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Malcolm Baldridge National Quality Award 1991 Recipient Solectron Corporation



A leading independent provider of customized integrated manufacturing services to original equipment manufacturers (OEMs) in the electronics industry, Solectron specializes in the assembly of complex printed circuit boards and subsystems for makers of computers and other electronic products. Solectron also provides system-level assembly services, such as assembly of personal computers and mainframe mass storage subsystems, as well as turnkey materials management, board design, and manufacturability consultation and testing. The firm focuses its marketing efforts on value-added projects requiring a high level of reliability and quality, rapid turnaround time, and responsiveness to change.

By focusing on customer satisfaction, exploiting advanced manufacturing technology, and stressing continuous improvement in operations and services, Solectron has demonstrated that high quality and high efficiency translate into low total costs and timely delivery. Solectron competes successfully with both strong international competition and also with the internal production capabilities of its customers. Indeed, major computer firms known for manufacturing

efficiency have closed internal assembly operations after determining that outsourcing the work to Solectron not only lowered costs but also improved quality. About 90 percent of new business is additional work from established customers. These customers have benefited from defect rates that have fallen to within the five-sigma range, or 233 parts per million, and on-time delivery rate of 97.7 percent over the last 2 years. Consistent with the goals of its major

customers, Solectron has committed to achieving and then surpassing Six Sigma quality in critical processes over the next 5 years.

SOLECTRON: A SNAPSHOT

Founded in 1977, Solectron has grown from a small assembly job shop with annual revenues of several hundred thousand dollars to an employer of 2,100 people who work at five sites in San Jose and Milpitas, California.

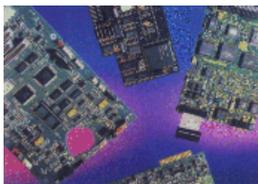
Assembly of printed circuit boards accounts for about 80 percent of business, with the remainder divided among assembly of other electronic systems, subsystems, software packaging, disk duplication, remanufacture of customer products, and design and testing services. Solectron operates one of the world's largest surface mount facilities for the assembly of complex printed circuit boards and subsystems.

Among its some 60 customers are manufacturers of personal computers, workstations, disk and tape drives, and avionics, medical imaging, and telecommunication equipment. Some of these firms supply Solectron with all components for assembly into the finished product. An increasing number of customers, however, rely on Solectron to procure some or all components, thereby reducing their investment in inventory, facilities, and personnel.

CUSTOMER NEEDS DRIVE RESULTS

As a contract manufacturing company, Solectron does not compete with its customers in designing and marketing products. Although it offers an original equipment design service, more often it manufactures a product designed by the customers. Solectron competes on the basis of service, quality, and cost, and the company goes to great lengths to determine how existing and prospective customers define superior performance. Besides conducting exhaustive searches for information on customers, competitors, and markets, Solectron has developed several mechanisms for ensuring direct and frequent feedback from customers. One of the most valuable is a weekly survey of all customers. The results are compiled into a customer satisfaction index, which CEO Dr. Winston Chen and other top executives review at one of their three weekly meetings on quality-related issues. The survey information also is used to grade the performance of each of Solectron's nine major divisions. Within the company, a similar system is used to evaluate the performance of specific work groups and departments in meeting the needs of their internal customers.

At Solectron, the concept of Continuous Improvement is a cultural strength. The company has a strong top management team on a crusade to revitalize American business through quality. The executive team sets corporate quality targets and then works with teams to set supporting goals in each functional area of the company. They have relied upon several strategies that give them a high-energy, customer-focused work force. These strategies, which include a strong "family" orientation, an effective communication system, and an innovative reward and recognition program, have held the organization together through rapid growth. The management style is participative with a high degree of coaching and autonomy. Solectron has a team-focused approach to employee involvement, which relies on training and mentorship to overcome barriers due to a multilingual work force composed of workers from over 20 cultures.



Each Solectron customer is supported by two teams that work to ensure quality performance and on-time delivery. A project planning team works with customers in planning, scheduling, and defining material requirements and lead time. A total quality control team meets weekly for monitoring and evaluating production with the aim of preventing potential problems and identifying ways to improve process yields.

“WE ARE THE BEST... AND GETTING BETTER”

"WE ARE THE BEST . . . AND GETTING BETTER"

Solectron's comprehensive information system, organized in a customized relational data base, enables regular -- often real-time -- surveillance of internal quality performance and process control indicators. Key performance data are charted in all departments, and workers, most of whom are trained in statistical process control and problem-solving methods, are empowered to make process improvements and take corrective actions.

Statistical Process Control (SPC) is used regularly in all departments. SPC charts track performance of each machine with measurements recorded in an SPC data base. Division quality managers and the corporate quality director track and review results daily. Since 1987 the average product rejection rate has improved to better than 0.3 percent of shipments, a 50-percent improvement.

Upstream from its assembly operations, Solectron works with suppliers to improve the quality and reliability of their operations. As it does with its customers, the company views its suppliers as partners in pursuing Six Sigma quality, and it offers training and other technical assistance to help them continuously improve.

Investments in advanced technology are guided by Solectron's evaluation of its customers' future requirements and top management's emphasis on enhancing manufacturing capabilities. The company was quick to adopt "surface mount technology" (SMT) that, unlike the conventional method, permits integrated circuits and other components to be placed on both sides of a circuit board. Although requiring higher levels of capital investment and assembly expertise, SMT

offers the advantages of increased packaging density and improved product performance. Solectron now has 19 surface mount assembly lines, and it is developing new bonding and soldering methods to exploit the advantages that SMT offers customers.

Solectron's quality improvement efforts are paying off, as indicated by its chief indicator: "customer satisfaction." It has won 37 superior performance awards over the last 10 years, 10 of those in 1990. After a recent quality audit, a major customer rated Solectron as the "best contract manufacturer of electronic assemblies in the U.S."

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Date created: 08/27/2001

Last updated: 04/27/2012
