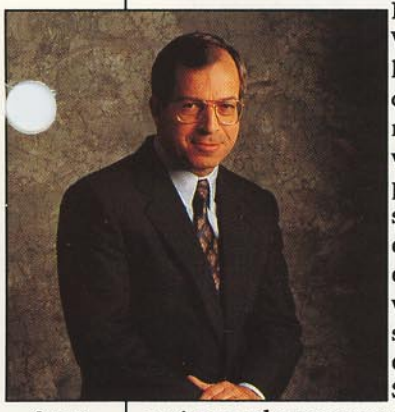
Six Sigma: 1992 and Beyond

Motorola's chief executive officers review progress toward Six Sigma and the expansion of our strategy for 1992 and beyond.

Dear Fellow Motorolans,

A decade ago, we began a journey that would determine the future of our company. The issue was survival; the challenge was quality; the solution would come from the people of Motorola. We didn't have a detailed map, but with unity of purpose, we set out to completely change the way we serve our customers. Since then, we've made some remarkable strides. In the United States, we were a winner of the first Malcolm Baldrige National Quality Award. In Japan, Malaysia, Europe and Israel, we have won quality awards against the toughest competitors in the industry. Throughout the world, the name Motorola has become identified with quality. We dare to dream of becoming the finest company in the world.



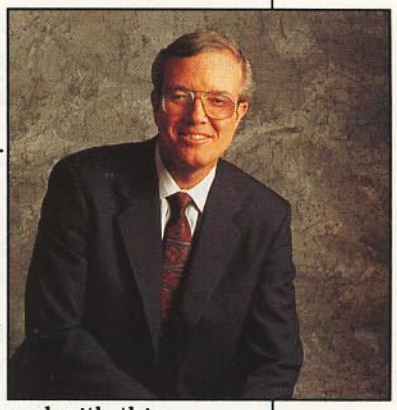
George Fisher

Today, quality remains a central concern in the global marketplace. During trade negotiations among heads of state, quality is an underlying theme. At Motorola, quality drives our quest for global leadership. It is appropriate at this point in our history to review our progress to date and our strategies for the future.

Halfway through the 1980s, it became clear that Total Customer Satisfaction must be our fundamental objective. To get there, we set forth five key initiatives, beginning with Six Sigma Quality and Cycle Time Reduction. Early in 1987, Bob Galvin, on behalf of the CEO and the Operating/Policy Committee, committed the Corporation to a quality goal of 10-times improvement by 1989, 100-times improvement by 1991 and Six Sigma capability by 1992. At that time, none of us knew how to achieve this Six Sigma goal. But, in our drive for perfection, we were committed to reach a defect rate of just 3.4 parts per million (ppm) in each step of our processes.

Accomplishments To Date. For the most part, we have met our goals of 10-times improvement by 1989 and 100-times improvement by 1991. At several Motorola facilities, we even exceeded Six Sigma capability in some products and processes. On average, however, our manufacturing operations are at about 5.4 Sigma capability, or 40 ppm — somewhat short of our original goal. Nonetheless, we have made very significant progress in improving the quality level of our products and services.

In getting to 5.4 Sigma capability, we have reduced our in-process defect levels by 150 times during the five-year period. We have improved the reliability of the products we ship to customers. And, we have saved a significant amount of the cost of manufacturing — $700 million during 1991 and $2.2 billion since the beginning of our Six Sigma thrust. In addition, we have achieved a number of significant improvements in our administrative functions by applying the Six Sigma methodology there as well.

