

Theory of Constraints:

Five Focusing Steps



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Introduction

What is the Theory of Constraints (TOC)? In short, it is an organizational change methodology with focused improvement of the organizational goal. The main idea of TOC is that every organization, or complex system, must have at least one constraint. If there was no constraint, then the organization would be able to generate unlimited goal units. “A constraint” is a factor that limits or constrains the organization from achieving more goal units. The goal of most “for profit” companies is to make a profit, provide a secure environment for employees, and satisfy the market. Theory of Constraints provides an essential set of tools that help to achieve the defined goal.

The essential parts of the TOC are called “The Five Focusing Steps”, where the key word is “FOCUS”. These steps are the cornerstone of the Theory of Constraints with its goal to grow profits through sales on the one hand, and control costs and eliminate waste – on the other.

Speaking in terms of the TOC, this step by step methodology starts with identifying the constraint which we will describe in the first chapter.

Have fun reading!

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1. Identifying the Constraint

Identifying the constraint sounds like a simple first step. However, if it was a simple step, why are most organizations unsuccessful when trying to identify it? To answer this question, we must refer to the teaching of Dr. W. Edwards Deming. He clearly articulated that attempting to improve a process that is not stable will result in the process becoming more unstable. Taiichi Ohno took the teachings of Deming and applied the concepts to a system and developed the Toyota Production System.

Dr. Eli Goldratt then applied the concepts of Physics to human based systems and developed the Theory of Constraints. Going back to Dr. Deming, the element that most organizations don't understand when attempting to identify the constraint is that in order to properly identify the constraint, the system must be stable. Attempting to identify the constraint in a system that is unstable is a guaranteed way not to identify the constraint properly. Deming stated that stability is achieved when no special cause (assignable cause) variation exist, and all the variation in the system is from inherent variation (common cause).

How to identify special cause variation?

So how does that apply to an organization on how to identify special cause variation? To help understand this, we have identified a list of special cause variation that we typically see in companies that are contributing to the instability. First is a list of special cause variation that is easy to identify, which includes:

- **late deliveries from suppliers or sub-contractors,**
- **quality issues,**
- **unplanned process downtime, and**
- **employees calling off or not showing up for work.**

The second list of special cause variation is not easy to identify, and these are typically the cause of most of the organizations' instability. Included in this list are:

- **processing easy work at the expense of the harder work,**
- **jamming rush orders into the system without consideration the rest of the orders in the system,**
- **batching work to be "efficient",**
- **pulling jobs ahead and batching to "save" setups,**
- **increasing the order size "just-in-case",**
- **creating daily expediting lists and forcing resources to changeover and work on the newest "hot list",**
and
- **jumping from one task to another before completing the first task, which is known as bad multi-tasking.**

If you want to achieve stability and properly identify the system's constraint, then your first step must be – eliminate the special causes in the first list from effecting the output of the system, and STOP doing the things in the second list. Easy, right? Not so easy. If it was easy, you would have done that already and would have identified the constraint.

In the next chapter we will discuss the second step in detail, determining how to exploit the constraint.



2. Exploiting the Constraint

Once the constraint is identified, it has to be decided how to EXPLOIT the system's constraint. This is the second step of the "Five Focusing Steps". By definition, "exploit" means "to make full use of and derive benefit from a resource", which summarizes the goal of this step. But, the essential part of this step is the decision of HOW to exploit the constraint. At this point in the process, the decision of how to exploit the constraint must take careful consideration. The organization should consider what location within the system does the position of the constraint provide the most leverage for the organization. In this case, leverage can be defined as the use of the constraint to maximum advantage. Therefore, the company should strategically determine the location where the constraint creates the maximum leverage for the organization. Depending on where the constraint is identified in step one, and where the strategic position of the constraint should be, this will guide the decision making in the remaining steps.

