



Uncommon Sense and Well-Kept Secrets

*What the Mysterious Power
of TOC Can Do for You*

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What the Mysterious Power of TOC Can Do for You

University of Tennessee professor Mandyam Srinivasan, Ph.D., is one of the foremost experts in the country on lean business principles and supply chain management. The author of *Building Lean Supply Chains with the Theory of Constraints* (McGraw-Hill, 2012), Srinivasan has won numerous awards for research and teaching in his faculty role with UT's Executive MBA, Aerospace & Defense, and Professional MBA programs and many other executive education courses. He holds the Pilot Corporation Chair of Excellence in Business.



Mandyam
Srinivasan, Ph.D.

He is also an ardent follower of the late business guru Eli Goldratt, author of the business-management novel *The Goal*, which introduced the Theory of Constraints (TOC) to lay audiences. TOC is still a radically underused strategy in the business world even though it produces powerful, measurable results.

In this paper, we'll talk a bit with Dr. Srinivasan about TOC: why it's such a well-kept secret and how it represents a fundamental shift in the way companies solve problems.

UT: So everybody knows about lean these days, but Theory of Constraints is more of an enigma. Why is that?

MS: Well, first let's be clear: many people know what lean is, but only in the sense that they know what a computer chip is. They're familiar with the concept, but they don't really know how it works. Hands-on knowledge of lean is not as common as you might expect.

It's more accurate to say that lean has been around for a hundred years, and it has been well-publicized and embraced on some level by many companies. But TOC, despite its slow arrival on the scene and its rather secretive history, is actually enjoying greater success now.

UT: Can you give us some background on that secretive history?

MS: Dr. Eli Goldratt first developed this body of knowledge way back in the late '70s and early '80s when he was helping a Midwestern manufacturing company called Howmet Corporation. He applied a management science tool called mathematical programming to Howmet's business practices and saved them lots of money. As the story goes, he was hoping to get academic recognition for it, so he gave it an academic name: the Theory of Constraints. The beauty of the Theory of Constraints was that it turned this relatively esoteric tool into something understandable and practical.

But the academics being what they are, they didn't recognize the impact of this novel way of presenting the power of mathematical programming. Their response was, "Oh, that's an old tool, we already know how that works," and so Goldratt probably shrugged and said, "Fine—I don't need you anyway, I'm doing quite well on my own," and went on his merry way. His methods remained a mystery for a long time because they stayed proprietary.

According to Theory of Constraints expert Dr. Mandyam Srinivasan, TOC changes the equation for companies willing to look at the big picture.

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That's its power.*

UT: So TOC arrived late on the scene?

MS: That's right. TOC didn't get the publicity of lean and Six Sigma because there was just one individual championing it. Until the early 2000s, only a few select experts in the field understood TOC principles and knew how to apply them. But now the body of knowledge is beginning to be more widely disseminated.

UT: And the University of Tennessee was part of that shift.

MS: Goldratt wanted to mend fences and reconnect with academics toward the end of his illustrious life, perhaps starting around 2005. He actually offered to come to the University of Tennessee in 2010 on his own dime and speak to a group of businessmen and entrepreneurs, and we took him up on it. He wanted to convince them that his TOC-based strategic method, which he called Viable Vision, could help young startup companies.

That he came on his own steam was pretty huge, considering the hefty fees and first-class airfare he normally charged for his presentations to industry. His talk at the University of Tennessee was very well attended, and he went on to deliver a keynote address that afternoon at the Entrepreneurial Imperative 2010 conference held at the New Hope Center in Oak Ridge. [Goldratt passed away in 2011.] His visit was a big success. It got a lot of people talking about what TOC could accomplish.

UT: If you're already using lean techniques, why do you even need TOC?

MS: TOC is more powerful than lean. That's because TOC helps you find the spot where you should focus your lean efforts, or your Six Sigma efforts. It's a prescriptive tool that drives you toward what needs to be done. Lean and Six Sigma, on the other hand, are more descriptive; although lean has something of a prescriptive nature in some cases, you generally tell it what to do rather than the other way around.

Lean purists will tell you that all waste is bad, that you have to apply lean everywhere and eliminate waste from all your operations. Then, the thinking goes, the entire system will benefit. While there's no question that removing waste through lean efforts helps reduce cost to some extent, that approach misses the big picture. It can result in misdirected efforts that don't actually benefit the system—or may even detract from it.

