Need for Speed

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As more organizations achieve bottom-line benefits from Critical Chain, the execution management approach is moving from high concept to best practice, and adoption is on the rise. But even proponents acknowledge that its hard focus on faster results is not for every project environment. Here's a closer look at where and why critical chain is working.

The key to good project execution is not detailed planning and control, but coordinating execution priorities across the organization. That's the core concept of critical chain, and it may feel antithetical to some project managers.

Nevertheless, it has been about 20 years since Dr. Eliyahu Goldratt introduced critical chain and about 13 years since businesses began to embrace critical chain-based execution management. So given that the concepts are relatively new compared with longstanding project management approaches, where does the project management community stand today in terms of adoption and acceptance?

It turns out that as critical chain's big-win stories are tallied, more organizations are moving into the camp and a broader swath of industries are trying out the approach that promises faster and cheaper project results by up to 50 percent.

Just ask the leadership at the Corpus Christi Army Depot, who led an implementation of critical chain at the depot with strong benefits.

CCAD is the largest tenant organization on Naval Air Station Corpus Christi with more than 158 acres and 2.2 million square feet of industrial space, according to Ed Mickley, public affairs officer. With a workforce of more than 5,500 and annual revenue of more than $1 billion, CCAD is a major economic force in south Texas and the Department of Defense's primary facility for rotary wing repair — a demanding role based on the steady rate of incoming crash-damaged aircraft.

"After incorporating the efficiencies provided by Lean and Six Sigma processes, management decided to incorporate critical chain project flow to complement the Lean process," Mickley says. "With more than 1,400 active programs, critical chain offered process management to meet the increased demand. A first step was to analyze work-in-process [WIP] and reduce the workload. It was necessary to examine the number of aircraft being worked and tailor that number to a more efficient level; working on fewer aircraft or components would increase production levels for WIP."

Mickley points to recapitalized UH-60 Black Hawk helicopters with crash or battle damage as one example of critical chain success. Throughput on the line increased by decreasing turnaround time for aircraft assembly from 60 days to 21 days. "Similar successes are surfacing in other processes as well," he says.

Shaving 39 days off essential work is no small feat, and that's what is attracting additional interest to critical chain,

according to Sanjeev Gupta, CEO of San Jose, Calif.-based Realization Technologies, a proponent of the methodology and a vendor of related services and software.

Gupta says critical chain is past the early adopter stage and moving into the second stage, whereby companies understand the logic, but don't want to implement it unless they can get a big business advantage because of it. "Critical chain is not in the mainstream, but it is being adopted by those companies and business leaders who see the tremendous potential they can realize in terms of competitive advantage and bottom line impact," Gupta says. "For example, the U.S. Air Force has deployed our system in aircraft maintenance, repair and overhaul and saved $7 billion to $8 billion off the replacement value of aircraft. The faster they can do the repair projects, the fewer aircraft they need to buy. And Boeing's satellite systems division was losing $200 million a quarter before it adopted critical chain. Last year, that was the most profitable division in the company."

With outcomes like that, project managers and companies are taking notice. "As we produce results, we are getting incoming demand from other organizations that do similar kind of work," Gupta says. That's why critical chain has the deepest penetration among government contractors, he adds.

Further, interest is high in the maintenance and repair field, where days out of service cost dearly. "We see a pull coming from the market in maintenance and repair for process-type plants, such as nuclear plants, steel mills and oil refineries," Gupta says. But it may take two or three years more before critical chain becomes standard there. He also sees burgeoning interest in engineering, especially as it relates to infrastructure projects, in developing countries, like India and China, where there is infrastructure to build from scratch, and in the United States, where improvements are ongoing.

"A big bottleneck in these projects is in the engineering aspect," Gupta says. "As we demonstrate that we can get 1.5 or 2 times the number of projects with the same engineering pool with critical chain than without it, that is going to be the next area where it becomes mainstream."

Who Can Use Critical Chain?

One major question is whether critical chain works in all business sectors. Gupta says examples of critical chain success exist in other industries, including IT, high-tech product development and pharmaceutical development, but they are fewer.