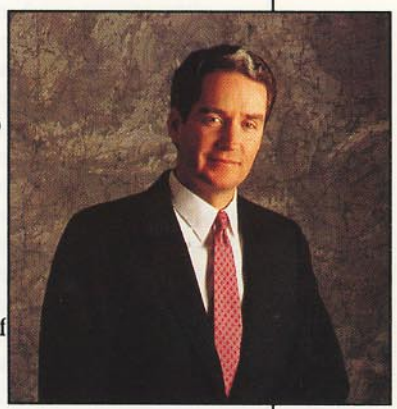


Gary Tooker

We are pleased with this progress, but we are also aware that our customers' expectations continue to grow and that the competition will never let us rest. In addition, we have not met our goals for profitability and return on net assets. We believe it is absolutely necessary to continue our quest for *Six Sigma and Beyond* results, seeking perfection in everything we do and leading to more satisfied customers and improved profitability.

Six Sigma Quality. It will take a major effort to meet and surpass this goal, company-wide. When we do reach Six Sigma, however, there is still room for improvement.

Some of you have pointed out that further improvements of current product quality may not be noticeable to our customers. While this may be true in the short term, the complexity of new technology



Chris Galvin

in the longer term will demand it. As product complexity continues to increase — such as semiconductor chips with

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billions of devices and trillions of instructions per second — it will be absolutely essential that we master the process of producing quality at a parts-per-billion level. (That's quite a challenge. One part per billion is equivalent to one second in 31 years!)

Therefore, the basis for our Six Sigma efforts in 1992 and beyond will be to:

- Continue our efforts to achieve Six Sigma results — and beyond — in everything we do;
- Change our metrics from parts per million to parts per billion (ppb); and
- Go forward with a goal of 10-times reduction in defects every 2 years.

Customer 'Satisfiers'. Motorola is engaged in a very competitive global marketplace. We will not grow if we continue to focus only on what we have done well in the past. We must conquer new areas of customer service and support — areas where we may not have always understood our customers' expectations.

A key factor here is the feedback we receive on the quality of our products and services. We need to understand this so well that we will be able to anticipate solutions to product and service needs our customers have yet to recognize. That means listening to their ideas about how we can better serve them from a total systems perspective — from idea introduction to successful delivery of a product or service.

Therefore, each business must develop customer-driven satisfaction indices — using factors established by the customer — and set aggressive improvement goals. These measurements will vary, not only across sectors and groups, but also by type of customer. They will also change in time when customers raise the bar as we meet their current expectations.

Cycle Time. While we have made dramatic improvements in manufacturing cycle time, particularly in the value-added portions, there are still enormous opportunities to improve cycle time in the non-value-added portions of our manufacturing and support functions. Such opportunities for cycle time reduction are often lost to view when we study processes segment by segment, rather than as a total business cycle.

We will develop indices and measure customer satisfiers in each business, then set and achieve aggressive goals.

Therefore, during 1992 and beyond, our cycle time reduction goal will be a 10 times improvement in 5 years, to make us truly world-class in time-based management. One of the most important applications of this strategy should be in the cycle time of our product development process.

Empowerment. It's clear that we will never achieve our goal of Six Sigma capability in everything we do without culture changes that empower Motorolans to better serve the customer. These may be individual contributors or members of high performance, self-directed, Impact and TCS teams. Or, they may simply be closer linkages among suppliers and customers. What they share in common is that each is taking responsibility to solve problems for the customer. They represent an exciting new spirit of initiative and enthusiasm on which to build.

We will apply cycle time reduction techniques to all elements of our business, with a goal of 10-times improvement in cycle time in the next 5 years.

With these new goals, we are planting the seeds for tomorrow's success:

- *Achieve Six Sigma and Beyond results in everything we do; strive for a 10-times reduction in defects every 2 years;*
- *Develop indices and measure customer satisfiers in each business, then set and achieve aggressive goals; and*
- *Apply cycle time reduction techniques to all elements of our business, with a goal of 10-times improvement in cycle time in the next 5 years.*

As you can see, we are embarking on a total systems approach — listening to our customers and responding to their needs with *Six Sigma and Beyond* capability and a commitment to every facet of total customer satisfaction.

Our goal is to become the finest company in the world. Let's make it happen!

George Fisher

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