UT: How is TOC different from lean?

MS: Big-picture thinking is the central premise of TOC. TOC focuses improvement efforts at key points in the system that can provide the maximum leverage per unit of effort—that is, at the points of constraint.

Here's an example that illustrates the power of TOC: I know of one company in Kentucky engaged in maintenance, repair, and overhaul (MRO) that's doing really well by using just one TOC tool, throughput accounting. They're not a lean company at all—far from it, actually—but when they used throughput accounting they were able to figure out what their competitors' costs would be so they could underbid them.

It's possible they might benefit from becoming leaner in other areas, because sometimes actions that appear localized may well free up resources that help improve flow through the larger system. But TOC led them straight to the most important information first. That's its power.

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UT: Are TOC tools harder to use than traditional lean tools?

MS: They're not hard to use at all . . . they're just counterintuitive in some ways. I call it "uncommon sense."

Throughput accounting, which I just mentioned, flies in the face of traditional cost-world accounting practices, at least on the surface. Traditional accounting seeks to cut expenses and decrease overhead. That's its highest priority. But throughput accounting is always looking to maximize the rate of profit generation—to increase throughput—with cost-cutting as a secondary goal. It's a shift in thinking, to be sure. But you can adapt it to work with your old system fairly easily if you put in the effort.

The biggest challenge of adopting TOC, in my opinion, is embracing systems thinking instead of localized decision-making. Maybe half the companies I see try it. But probably less than five percent do it well.

UT: Why? What's so hard about systems thinking?

MS: Traditionally, when a system gets large or complex, the tendency is to break it down into manageable, understandable parts. In business, that means reducing the enterprise into smaller units, each with its own financial goals. The managers of these units have autonomy, and the thinking goes that if each unit does well, then the whole business will do well. That used to be true, to a degree.

But then the modern supply chain came along, with numerous interactions between numerous entities in an increasingly fast-paced environment. If you ignore those interactions and their effects and focus only on the health of an individual entity, you'll start making decisions that actually have negative consequences for the whole corporation and produce undesirable consequences in the supply chain.

To offer you an example, when a purchasing department receives a discount from a supplier for bulk purchases, it's motivated to buy in bulk. But this requires the purchasing department to carry more inventory than it requires, and the supplier's production team has to produce the bulk order, which generates a bullwhip effect upstream. A standing purchase order would be a better solution from a systems perspective.

Frankly, it goes a bit against our nature to look at the big picture. It's just human inertia. Kicking the can down the road—making change only within our own narrow sphere of influence—is often the easiest solution, so that's what we choose. But technology now makes real systems integration possible, and if you aren't availing yourself of it, you can be sure that your competitor is—or is at least giving it a shot.

UT: What kind of changes is systems thinking—and TOC in particular—bringing to the landscape?

MS: Well, one important example is job outsourcing, or offshoring. Offshoring is a by-product of the old way of looking at things, which emphasizes cutting costs to increase profit. But offshoring creates a number of costs that are often hidden—and often considerable. Systems thinking can shine a light on those hidden costs and show you exactly where they are. GE is an example of a large company that is completely rethinking its approach based on uncovering those hidden costs—it's now bringing thousands of industrial jobs back to the United States.

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UT: That's a major reversal.

MS: Yes, many organizations jumped into the offshoring tide because they found cheaper sources of labor and raw material overseas. It was only when they actually started to incur all the hidden costs that they realized offshoring did not really produce all the touted savings. While offshoring may be a good option for some commodities, it creates huge problems for a large number of products.

UT: Even when the evidence for doing so becomes clear, shifting to a systems perspective probably generates resistance, especially when a certain way of doing things has become ingrained.

MS: Yes. And another obstacle you may encounter when you're trying to implement TOC is that like lean, it's something you have to nurture in order for it to succeed, and many people find that difficult.

For example, if you are using TOC's highly effective project management methodology, you have to give the process daily attention to make sure everything is going according to plan. But we humans are a little lazy. We get distracted and don't pay enough attention to any deviations from the plan until it's too late. It's like spring cleaning at home—instead of doing a little bit every day and keeping the system in order, we wait a whole year and then try to fix everything at once.

UT: With that in mind, do you have any advice for persuading management to explore TOC? For convincing the business office that these tools really work?

MS: That's the million-dollar question, isn't it? And my answer is, come to the University of Tennessee to attend our TOC courses and find out how much this methodology can help you!

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