



Using the Theory Of Constraints to create a performance breakthrough

By Mickey Granot

Growth is not an option, but rather it is top management's mandate to lead the company to demonstrate stable top-line growth coupled with a satisfactory bottom line. To achieve those results, top management must lead the company to improve — and improvement mandates change.

The Theory Of Constraints (TOC) is a concise methodology aimed at effectively designing and implementing changes in organizations, resulting in outstanding top-line growth coupled with exceptional profitability. A report published by the Victoria University of Wellington determined that on average the results achieved by implementing the TOC are —

- 69% mean lead-time reduction
- 60% mean due date performance improvement
- 50% mean inventories reduction
- 68% mean throughput increase

TOC makes the following core assumptions about systems:

1. The results the system realizes are determined by the causalities that govern the system.
2. Any real-life complex system, governed by cause and effect, has very few causes that govern the results of the

system as a whole.

3. All human-based organizations are made out of interdependent entities (the performance of the system is the result of an effort made by a few/many interdependent entities).
4. The performance of any system composed of interdependent entities is restricted by no more than one of them.

Accordingly, TOC has two core processes for continuous improvement that are, at times, applied individually and, other times, jointly. These are the change process and the focusing process.

The change process

What to change? Identify the few (or one) core cause that governs the results of the system as a whole.

What to change to? Use the same causalities to construct a solution that reverses the negative sequences that diminish the system's performance.

How to cause the change? Construct an effective, logical implementation plan through the deep involvement of the relevant people in the system.

The change process enables quick zooming in on core problems and developing effective solutions and their implementation processes, so ongoing

improvements and impressive values are realized rapidly.

The focusing process

1. **Identify the system's constraints;** that is, the place where the performance of the system is restricted.
2. **Decide how to exploit the constraint;** that is, how to “squeeze” the maximum performance out of the constraint.
3. **Subordinate everything else** based on the decision above to make sure that no other part of the system limits the ability to squeeze the constraint.
4. **Elevate the constraint;** when the maximum performance of the constraint is realized, elevate it so system performance continues to improve.
5. **Go back to step 1** in case elevation resulted in a new constraint. (However, strategically, the system can be built so the constraint will not move.)

The focusing process provides the organization with a set of rules and measures, and the clarity required to ensure decisions and initiatives are evaluated aligned with the objective of generating more goal units, which in for-profit organizations means more profits.

The breakthrough approach to change

Performance breakthrough requires a breakthrough approach to change. It requires focusing, clarity, high certainty and controlled risk. The TOC change process provides the certainty and the comfort that the risks taken are under control. The focusing process provides the required focus and clarity.

Together, the two processes provide a consistent, effective and clear framework for providing top management with the perfect system to demonstrate ongoing and stable top-line growth coupled with an exceptional bottom line.

More than that, these processes are highly sensitive to errors, and less sensitive to data accuracy. By this, I mean that if your analysis brought you to take an action (for example, you identified your constraint but it is not really your constraint), the process will identify it rapidly, indicate the right constraint and enable quick correction.

Accept and identify the constraint

When accepting the claim that any system has a limited number of things that constrain its performance, it becomes clear that management’s attention and focus need to be invested in that direction — and the organization as a whole needs to ensure effectiveness in the way it handles this constraint.

When you accept the constraint concept, the first step is to identify what constrains your company. Identify the constraint (step 1 of the TOC focusing process).

Before identifying a constraint, you must first define it. **A constraint is anything that limits your organization from generating more of your goal units.**

If you are a for-profit organization, it is anything that limits your organization from generating more profits. If you are a hospital, it is anything that limits you from generating more units of health (clearly requires a definition).

How do you identify your constraint? That may be a challenge. What limits you from generating more goal units?

Here you can use some good common sense and intuition, as well as the common sense and intuition of your team. Try not to fall into the trap of making it a big analytical exercise. (Because your data is not necessarily accurate and up to date, and even if it is accurate and up to date, reality keeps changing. If you made a mistake, you will still realize impressive improvements, and TOC has a wonderful

correction mechanism that will rapidly identify the correct constraint.)

You may ask yourself these questions:

Is the constraint internal or external?

Meaning, if the demand placed upon your company should start growing, how long will it take before you will be out of the capacity to satisfy this demand?

1. If you answer, "Almost immediately," it indicates your **constraint is internal**. If you answer, "It will take some time for that to happen," it indicates your **constraint is external**.
2. If the constraint is internal, it means your organization is lacking capacity to satisfy the demand placed upon it. To identify where in your system this constraint is, you need to (a) have a good understanding of your value chain and (b) identify where within the internal part of your value chain lies most of the work-in-process (WIP). (Note that using the term WIP does not indicate a production environment. For example, in a bank you may look at queues. Even in a production system, the constraint may be in processing customers' orders. WIP across the whole value chain is not necessarily physical.)
3. If the constraint is external in your market, it means you are currently not able to generate sufficient demand for realizing more goal units. This is called a **market constraint**.

And that's all.

Another exciting part about TOC is its simplicity. TOC is focused on providing a working process that leads to rapid, meaningful improvements and effectively corrects any errors that even with the best design and analysis are inevitable.

Exploit the constraint

After identifying the constraint, the next logical step is to decide how to exploit the

constraint (step 2 of the focusing process) to discover how to squeeze the maximum possible goal units out of it.

Compared to identifying the constraint, deciding how to exploit it is usually a harder task. Clearly the variation is high. It depends on where the constraint is (internal or external) and on the specifics of the situation. Nevertheless, there are a few general guidelines that will help in understanding what is required for exploiting the constraint and for defining a generic process for making this decision. Oftentimes, however, the guidelines are insufficient, and the change process will be required for creating a full, detailed solution.

