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Thumb Tool & Engineering

North America's second largest supplier of aluminum extrusion dies and tooling turns to VERICUT for its simulation needs

User Story

North America's second largest supplier of aluminum extrusion dies and tooling turns to VERICUT for its simulation needs…and then takes the software even further

With the skills gap growing a bit larger each day, manufacturers large and small are turning to automation for their production floor labor needs. To most in the industry, this means fleets of robots, unattended machine tools and autonomous material handling systems, but what if there were another type of automation, one that provides similar results—the ability to produce more with less—yet requires none of the expense and complexity of electromechanical systems?

Avoiding the drudgery

Josh Bryant will tell you there is. He'll also tell you he never intended to work in a machine shop. But shortly after earning his bachelor's degree in computer science, he received a call from his friend Andrew Rowe. "Hey, we're looking for someone to help out with some solid modeling," he said. "You interested?"
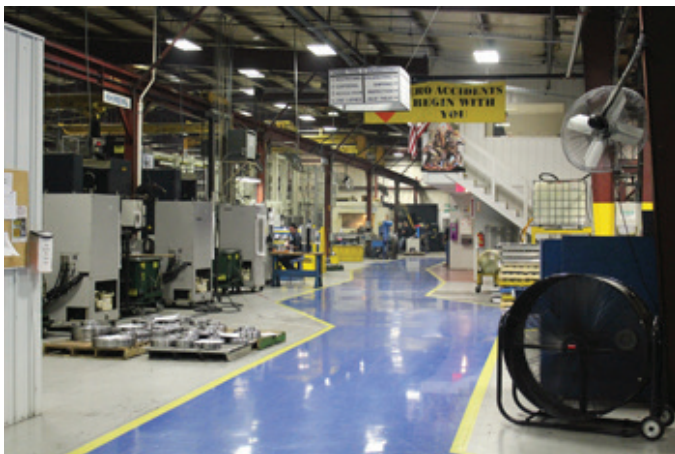
The "we" that Rowe was referring to is Thumb Tool and Engineering in Bad Axe, Michigan, where he works as a CNC programmer and automation specialist. A leading manufacturer of extrusion dies and assorted tooling, Thumb Tool machines parts up to 42-inches in diameter, 72-inches long, and weighing up to 33,000 pounds. It's also an important member of the Gemini Group Inc., which has 17 facilities covering more than one-million square feet of production space and specialises in precision machining, injection moulding, and tooling for the die cast and metal extrusion industries.

It wasn't long after Bryant settled into his new position at Thumb Tool, however, that he grew impatient with some of its more mundane tasks. And since he's a Java programmer, he decided to write a series of macros that would automate those tasks, freeing him to work on other, more meaningful activities. "Others saw what I did and liked it, which basically sparked a 'what else can we do?'

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revolution within the company," he explains.

Building better mousetraps

What began as a utility to verify basic information about the shop's NC programs soon blossomed into a full-blown "file management system," that today is the go-to tool for monitoring job status, documenting whether there were any issues during production, how those issues were resolved and by whom, and so on.

As Thumb Tool management saw their scrap rates fall and analytical capabilities rise, they charged Bryant with integration of his burgeoning file management utility with other software packages. He started with California-based CGTech's VERICUT software, which the team of NC programmers there uses to simulate toolpaths on the company's assortment of Makino, Okuma, and Mazak machine tools.

"What I do is generate the actual VERICUT project code through a custom job interface," he says. "All the programmers have to do is click a green button on an internal web page and the software connects to Creo (a 3D CAD program from PTC), extracts the solid model, and runs VERICUT in the background for them. It also does a preliminary check of various program values, so there's no time wasted on simulating toolpaths for a job that won't fit in the machine or doesn't have enough tools in the magazine."

Bryant admits that, on new jobs anyway, the time savings isn't tremendous—what would have taken several minutes in VERICUT to setup is now an automated ten seconds or less. When multiplied by the 30 to 50 new jobs each week, however, he estimates this simple function saves several hours each week for the programming team, while eliminating mistakes and missteps. "The biggest benefit has been on repeat work, because I added the logic to automatically regenerate whatever we did previously—the programmers don't even have to touch them, which easily saves half an hour or more per job."

None of this surprises VERICUT product manager Gene Granata, who says VERICUT's non-proprietary file formats and innate automation capabilities make it relatively easy to avoid some of the click-work that would

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otherwise occur during a typical NC programming project. "Many organisations have figured out, 'Hey, if I create a little Java program or C# script that reads the data coming out of my CAM system, I can create the necessary setup files and launch VERICUT, all with a single button push.'"

Don't be afraid to ask

Yet Granata is quick to point out that, while custom interfaces and automation routines such as Thumb Tool's may make the programming department more efficient, less tech-savvy shops can enjoy the benefits of automation just by using VERICUT's out-of-the-box capabilities. These include batch file processing, command-line arguments, enhanced software control through parsing of statements made in the post-processed code, and more.

"One of the biggest strengths of our software," he says, "is that for more than 30 years CGTech has accommodated thousands of enhancement requests. Because of that I'm constantly telling people at training events and trade shows that VERICUT is incredibly robust and ready to "grow" when you are. If there's something you need from our software and you have trouble finding it—the vast majority of the time, it's already in there. Just contact our Support group and ask- they're very skilled at helping people find and implement unique solutions, including automation."

VERICUT capabilities notwithstanding, it's clear that Bryant's homegrown software system has gone far beyond his original intent. If he had it all to do over again, he says he would have done a more thorough job up front of documenting Thumb Tool's engineering and programming processes up front, finding their commonalities, and then setting about simplifying those process wherever possible—doing so would have made the task of automating them simpler as well.

And regarding his taking a position as a software developer at a company that machines billets of metal the size of coffee tables, he has no regrets. "My original plan was to get into a programming firm, maybe on the medical side," he says. "But I've found that, after becoming part of the manufacturing industry, I'm intrigued by everything I see. My day is never the same, I'm always fixing something or working on something different—it challenges me in ways I never expected. I think that somewhere along the way, I fell in love with manufacturing."

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