Arizona Tooling and Machining Association
Precision News
Article for April 2010 Issue

Fast and Dependable As An Unfair Competitive Advantage!

by Skip Reedy

American manufacturing has been facing increasing competition for many years. This competition is not letting up and the economy has not helped.

High mix – low volume job shops and machine shops have a difficult scheduling environment due to simultaneous production of numerous jobs with different routings, set-ups, process times, due dates, priorities and requirements of finite capacity resources. Jobs compete for and wait for resources, while expediting, stress and overtime join the fray. Making more detailed schedules, better forecasts, balancing capacities, expediting harder, hardly improves the situation. With nearly everything variable, job shops are notoriously hard to schedule or predict deliveries.

Focus on Efficiency and Symptoms

Traditional solutions go after symptoms, or they try to improve the performance of the system by improving the performance of all of its parts. It seems to make sense. If all the parts are working efficiently, the sum of them must be efficient. Yet, with all of the conflicting demands, it doesn't quite work out as expected. The symptoms are still there.

You likely have a lot of years in your business. You have probably seen and tried your share of ideas with varying results. The fact that you are still here is testimony to your skill and tenacity.

Focus on Flow

Breakthroughs come from areas most people are simply are not aware of. Instead of focusing on machines, people, processes and orders, look at the shop as a system, with a flow of work. Identify what slows the flow of work from getting through to the customer. There is usually one thing that most limits the flow. It's called a bottleneck, the system constraint. It is the most heavily loaded resource. The constraint is like the weakest link in a chain that determines a chain's strength. Similarly, the most heavily loaded resource determines the limit of a shop's output.

Take for example, a garden hose with a kink in it. The kink is the bottleneck of this system.

To get more water through the hose, straighten the kink. Improving any other part of the hose won't make a difference. Helping the bottleneck results in a direct improvement in throughput.

The bottleneck or constraint can be a person, a machine, a work cell or a department (even a policy, the market or a kink). Fortunately, there will always be a constraint in a system since it's necessary and extremely valuable. It determines the system output. It's the first place to make improvements to increase throughput because the results are immediate. (Fixing any other area usually has no effect on output.) A constraint is only a problem if you don't know where it is or why it's overloaded.

Managing Flow

The constraint can function as a critical control point for management. Rather than watching all of the parts of the system, just watch the constraint to know how the system is performing. Then business decisions based on how they impact the constraint make sense.

Nothing should get in the way of the constraint by wasting its time or starving it. That means the rest of the system must support getting the most through the constraint. Protect the constraint. Keep it producing. It's the heartbeat of the shop. If the constraint stops, throughput is lost, and throughput is how fast the shop is making money. Lost throughput can't be made up. If the operator of the constraint goes to lunch, throughput is out to lunch too. If the hourly throughput for the total shop is $2,000 per hour, that's an expensive lunch, every day.

High mix – low volume shops are very complicated because the bottleneck will move as the mix of orders changes. A wandering bottleneck is chaotic. Monitoring and managing the planned loading protects the flow from unexpected bottlenecks.

The Theory of Constraints (TOC)

Managing a system as a flow of work through the constraint was developed by Dr Eli Goldratt, a physicist who applied scientific thinking to business. His Theory of Constraints says, "Every system has something that limits its output." Since a business is a system, the business is limited by something. He calls this a constraint.

Goldratt introduced TOC in 1984 in his business novel, *The GOAL*. TOC has since been used in most major companies around the world to dramatically reduce lead time while increasing throughput, profits and due date performance.

The solution looks simple, but the results are extraordinary!
Every business is unique, yet they have similar challenges. The Theory of Constraints' production solution has been successfully applied in a wide variety of industries, such as manufacturing, construction, healthcare, engineering, banking, maintenance & overhaul. Typically:
Lead Times drop by 69%
Due-Date-Performance improves by 60%
Inventory drops by 50%
Throughput increases by 68%
If you had results like these, what would that be like for your company?

Five Focusing Steps of the Theory of Constraints

1. Identify the system's constraint.
2. Decide how to best exploit the constraint. (Get the most throughput.)
3. Subordinate all other processes to the above decision. (Don't block or starve the constraint.)
4. Elevate the system's constraint. (Get more of the constraint.)
5. Don't let inertia become the constraint. (This is a Process of Ongoing Improvement.)

The Theory of Constraints requires a paradigm shift in thinking. Instead of managing the schedule and every resource, the Theory of Constraints focuses on managing the flow through the constraint. Resources, equipment, software and processes do not need to change.

Many people are unwilling to change the way they manage. The Theory of Constraints doesn't look or feel like what they are used to. They can continue with what they have been doing and be pretty certain how it will be six months or a year from now, and they can be okay with this. Some people see possibilities that they want for themselves and are willing to try on something new.

Consistently Fast is a Competitive Advantage!
When using the Theory of Constraints approach, manufacturing lead times can be short and due date performance near perfect. Competitors will not understand how this is possible. They may even think such delivery promises are crazy.

UnRefuseable Offer
Once very short lead times are dependable and there is sufficient freed-up capacity, a market offer can be created that the competition won't try to match because they can't. This is an UnRefuseable Offer, also called a Mafia Offer. It satisfies customers' needs so well that they feel compelled to take it. This is a powerful competitive advantage.

Speed, Predictability and Rapid Response become a competitive advantage.
Theory of Constraints is an UNFAIR competitive advantage.

The ATMA is "dedicated to keeping manufacturing strong in Arizona as well as on a national level." Critical Chain Production Management using the Theory of Constraints can help create that.

If you would like to find out more about this, then come to a workshop. A Critical Chain Production Management Workshop for Job Shops will provide simulations to demonstrate the difference a balanced line, an unbalanced line, and Critical Chain Production Management have on throughput.

Critical Chain Production Management Workshop

Location: **Jobing.Com** (headquarters)
4747 North 22nd Street #100
Phoenix, AZ 85016
Date & Time: **May 26th**, Wednesday
9:00 AM to Noon

To reserve a seat, call Skip at 623-533-4737.

CCPM Consulting
CRITICAL CHAIN PROJECT MANAGEMENT
CRITICAL CHAIN PRODUCTION MANAGEMENT

Skip Reedy is a Theory of Constraints expert certified by TOCICO. He is a Mechanical Engineer and an MBA. He is the only TOC consultant focused on helping Arizona companies. He owned Miller Fluid Power, which manufactures tool grade, air and hydraulic cylinders. As a manufacturing engineer with Boeing in Seattle, he made dramatic improvements on 747,767, 777 and 787 airplanes. He manufactured approximately 514,287,396 Stroh beer cans and owned two TCBY frozen yogurt stores. And for 12 years he has been doing great things with constraints!

CCPM is Critical Chain Project Management and Critical Chain Production Management

Skip Reedy can be reached at 425-923-5750 (C),
skip@ccpmconsulting.com and his website is www.ccpmconsulting.com