Let's start with the guidelines regarding an external constraint:

1. **Market constraint:** A situation where the company's performance is limited by the demand indicates that the company is actually suffering from lack of value differentiation. The market does not see any meaningful additional value for buying from the company compared to its competition. It does not mean that such value does not exist, only that the market does not recognize or appreciate it. The direction here is to create a new value proposition — a proposition that will, with high probability, lead to a clear differentiation in the value perception of the market.
2. **Supply constraint:** Assuming you are not the only consumer of the particular purchased item, a supply constraint indicates that the relevant suppliers are failing to supply to your demand, or choosing not to supply to your demand. Failure to supply indicates the communication of orders with the supplier is ineffective; refusal indicates the supplier has "more important" customers. The direction here is to

change the operational model with the supplier and the business model, so they align with the operational need and create a value proposition for the supplier that will shift his preference from what he currently perceives as more important customers to you.

While these guidelines seem simple, straightforward and understood, they are insufficient. Using the TOC change process, you can design and implement solutions for either (affecting the customer or the supplier's perception of value), identify what changes are required in the operational process and how to effectively implement them with your customers or suppliers. As a result, you will have a solution that enables you to exploit your constraint; that is, to squeeze the maximum potential of your market constraint or your supply constraint (maximum means until such time the constraint will unavoidably become internal, which will indicate it is time to start over again).

When the constraint is internal, meaning that the company cannot satisfy (almost) any increase in demand placed upon it, the constraint may be a real bottleneck — a resource that just does not have sufficient capacity, or more commonly, the misuse of capacity.

To identify the internal constraint, we used the guideline of the place along the value chain where the largest amount of WIP is waiting. The resource immediately after that “pile” is the constraining resource. The mission now is to understand the reasons that lead to the creation of the pile; that is, the reasons the capacity of this resource is misused.

Resources, queues and flow

Misusing a resource is normally related to queues. Generically, queues are a result of flawed flow. Flawed flow is a result of

following rules that do not permit “good flow” There are some basic simple rules for good flow.

1. Flow should be triggered by actual consumption. (Consider the water in your pipes at home. It only starts flowing when you turn on the faucet.)
2. You can never drive more WIP through the system than the capacity of the “narrowest pipe.” Therefore, the narrowest pipe needs to set the pace of release of work into the system.
3. As most, our systems are of discrete flow and not continuous like water. When you allow too much work to enter the system, the only result you achieve is queues (increased WIP inventory), which, in turn, is responsible for a long list of negative effects. (Note: “Too much” indicates more than the capacity of the constraining resource.) Therefore, the work released into the system should never exceed the quantity as defined by rule number 2 above.

Accordingly, when it comes to exploiting the internal constraint, the first thing you must do is to improve the control on your entry point to the system, so the amount of work approved for processing is in line with the capacity of your constraining resource. This step will almost immediately improve the flow of your system to the extent you may realize that what you thought was your constraint is actually not the constraint, and WIP suddenly accumulates in front of another resource. (The good news is that your performance has already improved significantly, and the TOC says to go back to step 1 of the focusing process of identifying the constraint).

At times, it may not be that straightforward to determine how to align the flow. Again, you can use the TOC change process to guide you.

In addition to these continuous improvement processes, TOC has developed a few core solutions that form the basis for exploiting both internal and external constraints.

For internal constraints:

1. **The production solution:** Exploiting constraints within production.
2. **The project management solution:** Exploiting constraints within the project delivery organization (such as in new product development or within the project organization for project-based businesses).
3. **The finance and measures solution:** Ensuring that behaviors and decisions are aligned across all functions and with the company's overall goal.

For external constraints:

1. **The marketing solution:** Creating a value-added market proposal that "directs" the market to clearly prefer your products or services offerings.
2. **The sales solution:** A great proposal does not sell itself. Your sales organization sells your proposal. The sales solution is designed to develop the processes and skills required for selling the value proposition.
3. **The supply chain solution:** To ensure almost 100% availability across the supply chain, thus guaranteeing that any and all external demand is promptly and efficiently met.

You know where your performance is constrained and you have a clear idea how to squeeze the maximum goal units out of it. At this stage, you face a new challenge: Your system did not start today. It has policies, procedures and measures that dictate perceptions and behaviors.

The existing modes of operations in other parts of the system might hinder the ability to exploit the constraint. Therefore, subordination is required. Subordination means that any and all existing modes of operations that exist anywhere in the system cannot diminish the exploitation of the constraint.

As mentioned, all the processes that feed into the constraint cannot allow the flow to reach the constraint too slowly or too quickly, compared to what is required to exploit it. All the processes that come after the constraint must be able to advance flow out of the constraint — without creating new constraints/bottlenecks.

- All supporting functions must perform their tasks in ways that cannot negatively affect the exploitation.
- All existing rules/procedures and policies that may result with such a negative effect on the exploitations need to be changed.
- Any measure that incentivizes such effects must be replaced or removed.

The TOC change process is the perfect tool for designing the appropriate solution. The TOC core solutions in production, supply chain, projects, finance and measures, marketing, sales and strategy provide the relevant subordination rules.

When you are looking for a quick, impressive way to increase sales and profits, TOC provides a perfect suite of methodology, tools and solutions that result in performance breakthroughs and the creation of infrastructure for continuous improvement. Together with Lean and Six Sigma practices (jointly known as TLS), you get a solid structure you can trust to continually lead you to realize an ever-growing top line with an exceptional bottom line — in a way no other solution can.