

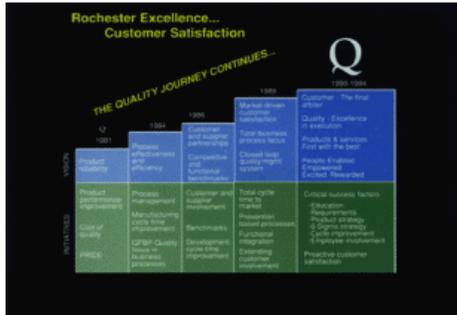
## Baldridge Performance Excellence Program

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## Malcolm Baldrige National Quality Award 1990 Recipient

### IBM Rochester - AS/400 Division



The concept of quality at IBM Rochester is linked directly to the customer. Detailed features are crafted by analyzing the needs and expectations of existing and potential owners of the computer hardware and software manufactured by the Rochester, Minn., site of the International Business Machines Corporation. At every step, customers are directly involved in each aspect of the product from design to delivery -- through advisory councils, global information systems, trials of prototypes, and numerous other feedback mechanisms.

The IBM Rochester quality culture has been transformed from reliance on technology-driven processes delivering products to market-driven processes directly involving suppliers, business partners, and customers delivering solutions. A 30 percent improvement in productivity occurred between 1986 and 1989.

Product-development time for new mid-range computer systems has been reduced by more than half, while the manufacturing cycle has been trimmed 60 percent since 1983. Customers have benefited from a threefold increase in product reliability; an increase from 3 to 12 months in the product warranty period; and a cost of ownership that is among the lowest in the industry. IBM's share of the world market for intermediate computers increased in both 1988 and 1989.

#### IBM ROCHESTER: A SNAPSHOT

IBM Rochester manufactures intermediate computer systems -- currently the AS/Entry Systems and the Application System/400 (AS/400). More than 400,000 IBM Rochester systems have been installed worldwide. This location also makes hard disk drives, which are electromechanical devices that store and retrieve information on magnetic disks. Sales of hard disk drives accounted for about a fifth of IBM Rochester's revenues in 1989.

IBM Rochester provides employment to more than 8,100 people and is responsible for product development and U.S. manufacturing. In addition, its processes are implemented in plants located in Japan, Mexico, United Kingdom, and Italy.

#### "ROCHESTER EXCELLENCE ... CUSTOMER SATISFACTION"

IBM Rochester recently strengthened its strategic quality initiatives by formulating improvement plans based on six critical success factors: improved product and service requirements definition, an enhanced product strategy, a six-sigma defect elimination strategy, further cycle time reductions, improved education, and increased employee involvement and ownership. Each senior manager "owns" one of the six factors and assumes responsibility for plans and implementation. Progress toward achieving improvement goals is closely monitored. Support processes are a part of this network.

The continuous improvement of support processes at IBM Rochester rests on aggressive worldwide benchmarking, a process that analyzes products and services to determine the best of the breed in all industries. Over 350 teams are in place to work on opportunities. Scores of benchmarking studies have been completed.

Quality goals are established in five-year business plans and annual operating plans. Strategic targets are derived from its comprehensive benchmarking process. With the aid of financial planning models and mathematical decision-making tools, quality priorities are set, and the resources -- human and capital -- necessary to carry out these priorities are determined.

Most plans for achieving quality objectives originate with employees, and cross-functional teams identify needs for equipment, staffing, education, and process development. Each quality improvement plan has an owner -- a managerial or non-managerial employee who heads the project team. With employee input, objectives and requirements are established for each employee, and a measurement system for monitoring progress is developed in advance of the project. Close coordination and efficient communication are ensured through regular planning meetings, in which key suppliers and customers participate.

IBM Rochester invests heavily in education and training, the equivalent of 5 percent of its payroll. Employees, supported by IBM's tradition of full employment, are encouraged to develop the skills and expertise for a variety of jobs. In 1989, about a third of the work force moved into new positions, and 13 percent were promoted. IBM Rochester is implementing a Management System for Education, which will offer skill planning, needs assessment, individual education plans, and education road maps on-line. Job flexibility and security, ample opportunity for advancement, and a well-developed recognition process are among factors contributing to rates of absenteeism and turnover that are well below national averages. Employee contributions to quality improvement are recognized in a variety of ways, including luncheons, receptions, and monetary and non-monetary

awards. Morale is high, as determined in IBM annual surveys, and by an independently conducted survey that compares levels of worker satisfaction at 34 U.S. companies.



Equipping workers with the tools and information they need to accomplish quality and customer satisfaction objectives is also a priority. Over 11,000 on-line terminals provide employees with worldwide access to extensive communication capabilities, databases, and design and analysis tools. For example, since 1986, IBM has invested more than \$300 million in improving its processes and information systems. Such investments, many of them designed to improve problem-solving capabilities ensuring that defects are prevented rather than detected after they occur, have paid for themselves. Capital spending on equipment for defect detection declined 75 percent during the 1980s, and write-offs as a proportion of manufacturing output dropped 55 percent.

At the start of the product planning process, suppliers are included as partners to ensure that new hardware and software will achieve IBM goals for manufacturability, serviceability, reliability, performance, and cost. Accounting for about 30 percent of production output, IBM Rochester's approximately 700 production suppliers are expected to provide defect-free shipments and to keep pace with its progress in improving quality and reducing development and manufacturing cycles. Suppliers are trained, audited, and certified, and they are required to submit quality plans. IBM Rochester shares its own state-of-the-art technology with suppliers and, in turn, suppliers provide valuable expertise to IBM. Since 1984, IBM Rochester employees have instructed more than 1,000 supplier employees on continuous flow manufacturing, statistical process control, and design of experiments.

The Rochester quality process is a continuous loop that begins, ends, and begins again with the customer. Of the approximately 40 data sources analyzed to guide improvement efforts, most either provide information on customers' product and service requirements or guide steps to refine these expectations into detailed specifications for new IBM offerings. Customers are also active participants. For example, customers and business partners representing over 4,500 businesses worldwide participated on customer advisory councils throughout the development of the AS/400.

To strengthen its competitive quality position, IBM Rochester is aiming for a tenfold improvement in key quality areas by 1991, a hundredfold improvement by 1993, and a six sigma level of defects by 1994.

**Baldrige Website comments:**

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