"The concept can work in IT, but the way it is applied for IT is different vs. maintenance and repair projects. We've had to deal with how critical chain integrates with agile methodologies and melds with the big problem of scope definition. Another issue in IT is that pricing is often based on time and materials. So for example, with the large system integrators, there is not much of an incentive for them to do projects more efficiently, because it will lower their revenue."

The common denominator on who can benefit from critical chain most is speed: Unless speed is a goal, then critical chain won't be a draw. "There has to be some driver for doing the projects faster," Gupta says. "In the infrastructure world, if you are building a nuclear plant, the faster you build it, the faster you can start collecting revenue. For example, in nuclear power plants, every day is a million dollars, so if you finish the project a day faster, you make a million dollars. A typical project takes six years, but if you can do it in four years, there is a billion dollars for you. That's very motivating."

Gupta warns that while critical chain quickens the pace, it doesn't ensure benefits for all businesses. "Speed is very important in new product development, but just because you develop something faster does not mean you will succeed, because you also need to develop the right product. In new product development, speed is crucial, but what trumps speed is being able to develop the right product."

Implementation Insights

Just like critical chain is all about executing projects faster, implementation of the new methodology can be fast, too, according to Gupta. "It depends on the scope, but for an implementation that involves 50 or more engineers, you can begin to see the results somewhere around 8 weeks to 12 weeks. Where you institutionalize critical chain across the

whole organization, it can take from four months for a small organization and to about a year for a large organization," he says. "When we are trying to sell to potential customers, they don't believe it. They are always amazed at the speed of the results."

At CCAD, a steering committee managed the process over several months. "Initially meeting once a week, a core steering committee would view the progress of critical chain procedures from a big-picture vantage point," Mickley says. "They'd discuss action items that would require resolution at the executive level in areas where production needed improvement."

With fast-moving implementation, cultural change has to be handled in a systematic manner, Gupta says. To that end, Realization Technologies offers Concerto, a software tool, and implementation services. "The reason we started providing implementation services is that change management is so important," he says. "Our customers nudged us to become a total solutions provider. We were not in the implementation business, but the customers said they needed more support."

In the past four years, 90 percent of Realization's clients are getting significant results consistently. "It has made a difference for the clients, but it has also made a difference for the adoption of critical chain," Gupta says. "The market is in a place where companies will implement to get results. If they don't get results, they will not say good things about critical chain. Helping our clients also helps the chances for critical chain to become mainstream."

Still, Gupta notes that not all companies are apt customers, and Realization is careful to undertake a thorough analysis of whether the transition to critical chain will be worthwhile. "There are going to be many organizations where you improve project performance, but in the big scheme of things, it won't really matter. For example, with internal quality control projects, even if you improve project performance, it's not going to have a big impact on the bottom line so why go through the whole process?" In the analysis, Realization works to discover how a company delivers value to its customers, and what role projects play in delivering that value. "If projects don't play much of a role in the value chain, then improving the projects won't make any improvements for the customers. To the extent that the projects you do are mission critical for your business, and they can have a real impact on your business, you don't have any other alternative to get those kinds of results."

The folks at the Corpus Christi Army Depot couldn't agree more. Concludes Mickley: "Critical chain project management increased throughput in aircraft production, but is now being implemented depotwide one shop or process at a time. Work-In-Process throughput has increased by 25 percent. Incorporating CCPM throughout the depot will achieve higher WIP throughput, improved quality and decreased cost."

Three Rules of Critical Chain...

Rule 1: Limit the number of projects in execution, even if it means keeping some resources idle. Concentrating resources on fewer projects at a time not only allows them to be executed faster, but also reveals overall capacity to undertake more projects.

Rule 2: In execution, allow individual tasks to be late against the plans. That way people won't have to hide safeties inside their estimates and tasks will get executed faster because work won't have to expand just to fill the time available.

Rule 3: Provide uniform task priorities across all departments and levels of management. When everyone knows what to do and when, and is working on the same priorities, projects get done much faster.