**Theory of Constraints – Part 2**

As stated in the previous article, constraint management is another improvement method that was originally introduced by Eli Goldratt in the book “The Goal” in the mid 1980s. Constraints are key leverage points in a process that control the entire process flow, generally because they have more demand placed on the resource (usually a skill set or a machine) that that resource can *currently* provide.

Constraints can be (and probably should be) divided into two areas of the company. The incoming information flow (customer service/sales through pre-press) and the printing, cutting, gluing, kitting part of the company. It is perfectly acceptable to have one in each part of the company. But not more than one.

**Buffers Protect Constraints**

Because constraints control the flow of information or production, they need to be protected so that their output is not interrupted. So, proper cross training and staffing, machine and die maintenance, not producing excess quantities, not producing poor quality product that ultimately cannot be shipped, etc., are simple ways to keep the flow moving.

Another important way to do this is to is to have a queue of inventory in front of the constraining resource so it does not sit idle because of lack of work in process. Defining the right amount of time that inventory should be in queue is important. This queue is called a *buffer*. It protects the constraint from not producing.

While it is true that this queue “violates” the wait time waste in lean, the queue is needed to make sure the constraint keeps producing is the flow into it can be interrupted. So, if you’re a screen-printing operation, if the actual screen printer goes down, and could be down typically for a day at most, then consider having made in advance one day’s supply of screens just for protecting the constraining printer.

After working various constraint management solution-based projects, I asked my clients, “What was the most important improvement we made in the company?” *Every one of them said it was the implementation of the buffer to protect the constraint.*

**Key Constraint Related Metrics**

Here are three metrics direct from The Goal, in decision making priority order. Notice cost is last.

1. Throughput (T) = Revenue minus variable costs, such as print media and possibly inks, kitting supplies, etc. You want to make decisions to make throughput, or “T” go up. Throughput is essentially net cash flow coming into the company
2. Inventory (I) = Amount invested in things that are going to be consumed in production. We want this to be minimized, but not to the point it adversely affects Throughput.
3. Operating Expenses (OE) = all other expenses paid by the company. So, your T needs to exceed OE. Whereas in accounting practices operating expenses are sometimes put into inventory (such as a portion of rent, utilities, etc.), that is not done here. Operating expenses are the cash paid out each month to support operations. Nothing is capitalized or deferred. OE should be controlled, not prioritized. So, if T goes up $100,000 and OE goes up $5000, it is OK that OE goes up.
4. Buffer queue time = if your goal is 8 hours of queue time, what is the level of that queue?
5. Throughput per constraint hour = use the T generated on a job and divide that by the number of hours it consumed at the constraining resource. This number can be quite shocking, because it is so different from the Gross Margin metric.
6. Lost hours at the constraint = unplanned downtime, unstaffed time, changeover time, etc.

**Decision Making Priorities**

Most companies focus decision making around reducing expenses as the logic is that is how you can make more money. But that takes your eyes from the real target, making more money. Saving money and making money are two completely different things. You probably did not start or buy the business to save money yet look at all the things you have put in place to make that the focus. Budgets are put together but skip over how to really grow revenues; that is typically a prayer. But the real way to make money is to force out costs. How ridiculous. Monthly P&L meetings comparing actual expenses to plan are held. There are so many paradigms around this ridiculous concept that it is almost funny except for the damage this internal focus does to the company.

Focus on growing the business properly. Use the metrics from above along with other ones like on-time delivery, order lead times, customer satisfaction, supplier performance. Don’t dwell on history, focus on opportunity instead.

I was the GM at a business in southern California that was overly focused on cost control. Every Monday morning there was a four-hour meeting on expenses. I could barely stand it. Fortunately, I had to travel from Minneapolis to San Diego every week, so I scheduled my flights for Monday morning. I focused my team on quality problems, tooling inefficiencies, staffing issues and T, I and OE. In six months, we went from the worst performing company in the portfolio to the best (there were 5 other companies). I wasn’t concerned about saving money. My team and I were focusing on throughput, high-quality, on-time delivery and generating cash flow. I had the same results at a Twin Cities based company – it’s easier when you focus on the right stuff!

More to follow on constraints management methods in the next article.

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**About the Author:** Bob Krausert is the owner of STRATE***X***, a Twin Cities based firm that works nationwide. Bob is the author of the book, ***Extreme Lean***, published in 2018. Bob has worked with over 60 printing companies, mostly mid-sized companies, but also with larger companies like Jostens and Banta, now part of RR Donnelly. During his career, Bob has trained over 12,000 people at both public and private events. Bob has been working with PIM since 2010, periodically providing educational seminars for its members. Bob can be reached at [stratexlean20@gmail.com](mailto:stratexlean20@gmail.com) or by phone at 612-743-8706. If you would like to have a specific question or topic covered in one of the articles, feel free to make the suggestion!