

Machining the industry



Thomas Cutler discusses various software solutions for the machine tooling industry

The term 'machine tooling' covers a vast array of companies and manufacturers worldwide. Software solutions proclaiming complete process improvements are many; few actually deliver. The machine tool and component manufacturers can drive bottom-line impacts rather quickly with the use of software solutions in several specific areas. Recently a supplier of transmission components for automobile and heavy equipment industries could not manage production to meet a large customer's demand—the customer was threatening to award the contract to another supplier. There was an urgent need to expand capacity and prevent their competition from capturing the business. Even though employees in one department were working three shifts, seven days a week to meet production quotes, they fell short of the target output. Senior management assumed the only way to add capacity was to add machinery. This was a high-risk strategy due to the large capital expense and increased labour headcount required.

According to Evan J Miller, President and CEO of Hertzler Systems, "Senior leaders believe that if they know more about the true capacity of the equipment in

the department and the reasons for machine down time, they could optimise and improve equipment utilisation. Once they had this knowledge, they believed they would be able to make more intelligent decisions about expanding the department." Miller provided the software mechanism—a means to track each machine by the minute, recording setup times, maintenance and run times. This information was then captured automatically in a database, along with detailed information from the operator.

With this information stored in a central database the manufacturers created multilevel Pareto charts to help determine how many non-value-added minutes were spent on various activities, such as fixing electrical problems or making adjustments. According to Miller, "Over a six month period the department went from a seven-day work week to a five-day work week, saving more than \$100,000 in overtime costs. Simultaneously, the company increased its output by more than twenty-five percent, while minimising defects and scrap. Increasing productivity on existing equipment allowed the company to avoid purchasing additional equipment, thereby saving millions of dollars."

Automated data collection a must: The road to SPC

"In a data-driven society, automated data collection is a must," says John Foley, Network Administrator for Engineering Systems of Pollak-APD (Actuator Products Division) a Stoneridge, Inc company. "The quicker we get information in hand, the better-off we are."

With this idea in mind, statistical process control (SPC) solutions for the machine tool sector has become a requirement and some of these industry leaders—leading SPC providers such as GainSeeker SPC—are adding increased functionality such as support for OPC (Object Linking and Embedding for Process Control). "OPC is the standard computer protocol for communicating with machinery and process controllers," noted Byron Shetler, Chief Technology Officer for the GainSeeker product. "Supporting OPC creates great new opportunities for collecting data from production equipment in real time, performing statistical analysis on the data, and then feeding information back to operators, engineers or to the equipment itself."

Customer-driven innovation

Support for OPC came about as a

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request from several customers in recent years. Pollak-APD started designing, engineering, testing and manufacturing excellent work-enabling devices for the transportation industry based on efficient electro-mechanical actuation technologies and almost five year ago, Foley started automating data collection after he noticed a secretary hand-keying thousands of data points into a spreadsheet. Foley noted, "Talk about non-value added activity and error-prone! You can't rely on that data." Foley recognised that there had to be a more efficient way to capture and record this data and purchased some software to import the information automatically into a spreadsheet. That effort was the beginning to a significant lean process improvement.

The company began to evaluate software that enabled them to talk directly to PLCs ("Programmable Logic Controllers," process controllers common in factory automation.) At an Allen-Bradley shop, Foley found some very expensive software intended for the electric power distribution industry.. Foley installed the software and found that the solution was very fast and very stable, but had a brutal configuration language and

Pollak-APD learned that they could not support it over the long term.

From that experience, they knew they needed open systems standards and that led them to OPC. Pollak-APD purchased an OPC server and client suite from Iconics (Genesis 32) - the suite came with an SPC package - but it was far too limited in functionality. Meanwhile, Dave Cappucci, Director of Total Quality Management at Pollak-APD, was searching for shop floor software for tracking product quality.

Ironically, he had used GainSeeker SPC at a prior job and knew it was a powerful and reliable system for product data. When he made his decision to purchase GainSeeker, Cappucci was aware of Foley's desire to capture process data from PLCs. Together they reasoned that they could find or write a middleware product to move process data from OPC to the GainSeeker database, finally realising Foleys' vision of truly integrated SPC on the factory floor.

Rapid deployment

Foley was also impressed with the speed of deployment. "If we had written this interface ourselves, it would have taken us 3-4 man months of intense programming and in the end we would have

had a system that solved one problem. Additional solutions or modifications would have taken more time. With the GainSeeker solution we got it running in a few hours, and we have the ability to modify it quickly and easily."

The payoff: rapid ROI

Pollak-ADP is a Six Sigma/lean shop and has put a lot of emphasis on OEE (Overall Equipment Efficiency). They have one particular product with a sub-four-second cycle time. This equates to about 17 parts per minute, 22 hours per day, six days a week. By analysing downtime with GainSeeker, they were able to boost OEE from 65 per cent to 75 per cent, representing more than a \$130K increase in throughput. This has enabled them to keep with up with increased product demand without increasing production capacity (no capital investment) or staffing.

Pollak-ADP also observed that the ability to capture and analyse product and process characteristics real time enabled them to produce excellent products at the highest levels of quality. This was especially important because of their location (Boston). According to Cappucci, "We have to be that much better than our competition to enable us to continue to manufacture in this highly paid labour market." While the marketplace will continue to present numerous software solutions for the machine tooling industry, it is only when the bottom-line return-on-investment can be quickly quantified that customer satisfaction is earned. Devising the metrics to achieve the specific goals of a machine tool plant or operation is the only way to achieve lean and competitive advantages. 📌

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