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Quality: The Competitive Strategy

In technology and innovation—long considered our trump cards in the international market—the United States is facing mounting competition from abroad. A declining percentage of high-technology exports and Japan's incursion into our semiconductor and consumer electronics markets are but two indicators of the trend. Scientists and engineers should be most troubled by our declining competitiveness. Our ability to fund R & D depends most heavily on success in selling the results of innovation—high-technology products.

Many factors contribute to the decline in the U.S. position. Among them are high interest rates and the strength of the dollar, the strained resources of our university systems, our sometimes outdated production processes, and the slowness of our public and private sectors to respond to strategies used by our international competitors. Many of these factors are related to public policy issues that must be addressed. Yet I think it important that at the same time we focus on a key factor that falls squarely within the responsibility of the private sector: the cost and quality of our products.

Historically, American industry has viewed quality improvement and cost control as separate and conflicting goals. Although this can be the case if quality improvements are made by implementing expensive test and inspection procedures, these goals need not be mutually exclusive. American companies are coming to realize that doing everything right the first time is a sound strategy for meeting our competition.

At Hewlett-Packard, for example, some years ago we analyzed in detail our methods and costs of achieving good product quality. We found that as much as 25 percent of our manufacturing assets were actually tied up in reacting to quality problems, and we decided that through pursuing quality we could achieve lower production costs and improve our competitiveness.

In the past 3 years, several experiments have been conducted to test this strategy. In our Loveland Instrument Division, aggressive goals were set to produce a voltmeter made with defect-free parts, processes, and design and to achieve just-in-time delivery. The result was that cost goals were met while, compared to the previous generation of the product, manufacturing cycle time was reduced by a factor of 10, inventory cut in half, and field failure rates cut by a factor of 3 to 5.

Our Avondale Division began its focus on quality at the design stage of a recently introduced high-performance gas chromatograph. The product requires two-thirds fewer parts and 60 percent less labor to manufacture than the one it replaced, the production cost was cut in half, and field failure rates are expected to be three to five times lower. The result is a product that is extremely competitive in terms of price and performance.

Our Japanese subsidiary, Yokagawa-Hewlett-Packard (YHP), was honored last year with the Deming Prize, Japan's highest prize for overall quality. The award recognized a 5-year program that reduced production costs by one-third and inventory by two-thirds, the length of the product development cycle by one-third, and warranty failure rates by more than half. During the 5-year period, YHP almost tripled its market penetration.

These examples show that pursuing quality is a cost-competitive strategy and that efforts to achieve quality must begin in the design phase of a product. Some of our greatest improvements have been the result of designers working closely on processes with people in manufacturing, on parts specifications with our vendors, and on applications needs with our customers.

In formulating a strategy to meet the competitive challenges we face, a logical first step is to take stock of our strengths. Science and innovation have made us leaders in high-technology markets, but we cannot remain competitive if others can duplicate our products and improve on the production process. In order to meet the challenge from abroad we must also focus on reducing the cost and improving the quality of the products we offer.—JOHN A. YOUNG, *President and Chief Executive Officer, Hewlett-Packard, Palo Alto, California 94303-0890*

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