

## Theory of Constraints: an overview

The Theory of Constraints (TOC) is a comprehensive management approach that offers proven tools and techniques. Combining methods from the “hard” exact sciences with both intuition and common sense, TOC systematically challenges conventional rules. Applying the Theory of Constraints results in changing at least one paradigm. That explains the amazement expressed at results achieved in the last thirty years.

### Benefits

Your company or organisation, no matter what industry, stakeholder or size, can profit from applying TOC. You will be helped to:

#### Overall

- derive more profit (if that is your objective) from your valuable resources
- avoid depleting your resource capital by the application of pre-vailing cost-cutting approaches
- make changes and investments only in those very few places where they are absolutely necessary, allowing you to focus your resources and the use of other methods like Six Sigma, TQM, LEAN or JIT to those areas where they are really effective
- make sure, the changes you are planning won't have unexpected negative effects on other parts of your organisation
- gain buy-in from your employees to implement the changes
- propagate changes throughout the company quickly and effectively

#### Finances and Measurements

- develop metrics and management accounting procedures that are simultaneously simpler and more effective than the current norm
- implement these procedures in such way that sub-divisions or individual units in the supply-chain are steered by your organisation's global aims

#### Sales and Marketing

- use these simpler metrics for clear calibration of the input into decisions on your product-mix
- price product to your customers' higher perceived values, segment the markets correctly and make profitable use of available capacities
- position your products and services to solve your customers' most acute needs, thus providing your company with a useful competitive edge
- use your improved capacity in operations and logistics to win market share

#### Operations and Logistics

- increase due-time deliveries to very close to 100%
- decrease inventory, lead-time and cycle-time drastically
- increase revenues by two to three digit percentages

## Project Management and Engineering

- cut project time by more than half while reducing costs – with no compromises in quality or content
- drastically reduce time to market

## Managing People

- solve problems at the root instead of being continuously forced to fight fires
- harness the creativity of your employees, as well as their critical minds, to develop and implement outstanding solutions
- solve conflicts between employees to the complete satisfaction of both sides

## The origins

Like so many discoveries that made a great impact on our way of life, the Theory of Constraints owes its origin to a mere coincidence: A producer of chicken coops had problems delivering his products in due time. His complaints compelled a research physicist friend to analyse his operation. The physicist, not being familiar with the concepts of economics and thus unprejudiced, applied the concepts of the “hard” exact sciences to come up with a solution that worked beautifully but went against the rules commonly applied in economic environments.

The physicist – Dr. Eliyahu M. Goldratt – was so fascinated and motivated by this new domain that he devoted himself to systematically research it. In the last thirty years, together with a team of experienced practitioners, he developed the methods and applications integrated into what came to be called the “Theory of Constraints”.

## Why “Theory ...”?

For scientists the term “Theory” is not the opposite of “Practicality” but a system of knowledge based on verifiable observation and experience. Those who have experienced the impact of TOC on the reality of their company will easily agree with the 19<sup>th</sup>-century French mathematician Henri Poincaré, that “Nothing is more practical than a good theory”.

## “...of Constraints”?

The term constraints stems from the Systems Theory as applied in physics: A system is a set of interdependent functions, which transform input into output. A constraint is defined as one of the very few factors limiting the performance of the system, similar to the weakest link in a

## Generic TOC Maxims

- **Global instead of local optima:** Measure the parts of a system so that they add to the whole of that system
- In an interdependent chain of functions, **only one function can be used productively to its maximum capacity.** All other functions need to have sufficient reserve capacity, i.e. idle time is viewed as a necessity and not as a cost-factor
- **Check existing** (both written and unwritten) **rules:** Are they still in line with the current realities?
- Problems that persist over a long period of time are always **caused by an underlying dilemma**
- **Any dilemma can be solved** if we step back and question our assumptions about reality
- **Keep focussed,** avoid multi-tasking

Norm 16.4.04

<sup>1</sup> zu deutsch ungefähr «Engpasstheorie»

chain. Applying this to human systems, TOC uses the constraints as...

### Leverage points for efficient and effective change processes

Any changes made on the constraint will influence the whole organisation. So, provided you

know what the goal of your organisation is and how its output can be measured, TOC offers a clearly defined process for continuous improvement

#### ... in five steps:

##### Identify the system's constraint:

Where does the actual constraint lie? Inside the company? With your suppliers? In the market demand?

##### Decide how to exploit the system's constraint

How can we make the most of our bottleneck machine, function or department? What rules or habits are preventing us from making the best use of the constraint? What causes us to lose sales (e.g. long lead-times)?

##### Subordinate everything else to the above decisions

All relevant working processes, rules and measurements need to be checked and adjusted to support the decisions taken in step 2

##### Elevate the system's constraint

Educate or employ more workers with skills required; change those rules and habits that prevent the taking of necessary actions; increase the capacity of the constraint machine(s)

##### Go back to step 1

Never allow inertia to become the system's constraint. If, in the above steps, a constraint is broken, go back to step 1.

### References

Judge for yourself on the successes already achieved through the implementation of TOC by visiting the the Goldratt Marketing Group (GMG) website at:

#### [www.toc-goldratt.com](http://www.toc-goldratt.com)

There you will find a reference bank with numerous case studies, often including the name of a company contact. Or you can ask for references geared to your specific situation from the contact person given below.

#### More about TOC

You can also find TOC books and multimedia at:

#### [www.bzio.ch](http://www.bzio.ch)

as well as information on the services and training offered by the Goldratt Implementation Group and a guide for your first steps into the various applications of the TOC.

**Hampton Conservatories Ltd.**, N. Ireland  
[www.hamptonconservatories.uk.com](http://www.hamptonconservatories.uk.com)  
Design, manufacture and installation of high end bespoke (custom made) hard wood conservatories

Implementation of Critical Chain Project Management. Number of projects in progress dropped to one third, remarkable improvement of overall project lead times, on-time performance and quality.

Employees:	30
Revenue:	4 Mio €

#### Results of TOC Implementation, (February through December 2001):

Throughput:	+100%
Inventory:	-70%
On-Time performance:	from 60% to 90%
Lead Times:	-50%
Projects in process:	from 10 auf 3

Quelle: TOC Reference Bank, [www.toc-goldratt.com/interna.php?sec=6](http://www.toc-goldratt.com/interna.php?sec=6)

## Training and Education

There are many training opportunities available, ranging from multimedia and self-education books, to inhouse or open training courses and personal coaching, to formal educational programs for standardised TOC-applications.

## Implementation

After sufficient training, you will be able, by yourself, to implement TOC in specific areas of your company by yourself. To avoid risk and for faster results, coaching or facilitation by an experienced TOC-practitioner is advisable.



**Goldratt  
Implementation  
Group**

*The Goldratt Implementation Group (GIG) offers simple solutions for direct remarkable and lasting improvement of your bottom line by applying TOC.*

*Through GIG you can profit from more than 150 years collective experience in TOC.*

*For more information contact:*

**[www.gig-europe.com](http://www.gig-europe.com)**

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