Session Investigates Design and Manufacturing

By Eva Moy

Industry is increasingly recognizing the success of concurrent engineering and implementing its use in design and manufacturing, which span most of the product development process. Two of the sessions at the Industry Session last weekend addressed this issue, "Design: The Next Imperative of Industrial Competitiveness" featured panelists Woodside C. Flowers PhD '73, professor of mechanical engineering, G. Glenn Gardner, general manager of large car platforms engineering at Chrysler Corp., Peter G. Lawrence, chairman of Corporate Design Foundation, and Session Chair Thomas L. Maguire, professor of management science and co-director of the Leaders for Manufacturing Program.

Sloan Professor of Management and Leaders for Manufacturing Professor Arnoldo C. Hax led a session on "Emerging Best Managerial Practices."

"Human and organizational development approaches such as greater employee empowerment, reliance on autonomous teams, and flattened organizational structures are as key to enabling process change as any technical tool," Hax said. "In fact, information technology is rarely effective without simultaneous human innovations."

"As work becomes more participative and team-oriented, this distinction between manager and non-manager begins to fade," he said.

Customer needs must come first

"The product is the object at the intersection of the company and the user," Lawrence said.

A company must "operate as if the final customer ... was the only focus of the team," with personal and company goals given lower priority, Gardner said. "The customer is always the one at the table with you."

Chrysler needed to make changes in its corporate structure to survive, much less compete. Gardner said. He described the "LH" team at Chrysler that experimented with a platform team design structure to increase competitiveness.

The team rejected the "throw-over-the-wall" approach, where each section of the company works independently. Instead, it brought together suppliers, design, engineering, manufacturing, and marketing sections from the beginning, he said.

Individual members had their own goals, responsibilities, authority, and plans for profitability. Non-critical items, such as briefings and coordinators, were removed from the critical path. The technical level, not managerial level, now made the decisions, Gardner said.

The LH team reduced the development time from 4.5 to 3.5 years and took money from 14000 to 741, representing a savings of $42 million. The overall product came under under $20 under target, and had better fuel economy. Lawrence also emphasized concurrent education, citing programs at MIT such as the class Design Projects (2.73), the Leaders for Manufacturing Program, and the New Products Program.

Designers use tools such as the House of Quality and Quality Function Deployment, which correlates customer demands with engineering attributes. Using computer aided engineering and computer aided design, parameters can be changed and redesigned with a single keystroke.

Even with this technology, designers still need to consider tradeoffs between analysis and testing, risk and comfort, and method and form, Flowers said. Manufacturing engineers also need to consider cost, quality, speed, and flexibility at the manufacturing processes, Hax said. It is "more costly to do things wrong than do things right," Hax said.

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