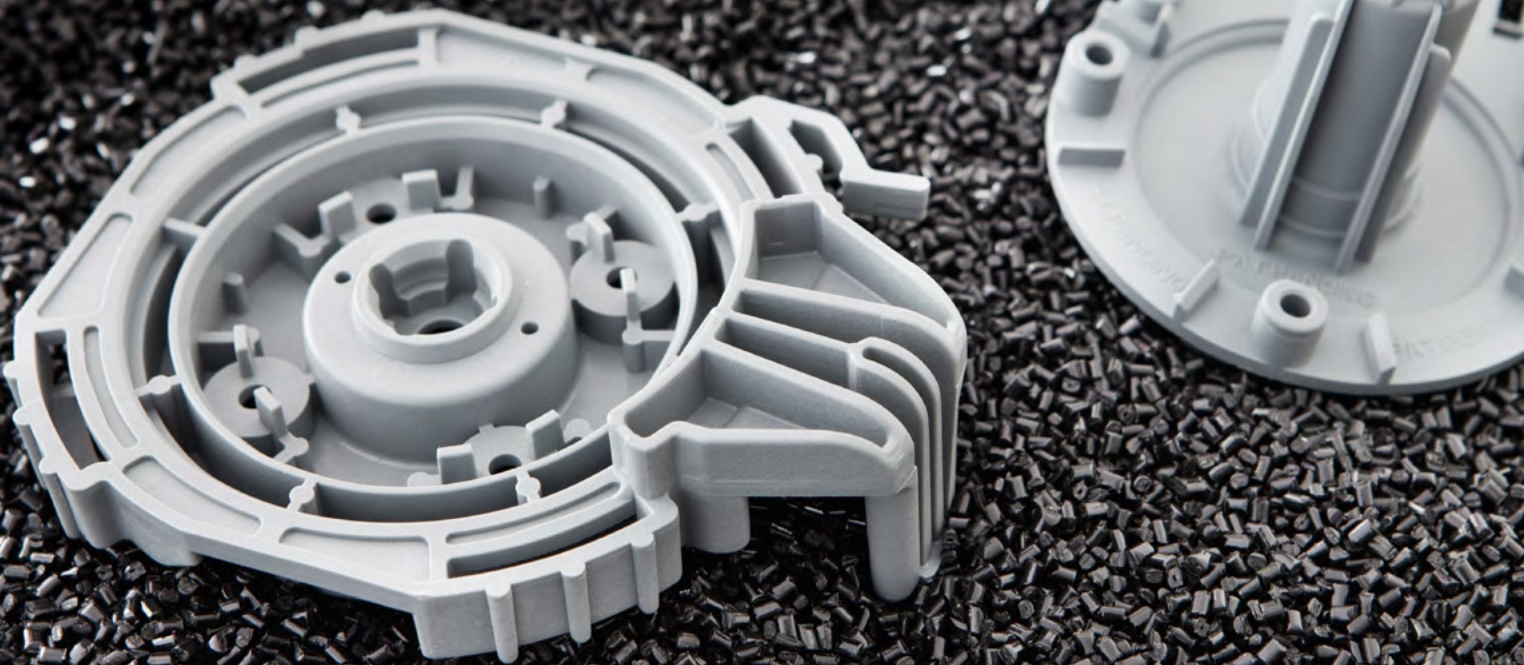


PLASTIC COMPONENTS DELMIAWORKS HELPS SET THE LEADING EDGE OF AUTOMATED MANUFACTURING

Case Study



Overview:

Based in Germantown, Wisconsin, Plastic Components, Inc. (PCI) is a globally competitive, low-cost producer of critical injection molded thermoplastic parts for original equipment manufacturers. Since 1989, the Wisconsin based company has relied on complete process automation to provide the highest quality parts at the lowest possible cost. With 40 dedicated manufacturing cells (presses, robots, parts conveyors and automated material handling systems) producing parts on a fully automated basis 24 hours a day, five days a week, PCI has shipped over one billion molded parts to customers throughout North America since its inception in 1989.

Germantown, Wisconsin-based Plastic Components, Inc. (PCI) is a world-class injection molder of plastic parts. The company has established a reputation as a visionary manufacturer because it runs fully automated facilities: no direct labor is involved in their manufacturing process. In fact, their newest facility that literally runs “lights out” has received a patent for its design.

“Right now, we have 60 fully automated molding cells that can run 24 hours a day, seven days a week,” says Tom Duffey, president and owner of PCI. “The cornerstone of our operation, what I call the ‘nervous system’ that keeps everything running the way we want it to, is our enterprise resource system (ERP) from IQMS.”

