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Anthony Allwood, information technology (IT) manager,
Abba Systems



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With TOC and M2M Synchronizer, Abba Systems Conquers Barriers to Growth

Abba Systems has recorded exponential growth in revenues each year since taking its first order in 1993. Based in Brantford, Ontario, Abba Systems makes custom components—primarily metal mold tooling for plastic beverage containers—for a variety of customers in the bottling industry. More than one fifth of all plastic bottles in North America are made using Abba Systems mold components.

Abba Systems’ long-running string of financial success is linked directly to its ability to deliver high-quality, precision-machined components on short notice. As sales continued to grow, however, Abba Systems found it increasingly difficult to maintain the turnaround times that its customers had come to expect.

“If we received what we considered a hot job—something from a regular customer with a very tight deadline—we might not take any more orders for a couple of days so that we could focus on that hot job,” says Anthony Allwood, Abba Systems’ information technology (IT) manager. That approach kept Abba in the good graces of its regular customers, but it also prevented Abba from capitalizing on all of its business opportunities.

To remedy that situation, Allwood and some other Abba managers began studying a Supply Chain Management (SCM) concept known as the Theory of Constraints. Eli Goldratt, a world-renowned expert on business issues, is generally recognized as the author of the theory, now commonly referred to as TOC.

TOC holds that every business operation has, or should have, one main bottleneck—or capacity constrained resource—that is the main determinant of overall operation throughput. By exploiting that resource and adding buffers to keep it highly utilized, Goldratt contends, a business can increase its overall throughput. And if a business can increase throughput while keeping expenses level, it will automatically improve profit margins.

Finding New Capacity

That is precisely what Abba Systems was seeking to do. Allwood says studying TOC helped Abba discover that personnel—or, more precisely, a lack of people with a broad set of machining skills—was its primary constraint. It simply didn’t have enough skilled people to produce the required amount of goods.



Abba addressed this issue by establishing a CNC Grinding work center as its primary capacity constrained resource (CCR or drum), allocating the limited supply of operators to that and other work centers in such a way as to ensure that the primary constraint did not move, and then building a buffer of extra material in front of CNC Grinding.

“We began operating in this fashion about a year ago,” Allwood says. “And almost immediately, we saw our throughput go up while Work-in-Process inventory went down.”

Still, there was room for improvement. The Drum-Buffer-Rope (DBR) process was working, but there was too much data and too many variables to manage effectively. As Allwood said, “Doing it manually was a large effort.” And with demand still well in excess of capacity, the potential benefit of a more automated and responsive DBR “system” was attractive.

The Made2Manage® Enterprise Business System Helps Lighten the Load

Fortunately, Abba soon got help in managing this effort from its primary enterprise software supplier, Indianapolis-based Made2Manage Systems. “At the time we started studying TOC, we received word that Made2Manage Systems was developing a new scheduling package based on TOC principles,” Allwood explains. “So we were waiting to see how that would develop.”



A few months later, Abba was asked to become a beta tester for the new Made2Manage scheduler, which meant Abba would be actively involved in the product’s development. “We knew they had been investigating TOC,” says Kyle Sanford, SCM product manager for Made2Manage Systems, in explaining Abba’s selection for the beta test. “After talking to them about what they expected from a scheduling system, we thought they would be perfect to provide input on our new product.”

Made2Manage calls its new product, which has been on the market since September 2001, M2M™ Synchronizer. It is an integrated component of the Made2Manage Enterprise Business System, which is a complete set of solutions for automating business processes, including sales and product design, finance and human resources, customer service and support, as well as scheduling and distribution.

Abba Systems purchased the Made2Manage Enterprise Business System roughly three years ago, and Allwood says the positive relationship that had developed between Abba and Made2Manage Systems made the decision to adopt M2M Synchronizer, even in its pre-release state, an easy one.

Automating DBR Schedules

Abba Systems began testing M2M Synchronizer in May of 2001. The application’s real-time data share with the underlying Made2Manage Enterprise Resource Planning (M2M ERP) system meant that part, inventory, capacity, sales order and job data was instantly available in scheduling—and that schedule status and changes were instantly available to M2M ERP.

Sanford notes, “M2M Synchronizer is built to schedule operations for both plants that run under TOC principles and those who prefer more traditional scheduling methods. When TOC is the preferred scheduling approach, M2M Synchronizer can help a company identify its main bottleneck—or the primary Capacity Constrained Resource in TOC terms—and then create schedules to “exploit” and “buffer” that resource, maximizing the throughput of that resource and the operation as a whole.”

The first benefit received from M2M Synchronizer, according to Allwood, was the ability to track jobs in greater detail. “Most of our operations are completed in a matter of hours or days, and most scheduling packages are designed to handle projects that take months to complete,” Allwood says.

“So we were immediately pleased to have a package that could compress schedules into the timeframes in which we operate.”

The company reached a significant milestone when it determined that M2M Synchronizer was able to properly and automatically schedule the CCR resource—CNC Grinding—that acts as the drum and determines throughput for the entire operation.

Now Abba is looking to use other M2M Synchronizer features to help automate the process and timing of job release and the sequence of work in non-constraint work centers. Abba and Made2Manage Systems are also collaborating on planned extensions to the buffer management capabilities of M2M Synchronizer.

“M2M Synchronizer works better than any scheduling package I have seen,” Allwood says, adding that Abba has increased its overall throughput by 27 percent, while reducing both its inventory and its lead times since implementing TOC and DBR principles and installing M2M Synchronizer.

“Effective capacity has increased by 80 percent, even though only 20 percent of real labor capacity has been added. And raw material inventory has also decreased because the additional effective capacity allows us to wait longer before ordering raw materials for specific jobs.”

Perhaps more important, Allwood says, “We can now accommodate quick turnaround times for new orders without derailing orders that are already in production.” That means Abba Systems is better positioned than ever to extend its rapid growth streak well into the new millennium.

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