How to exploit the constraint

Deciding how to exploit the constraint will be different based on whether the constraint is internal to the organization or external in the market. When the constraint is internal to the organization, it means that there is more market demand than there is capacity at the internal constraint. When the constraint is external, it means that there is more internal capacity than there is market demand. If the constraint is internal, and the strategic leverage point is external, the organization must decide how to increase the capacity of the internal constraint above the market demand. Determining the amount of protective capacity to create internally will depend on the amount of leverage that can be created in the market by a market offer. Hence defining all the necessary actions to create the necessary internal protective capacity.

Keep in mind, that even though it might make sense to move the constraint externally, the organization must also maintain control of the internal system. This is accomplished by identifying the internal control point that is the best place for managing and controlling the flow of work within the organization. The internal control point can also be defined as the capacity constrained resource, which is defined as the resource with the least amount of capacity of the internal value streams, but has more capacity than the market demand. Based on experience, there is certain criteria to consider when defining where it makes sense to position the internal control point. The criteria include:

- 1. A resource where there is significant effort required to increase the capacity of the resource (effort can be defined as time and/or money)**
- 2. Convergent point in the flow (where multiple value streams come together into a single process, such as assembly operations)**
- 3. Divergent point in the flow (where multiple value stream have a common starting point, and then go different flow paths).**

It is of great importance to understand that the constraint governs the productivity of the company as a whole. The decision on how to exploit the constraint is essential to understanding how to maximize the utilization of the best leverage point for the organization, which will lead to breakthrough performance results. In the next chapter we will be discussing the third step of the five focusing steps: Subordinate everything else to the above decisions.

3. Subordinating Everything to the Constraint

The focus in the subordination step of the process is on the non-constraint resources. By definition, all non-constraint resources have some degree of excess capacity. It is the excess capacity that enables full utilization of the constraint. Furthermore, there can be two types of non-constraint resources: upstream resources, defined as resources that provide inputs to the constraint, and downstream resources, defined as resources that consume outputs of the constraint.

It is the role of the upstream resources to ensure that all the inputs are available for the constraint when needed, and it is the role of the downstream resources to ensure the outputs from the constraint can always be processed effectively.

Work effectively (not efficiently)

Subordination is the most difficult step to implement because it requires a paradigm shift of non-constraint resources. In most environments, the current mode of behavior is to work efficiently in all functions. However, under the new paradigm, the goal of the non-constraints is not to working efficiently, but to work effectively. Working effectively means to work in order to improve the effectiveness of the constraint.

For example, to illustrate this point: consider the situation where the constraint has multiple inputs required to do their work. Subordination means that the upstream resources need to supply the work to the constraint in a sequence that makes the constraint resource most efficient. This will require the upstream resources to rearrange their work sequence and to process work in order improve the flow of the entire system, which means improving the flow through the constraint. In many cases, this translates into the non-constraints working less efficient to make the system more efficient. This is an extremely hard concept for many organizations to understand, let alone implement effectively.

In addition, usually the current performance measures of the non-constraints don't support the concept of proper subordination. Traditionally in companies there are performance measures that are in place in order to maximize efficiencies within departments. Part of the subordination step is to recalibrate the performance measures to align with the new paradigm which is: when you have work, work effectively; when you don't have work, wait.

Subordination is critical

As you can see, the subordination step is critical to improving the overall performance of the company. Before moving to elevation, which is the fourth step, proper subordination needs to be done so that the amount of protective capacity of the non-constraints is fully understood. In the next chapter, we will discuss the fourth step, Elevating the Constraint, and how to do proper elevation so the system remains stable and capable.

4. Elevating the Constraint

At this point, the constraint has been identified, it has been decided how to exploit it and where to place it strategically, and how resources should subordinate to the constraint to make the whole system work more effectively. The importance of subordination in step three is the key for elevating the constraint in step four.