From Spreadsheets to Special Performance

At a little over a decade into their development, PCI’s information system was a potpourri of Excel spreadsheets, Access databases, and legal pads with pencils. “We didn’t have a good handle on production scheduling, inventory, and true manufacturing costs,” says Duffey.

To address this situation, PCI conducted an assessment of a number of ERP systems, including DELMIAworks (formerly IQMS). PCI committed to DELMIAworks’ Manufacturing ERP, and spent nine months getting ready for implementation.

“We worked very closely with the DELMIAworks team to go through the preparation process,” recalls Duffey. “From that point to where we are now, we’ve grown by a factor of 10, from \$3 million to \$30 million annually in sales. There’s absolutely no question that we never could have achieved that without IQMS.”

Supporting Advanced Automation

According to Gene Mussel, operations manager at PCI, DELMIAworks supports the sophisticated automation the company instituted. “That level of automation allows us to set up the process and the job, then run for prolonged periods of time,” he says. “We’re able to consolidate the scheduling function into a single role, in which one person is able to schedule 60 machines, 10 to 15 setups per day, as well as all the raw material requirements needed for the day, week, or month for that run.”

PCI leverages DELMIAworks from the minute a sales order is entered, typically by EDI through a customer’s ERP system directly into DELMIAworks. “Instead of having anyone punch keys to enter a sales order, we can pull that data directly from IQMS, which reduces labor and the likelihood of error,” notes Mussel.

Once the order is received, the schedule runs updates through DELMIAworks—a single scheduling function that recalculates demand. “The system builds the buckets and work orders for every job we have, and determines when raw material is needed based on run times and must start dates from the customers; all the functions are scheduled

Return on Investment

- 60 fully automated manufacturing cells running “lights out” 24/7
- Consolidated the scheduling function into a single role
- Detailed visibility into the profitability of each part produced
- Growth by a factor of 10
- More efficient use of resources

on the floor,” Mussel continues. “It defines exactly how many hours a sales order will need, and allows us to queue up the job that will follow; so we can schedule out four weeks or more, including forecasts from customers for material demands. On a day-to-day activity basis, it tells us what needs to be running, what’s going to be scheduled tomorrow, what materials need to be received and on-hand for that schedule to function appropriately, and most importantly, what future orders the scheduler needs to enter for the variety of raw materials we will need.”

PCI’s complexity ratio is high: they have about 300 active individual part numbers, 120 active resins, and 60 machines. DELMIAworks provides PCI the functionality and planning to manage this complexity and direct operations, and does so with very limited input from PCI personnel.

“Typically, in a company of our size, the functions above would be done by four to six people,” notes Duffey. “In our organization, there is one person who manages it all. This is a direct result of the use of IQMS. There’s no way you can do what we do, with the level of complexity involved, without a fully embedded, effective information system. That’s what IQMS provides us.”

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Facilities that Facilitate Growth

A big part of PCI’s recent growth results from adding a second manufacturing facility. PCI’s original location is on Morse Drive: a 10,000-square-foot facility that was expanded to 38,000 square feet, completed in 2005. “In 2011, we were approaching full capacity of the

original facility," says Duffey. "We knew we had to find additional production space/capacity in another location. The facility we found was a 15,000-square-foot building just a couple of blocks away on Bunsen Drive, in the same industrial park. We purchased the building and hollowed it down to the cinder block walls. Then we designed and built a manufacturing facility that could literally run 'lights out.' Gene and his operations team created a facility so unique it was awarded a patent. We have just completed a 23,000-square-foot expansion to that facility, continuing to build the 'lights-out' concept after four years of success."

"In order for us to run and manage that facility, we need to be directly connected with what is going on; IQMS allows us to know on a second-by-second basis the status of all the machines that are running in both facilities," Mussel adds. "We know, immediately, any machine status. The system is continually counting down when a job is going to be done, so we can schedule the next job in position."

Incredibly, that's one desk in one office running multiple facilities, providing the company tremendous scalability. "There's no way we could do the amazing level of automation at Bunsen Drive—lights out, no direct employees at that facility on an ongoing basis, and 90 percent of the time there is literally no one in the building—without the full and effective use of our ERP system," reports Duffey. With DELMIAworks, PCI personnel can see on the real-time screens in their offices exactly what is going on in both facilities every minute of the day. "We would be flying blind without IQMS."

