.S. and Japanese high technology firms, paying particular attention to how large Japanese firms are able to dominate certain high technology areas. The following is an adaptation of their paper, presented recently to the Annual Meeting of the Association of American Geographers.

Japanese firms have caught up to the U.S. in a wide variety of high technology fields, including semiconductors, biotechnology, and automated manufacturing. According to a recent U.S. government report, Japan holds an unquestioned advantage in 12 of 25 important semiconductor technologies (the U.S. and Japan are even in nine others, with the U.S. leading in just two.) In 1984 alone, the U.S. high technology trade deficit with Japan was a staggering $16 billion.

Large diversified corporations play a central role in Japan's high technology industries. As the table below shows, six large Japanese electronics corporations — Fujitsu, Hitachi, Matsushita, Mitsubishi, NEC, and Toshiba dominate Japanese high technology. Market share ranges from more than 60 percent in integrated circuits to between 40 percent and 60 percent in computers and industrial automation. When other large firms such as Sony, Sanyo, Sharp, Casio, and Canon are taken into account, the market share



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