

## Breaking Old Habits

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**By instituting three new rules for multiproject execution -- based on critical chain principles and supported by a technology solution -- an engineer-to-order company has been able to take on more projects, and deliver them faster.**

Projects are the lifeblood of Michigan Custom Machines (MCM), an engineer-to-order company that has designed and built custom test machinery for automotive and industrial component manufacturers since 1974. With expertise in diesel fuel system component testing for end-of-line production, R&D and endurance, MCM incorporate hydraulics, electronics, 3D parametric design, controls, data acquisition and assembly line integration into its custom testing products.

At any given time, MCM has a number of projects under way, and for each one, the company's first consideration is to complete them on time for its customers. That's not an easy goal to meet. "Contention for resources is a reality," says MCM president Michael Schena. "Still, traditional project management methods assume a perfect world, one where events can be precisely planned, and everyone knows exactly when projects will get the resources they need. As with most companies like us, our world isn't perfect."

However, thanks to the adoption of key critical chain and lean principles, supported by a technology platform called Project Flow, MCM's world is a lot better than it used to be.

"Everyone understands that plans are only approximate, and that projects are riddled with uncertainties," from customer requirements change to vendors that do not deliver on time, Schena says. "We needed to maintain tight coordination and control during execution, even as uncertainties hit us. We also needed forward visibility. It was imperative that we know when a project was about to get off-track so that we could take corrective actions at once, pointing it back to the right direction. When uncertainties played havoc with our schedule, we wanted to learn how we could make up the time without impacting other projects."

If MCM could do this, Schena knew, it could then give its customers shorter lead times and more accurate due dates, or, at the worst, inform them earlier that their project would be late instead of as a last-minute surprise.

Experienced managers know the devastating effects of project uncertainties and contention for resources, and they typically respond by starting their projects as soon as possible to have any hope of meeting their commitments. "Unfortunately, when too many projects are in execution, it only increases contention for resources," Schena says. "Another common response is to create precise schedules for people and tasks, but that only encourages people to add massive safeties into their estimates. No wonder, our lead times were much longer than they ought to be."

To improve its management of resources and uncertainties, MCM began using Project Flow from [Realization Technologies](#). Based on Critical Chain and Lean principles, Project Flow identifies the most limited resources across all projects and helps select the most profitable project/product mix, given those constraints, Schena says. In addition, it dynamically prioritizes resources during execution so that the project keeps moving despite local delays.

Project Flow works by defying conventional practices, according to Schena. He explains the three most important rules that MCM project managers have implemented on their efforts:

### **1. Don't start projects ASAP**

Contrary to single projects, in which it is good to get a head start as soon as the project is approved, starting all projects as soon as possible is counterproductive in the multiproject world. It creates unnecessary bottlenecks, gives rise to confusion about priorities and induces multitasking. Instead, multi-project success starts with acknowledging that the most heavily loaded resources (constraints) determine how many projects can be done. Releasing projects faster than what the constraints can handle is useless. Therefore, the first rule of multiproject success is to select the most profitable project mix given the constraints and release work into execution based on the availability of those constraints.

### **2. Assign buffers where they can do the most good**

To protect projects from uncertainties in single projects, the most typical option is to add safeties to every task. However, in multiproject environments, small certainties multiply and the safeties become immense. Therefore, the second rule of multiproject success is to have buffers smartly placed to protect the longest path, which ensures that the overall project keeps moving despite local delays. This is much more efficient than building safeties into individual tasks.

### **3. Don't create precise schedules at planning time**

Instead of creating precise schedules for tasks and resources at planning time, the third rule of multiproject success is to set schedules in execution based on how much buffer is remaining. Tasks with the lowest buffer ahead of them get the highest priority. If buffers in a project are running too low, project managers and executives now have the early warning signs missing in traditional management.

When MCM started the Project Flow implementation, it was behind on delivery, with some projects lagging by weeks, and others by months. It took the company about two weeks to convert projects to the Project Flow mode while MCM discontinued its practice of Gantt charting.

Today, priorities are no longer set on an ad hoc basis. "We are aware of problems before they arise and no longer need to scramble, especially at the end," Schena says. "It's actually all quite simple. We create project plans and provide task updates — the enabling software system takes care of the rest."

As lead times have improved, MCM acquired new business. "Prior to implementing Project Flow, we were quoting six months for delivery and were consistently one to two months late," Schena says. "Now, we are on time and able to schedule projects with due dates of less than six months, even though these projects are more complex."

Customers continue to change their requirements, of course, but now MCM can accommodate many of them without creating chaos, Schena says. The company can also immediately provide them with a new due date. "Everything is known well ahead of time and any new dates are at the customers' discretions," Schena says.