The Power of Automation—and Information

Particularly key to manufacturers like PCI has been the development of the Internet of Things (IoT). The Internet of Things is one of a handful of technology areas that are set to drive growth and innovation. A big segment of the Internet of Things is data collection and factory floors like the one at PCI already excel in that area. Through highly connected IP networks, companies such as PCI can now connect outward at the enterprise level. DELMIAworks' RealTime Process Monitoring solution, for example, is a two-way communication system that operates using IP-based connectivity. Through PLCs, DELMIAworks' Process Monitoring solution can connect to any device on the shop floor to exchange information, control parameters, and monitor production in real time.

It is this type of forward-thinking by DELMIAworks that Duffey cites as adding special value to his organization: by providing the ability to provide real-time utilization data and detailed information on parts profitability.

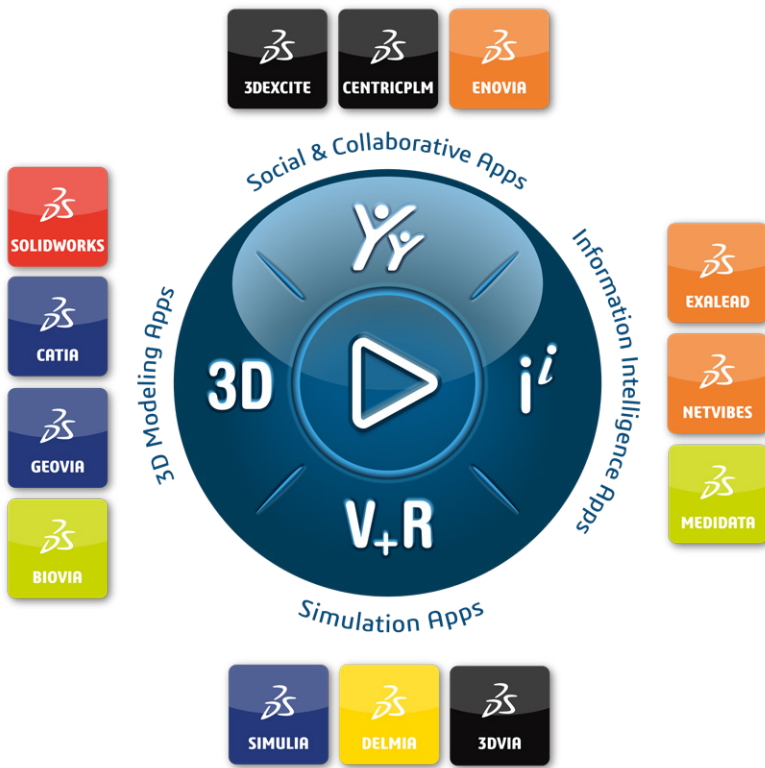
"The reporting via IQMS is extraordinarily valuable," explains Duffey. "Because of its use of tracking information, the reports define the utilization rates of every machine in our facility on a daily, weekly, monthly, quarterly, and annual basis. So we know the utilization rate for every machine in our organization, right up to the minute." Consequently, if PCI is coming up against some capacity ceilings, it can make decisions about new expenditures (i.e., for new capacity) based on the regular analysis of utilization rates of every machine in their facilities.

According to Duffey, having real time and accurate utilization information is extremely important for capital allocation. "A lot of companies in our industry make decisions about new capital investment when they 'feel like they're getting busy,' without having meaningful data to support those decisions," he explains. "When you're talking about a manufacturing cell that could cost 300,000 to 400,000 dollars, you want to make decisions of that magnitude based on good data and facts, rather than intuition. We spend two to three million dollars annually on capital expenditures, and the information that drives that capital allocation is the utilization data that comes directly in real time from IQMS."

The other aspect PCI cites relates to managing and understanding complexity. PCI runs 300 to 400 active part numbers, selling parts all over the world to a myriad of customers in many markets. With that level of complexity, it is difficult to know where you are making money and where you are losing it. "It is literally like juggling flaming torches," says Mussel.

"Having the ability to know whether you're making or losing money on specific parts has been the scourge of the plastics industry for a long time," he continues. "Because of our finely detailed views in creating BOMs for each part in our facility, IQMS allows us to identify, again in very fine detail, the profitability of every part we manufacture. That's important. When you have that many variables, if you don't have that granular information to know where you're making and losing money, you'll never run the business as financially effective as you should."

In the end, concludes Duffey, operating an automated facility effectively and efficiently rests on the quality of information: "Our ability to run a successful, profitable molding business is only as good as the quality of the information at our disposal. Opening a 'lights out' facility required having complete and total trust in the information IQMS was telling us on a real-time basis. That same requirement must hold true for every molder, no matter their size or complexity. The greatest manufacturing strategy in the world will never be as effective as it could be without accurate, timely data."



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