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From the December 13, 2002 print edition

UWM-affiliated center enlightens firms on equipment maintenance

Becca Mader

Executives at Citation Custom Products in Menomonee Falls know that one of the biggest challenges the manufacturer faces is the prospect of its tools and equipment breaking down.

Equipment repairs and the resulting downtime can hurt productivity and profitability, said David Schuckert, Citation Custom Products' quality training manager.

"If you increase the tool life, you are not spending as much on tools or downtime," he said.

Seeking to address equipment maintenance concerns, Citation Custom Products is working with the Intelligent Maintenance Systems Center in Milwaukee. The 2-year-old research center is developing and testing technologies and products to help manufacturers improve their strategy on equipment maintenance.

The center, located at the Cozzens-Cudahy Research Center on Milwaukee's northwest side, is run by the College of Engineering at the University of Wisconsin-Milwaukee and the University of Michigan in Ann Arbor.

The center's goal is to give manufacturers and service-sector firms a competitive advantage by developing Web-enabled products and tools to help companies achieve near zero downtime. The center's directors believe that can be achieved through the use of equipment monitoring — assessing degradation of equipment and preventing breakdowns.

"We would like to see Wisconsin companies understand that, by using this emerging technology, they will improve productivity," said director Jay Lee, UWM's Rockwell Automation professor, an endowed position. "It is the only way I believe our companies can compete."

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The Milwaukee-based maintenance center is one of the National Science Foundation's 50 Industry/University Cooperative Research Centers nationwide. The directors applied for that distinction and received it in April 2001.

With a little under two years of experience, the center is still in its infancy and spreading the word on its mission.

"The challenge is how do you make a good percentage (of companies) aware of what's available?" said Charles Carter, vice president of technology for the Association of Manufacturing Technology, a trade association in McLean, Va. "It has to be presented in a way that is easy for them to assimilate."

Slow adopters

The manufacturing industry also is "somewhat slow to adapt new technology at times, especially preventative maintenance," said Schuckert of Citation.

But manufacturers participating in the maintenance center "realize the value and see what we have accomplished," said Jun Ni, the center's co-director at the University of Michigan. The center started with 20 companies but has grown to 45. Member companies have promoted the center by word of mouth, and it has been featured in various business publications, including Fortune Magazine.

Maintenance is a key issue, especially as equipment becomes increasingly complex, said Carter.

Though maintenance is an age-old concern, it hasn't been addressed as seriously in the past, Ni said. Too often the focus is on a "fail and fix" mentality, Lee said.

Recent developments in technology have helped bring maintenance-tracking processes to the forefront.

"Every company needs this," Lee said. "When a machine goes down, the downtime costs are more than machinery costs."

With Milwaukee's rich manufacturing history, both directors believed the city is the right spot because "if we wanted to make something big happen, we have to go to the right location," Lee said.

The National Science Foundation provides about \$130,000 per year in funding, plus additional grants to the maintenance center. Milwaukee-area manufacturers partner in the center to create the financial backbone for most of the center's research projects.

Big names

Members include Rockwell Automation, the U.S. Postal Service and Johnson Controls Inc. Such high-profile participants signal that "the center is doing industry-relevant research that can generate return on investments for companies," said Alex Schwarzkopf, director of the Industry/University Cooperative Research Center Program for the National Science Foundation in Arlington, Va.

A full member pays an annual fee of \$35,000 while an affiliate member, typically with 500 employees or less, pays \$10,000. The universities cover overhead costs.

Every six months, through the center's Industrial Advisory Board, members review project results and choose which projects the center will pursue next.

The center researches and tests products and has about six or seven in the works, Lee said. Its Watchdog Agent, for example, can be embedded in machinery and acts as a digital doctor, assessing a machine's health and alerting managers of changes or degradation via the Internet.

"The holy grail as far as manufacturing is concerned is zero downtime," said Howard Mars, director of marketing for a unit of Rockwell's Global Manufacturing Solutions, a consulting and services division. The center "is shining a light in the

direction we want to move."

The center tests its technologies at both universities as well as at member companies such as Citation Custom Products. The center does not sell the products; however, member companies have the opportunity to use them.

Lee said the ultimate goal is to cultivate start-up companies that make and sell products and technologies for the commercial market.

Through some of the center's offerings, Citation has extended its average tool life by 35 to 40 percent, which has provided cost savings and allowed the production of more parts per direct labor hour, Schuckert said.

Citation Custom Products is a 500-employee company that machines auto and truck brakes, engine and drive train components and other items. Citation is using a system that will give it real-time feedback about how its machines are running. It allows the company to make adjustments if necessary without stopping the process, Schuckert said.

The center's technologies will enable companies to keep a better life history of their equipment, which will help them make better decisions about maintaining it, Carter said.

The leaders of the center hope to recruit more manufacturers in the Great Lakes area as well as governmental agencies.

"To us, they are a natural resource for research in the manufacturing industry," said Mars of Rockwell. "We see (it) as a clearinghouse and it serves the natural interests of private industry and academia."

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