



Throughput Consulting, Inc. Article – for Publication

Theory of Constraints (TOC)

Theory of Constraints (TOC) is an overall management philosophy introduced by Dr. Eliyahu M. Goldratt in his 1984 book titled The Goal, that is geared to help organizations continually achieve their goal. The title comes from the contention that any manageable system is limited in achieving more of its goal (the Goal is typically more profit, now and in the future) by a very small number of constraints, and that there is always at least one constraint. The TOC process seeks to identify the constraint and restructure the rest of the organization around it, through the use of Focusing Steps which we discuss below.

- 1) **Why Change?** If there is a “GAP” between what you “have” and what you “want,” then continue on to the next step. Let’s state this idea another way. If you are not getting what you think you should be getting (or what you would like to be getting), then continue. Think in terms of “Bottleneck,” but apply it to more than just production issues. Apply it to any performance issue ... equipment or personnel. The more specific you can be, the better. Examples:
 - a) Preparation of invoices is taking longer and longer.
 - b) Eighty percent of new hires stay with us less than a month.
 - c) We often run out the loads we have build by the middle of third shift.

Of course, if there is no “GAP” in your business and everything is sunshine and roses, then there is no need to change anything. If this applies to your business, you can stop reading at this point and enjoy your unique situation.

- 2) **Identify the Constraint.** Yes, a little detective work is appropriate here. It is too easy to make assumptions and jump to conclusions. Don’t miss the opportunity to involve the troops; let them know what you are looking for and why. Get their thoughts.
 - a) Does the billing clerk have everything needed to prepare the invoices, or is there a lot of missing information ... perhaps the quote, hand blast or straightening labor, or simply the order weight?
 - b) Do we have a labor market with a really lousy work ethic, or do we stick the new guy on the ugliest job in the shop for days-on-end because that’s all we had time to show him?
 - c) Is there a change in mix, or perhaps not enough baskets of the right sizes? Or any number of other possibilities.

It is amazing how clarifying it is to just write down the nature of the constraint so others can understand it. If you did your job well you will get a “DAH” response from other team members – this means that you have identified the constraint properly.



- 3) **Exploit the Constraint** – get the most out of it possible – make it as efficient as possible. “Exploit” is a word with a negative connotation, but, yes, we must exploit the constraint. Get right in the trenches. Make sure all the folks involved know that there is something here that needs attention. And, it is quite surprising how often this solves the problem just because some or many did not know that this issue is important. Remember, this IS IMPORTANT because you have just identified it as the current primary impediment to your company from making more money.

If the Constraint is not yet “broken” (made into a non-constraint) then continue on to the next step.

- 4) **Subordinate other Non-Constraints** – have the folks do things that off-load work from the Constraint and/or makes sure the Constraint is never wasting its precious time waiting for work or processing parts that will end up being “scrap”. This step makes the most sense in the production bottleneck environment. Use the small tumble blast if there is a backlog at the large tumble blast even if it doesn’t seem as cost effective. (If the small blast has idle capacity - it has to because it is a non-constraint - then it is actually more cost effective so long as the parts are not too heavy for the equipment!)
- 5) If none of that works, then **Elevate the Constraint** – get more of it (buy, subcontract, etc...this is the first step where you may be spending some significant dollars.) You cannot end this step until the Constraint is “broken”.
- 6) Find the next constraint (Step 2) and repeat the steps; keep digging. If at any step the constraint is “broken” (made a non-constraint) then go back to Step 1 and find another gap between performance and expectations. One word of caution here – DO NOT let inertia become the Constraint! To not address something because “that’s how we’ve always done it” is itself a HUGE policy constraint. Policy constraints are harder to find, but when broken can have very dramatic, positive results.

We are all more comfortable in “routine” – we feel comfortable when things do not change. Let’s not forget that we are really talking about a continuous process of improvement; TOC coined this phrase long before it was picked up by other manufacturing philosophies. There is ALWAYS a constraint in any complex system of dependant events, be it a heat treating shop, an aircraft maintenance depot, a manufacturing line, a hospital emergency room, or the relationship between management and production or between you and your spouse. There will always be at least one constraint, something that is keeping the system from achieving more of its Goal. You need to keep going after the things that are limiting your company – one change will not last because the business environment keeps on changing. We cannot become complacent once again; we will never reach the finish line.

BUT you don’t want to become a professional “fire fighter”, constantly tracking down different constraints and changing policies you put in place last month so you can address this month’s constraint. Sometimes you need to choose to KEEP a constraint at a particular spot because it is easy to manage and control. With the constraint(s) “fixed”, you can more easily build systems to help manage them.



When managing your constraints using TOC, you will be:

- a) Dealing with real observations, the facts as best as can be determined.
- b) Reaching a common agreement with and among your employees on the facts, as well as selling the need for change.
- c) Receiving commitment in return from your employees on what is to be done, how, why, when and by whom.
- d) Greasing the skids for acceptance of the change. Be sure to let the folks know about the results!
- e) Helping every employee understand that continuous improvement is the new normal routine.

Next Article:

It sure would be nice to know, in advance, the few Orders that need your attention, instead of trying to “focus” on every Order, which of course is the antithesis of focus. Check back for our next article when we talk about “Early Warning Systems for Production.”

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