Snap-on Tools project filled with surprises, mutual benefits

A recent partnership that CIRAS arranged between Snap-on Tools in Algona and an Iowa State industrial engineering class resulted in a slew of pleasant surprises, from the possibility of significant savings for the manufacturer to real-world learning experiences for the students. The collaboration was an eye opener for CIRAS as well.

“I was surprised that Snap-on wanted our help,” says CIRAS account manager Bob Coacher. “This place is well organized and flowing well. It’s a company on the leading edge. I realized that they wanted to provide an opportunity to other manufacturers and students to learn from them.”

Based in Kenosha, Wisconsin, Snap-on Inc. manufactures an extensive cadre of tools; its Algona subsidiary produces high-end, custom-made rolling tool cabinets for industrial and automotive use. The signature red tool cabinets, which also come in an array of colors, even pink, are popular with NASCAR mechanics. Snap-on’s Algona plant has about 300 employees, making it the largest employer in the area.

In spring 2007, plant manager Scott Marienau contacted Coacher, who had visited the plant previously while making the rounds in his region. Snap-on employees’ former experiences with Iowa State and their commitment to continuous improvement made Marienau wonder if Iowa State could help the plant become more efficient.

“Our facility here is very open to ideas to make our jobs better,” he says. “We have a great attitude in the plant.” Despite the workers’ openness, Marienau wasn’t sure what Iowa State could provide and if anything concrete would come from a cooperative effort. But Coacher, who regularly works with Iowa State’s College of Engineering, had an idea to match Snap-on with Iowa State resources that would improve the company’s competitive position in the marketplace.

Subsequently, 29 students in Iowa State lecturer Leslie Potter’s senior capstone design course (IE 441) in the Department of Industrial and Manufacturing Systems Engineering devoted their fall 2007 semester to problem solving for Snap-on.

The class divided into seven groups, based on project ideas that Marienau had supplied after receiving input from Potter, who had observed operations at the plant. The students spent the rest of the semester traveling between Algona and Ames to arrive at specific solutions, culminating with a presentation to Snap-on management in early December.

“Senior design requires a very comprehensive approach because we ask the students to pull all they’ve learned together,” Potter explains. “It’s a huge mental exercise for them. It can be completely frustrating, and it takes an inordinate amount of time. It’s one of those things that you love yet find terribly difficult at the same time. We’re trying to make this as close to the real world as we can.”

Beth Takemoto, whose team earned second place in the presentations and received an “A” for the semester, agrees that the project was labor intensive but rewarding. “It was the hardest class during my time at Iowa State and required a lot of time, but it was worth it,” she says, estimating that she spent about 40 hours a week on the class and traveled each week to Algona, a two-hour drive north from Ames.

Her team evaluated how Snap-on could reduce the amount of setup and changeover time on the Dreis and Krump stamping press—the factory’s largest metal sheet press. The design team’s goal was to reduce the setup time by about 80 percent, from 45 minutes to 10 minutes.
Takemoto and her classmates were able to decrease the setup time to 12 minutes. They sped up production by using a process called SMED, or single minute exchange of die. The process involves identifying steps as internal, those that can be done with the press off, and external ones that can be accomplished while the press is running.

“The goal of this process is to eliminate any unnecessary tasks and move as many internal tasks to external in order to make the best use of the operators’ time,” she explains.

This college senior’s experience verified that Snap-on employees are receptive to change, even though the average worker has been on the job for more than 30 years.

“I have never worked with a company where the workers are so willing to try any change,” says Takemoto, who has spent her summers as an intern at another Iowa manufacturing plant. “They were willing to try whatever method we put out there. I had a great time working with them.”

The other six teams tackled a multitude of projects, namely resolving defects in the powder coat line, reducing setup time on other presses, increasing the hanging of painted parts, evaluating products that require rework, and examining the daily plant schedule.

“I don’t know if I had a unique group, but we received a lot of neat stuff—practical stuff—from them,” Marienau says.

“It’s all about helping companies improve processes,” Potter adds. “We helped Snap-on find more time to run parts and less time being down, getting machines ready to go. It’s about making things move more efficiently. It’s not busy work. It has to be about design.”

Of course, the ultimate test for a manufacturer on whether a pilot project is successful relates to money, no matter how the employees feel about the people involved. “My staff and I were impressed with the kids themselves. They knew the questions to ask,” Marienau says. “I thought they were very innovative. We actually came away with dollar savings from this experience. I hope the kids are the better for it. We gained and they gained.”

At this point, Marienau says the plant hasn’t been able to implement the students’ suggestions because Snap-on is in the middle of a major plant renovation and 51,000-square-foot expansion. CIRAS records the impact of the project on completion and a year later, Coacher says.

The delay in implementing her students’ ideas doesn’t disturb Potter. In fact, she says that’s something these future industrial engineers should expect. “I help the students understand that no matter how amazing their recommendations are, companies have lots of irons in the fire,” she says. “They have to write a project in such a way that the manufacturer can put it in a desk, pull it out six months later, and still be able to implement it.”

Both Marienau, who has been the plant manager for four years, and Potter, who is in her eighth year of teaching, consider the alliance with CIRAS to be a natural one and a partnership with plenty of potential. Potter believes “it makes a huge amount of sense for us to be working with CIRAS” because Iowa State then can offer more to manufacturers throughout the state.

According to Marienau, “CIRAS has untapped resources—things available that I haven’t even asked the right questions for yet.” He is so enthusiastic about the outcome of this alliance that he already has arranged to have the 2008 senior capstone design course concentrate again on Snap-on.

“Tell Leslie (Potter) that we want another excellent group,” he says. Perhaps all the players deserve an “A” for their role in this partnership.

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