Contrary to popular belief, the concept of elevation is not to increase the capacity of the constraint to the point that the constraint is broken and shifts to a new constraint. The concept in step four is to understand how much protective capacity is available on non-constraints and, more importantly, how much protective capacity is necessary in the non-constraints to maintain a stable system. Therefore, the essential part of step four is not to allow the constraint to move, especially if it has been positioned strategically, and to maintain enough protective capacity in the non-constraints to keep the system in statistical control. My general rule of thumb is to have about 20% protective capacity in non-constraints to keep enough unbalanced capacity to maintain balanced flow. Of course, there are other factors that contribute to the amount of protective capacity necessary to maintain balanced flow, such as the number of dependencies in the system and the amount of variation in the system. The higher the number of dependencies and higher the variability, the higher the degree of protective capacity to maintain balanced flow and stability.

One of the main reasons not to elevate the constraint to the point where it is no longer the constraint is mainly due to the large paradigm shift it takes for organization to operate under the new rules for the non-constraints of “when you have work, work effectively; when you don’t have work, wait.” If the organization continually elevates the constraint and new constraints are constantly emerging, the organization must re-calibrate everyone’s thinking for the new rules to the new constraint. Since most organizations are not very good at communicating, this mode of operating is a recipe for disaster.

A second reason not to elevate the constraint to the point where it is no longer the constraint is because once the system is stabilized, and the organization has established a proper planning process around the capacity of the constraint. If the constraint moves, especially unintentionally, the company must re-do the entire planning process to satisfy the new constraint. Another major change for the organization. Thus, the cornerstone for elevating the constraint is performing the proper subordination; so, when it is decided to elevate the constraint, it does not shift.

Methods of elevating the constraint

There are several methods for elevating the constraint properly. Since there are two types of constraints – internal and external –, the methods for how they should be addressed are different. If the constraint is external, the organization’s main task is to create the “unrefusable” market offer, or an offer to the market that no other significant competitor can offer and reliably deliver. If the constraint is internal, there are multiple ways to elevate it. Those ways include: offloading tasks, integrating tasks, simplifying tasks, or eliminating tasks at the constraint. In addition, this could also include applying Lean and Six Sigma principles to improve effectiveness and utilization of the constraint.

In either case, the leadership team must work together with the employees in order to understand the appropriate actions to systematically elevate the performance of the organization while maintaining stability and control.

5. Repeat the Process

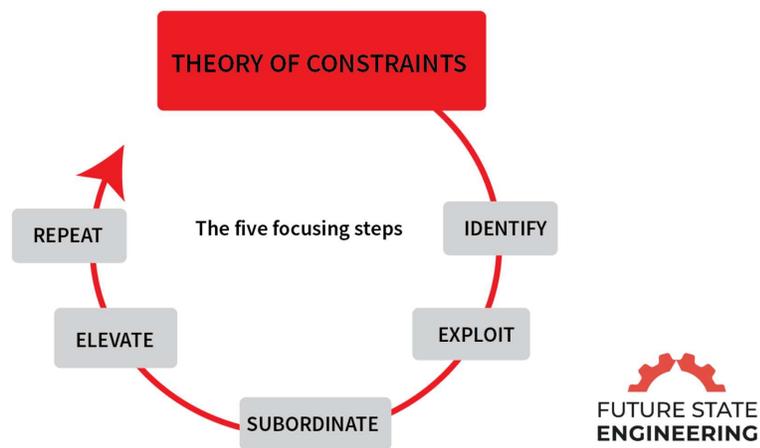
The fifth step is: If the constraint is broken go back to step one, and don't let inertia become the constraint. Inertia can be defined as resistance of any physical object to any change in its velocity, which can be translated into organizations becoming complacent after implementing the five focusing steps the first time and then the rate of improvement begins to decelerate at an accelerated pace.

In most cases, implementing the 5 focusing steps will lead to breakthrough improvement results. Therefore, to prevent inertia from becoming the constraint, the organization should consider doing the following:

1. Build accountability into processes so when processes are improved, the improvements can be sustained without backsliding;
2. Develop the right Key Performance Indicators (KPI) to monitor the vital signs of the organization in a timely fashion (recommend weekly);
3. React quickly to changes in the KPIs that are counter to the established goals of the organization;
4. Engage the workforce in problem solving and in active participation in improvement activities.

Doing these will allow for making the five focusing steps a circular mechanism, focused on continuous improvement.

Thank you for reading.



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