



# ***1. TOC Local Operational Indicators – LOI***

***Aligning Direction and Motivating People***

## ***2. TOC Money Buffers***

***For the TOC Logistical Solutions***

***Oded Cohen***

***TOC Strategic Solution***



## Oded Cohen

Oded has nearly 35 years of experience in developing, teaching and implementing TOC methodology, solutions and implementation processes working directly with Dr. Goldratt all over the world. Among the countries to which Oded brings his expertise are the USA, Canada, Japan, India, China, the UK, Poland, Russia, Ukraine, Colombia, Chile, Peru, Turkey and many others.

Oded has authored multiple TOC articles and contributed to numerous TOC books.

Oded is the author of *Ever Improve – A Guide to Managing Production the TOC Way*, published in June 2010. Oded co-authored the book *Deming & Goldratt: The Theory of Constraints and the System of Profound Knowledge – The Decalogue*.

Together with Jelena Fedurko Oded has co-authored the book *Theory of Constraints Fundamentals*.

Oded is Founder and Co-President of the International Alliance of TOC Practitioners – TOCPA.



[oded.cohen.gs@gmail.com](mailto:oded.cohen.gs@gmail.com)

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

[www.tocpractice.com](http://www.tocpractice.com)



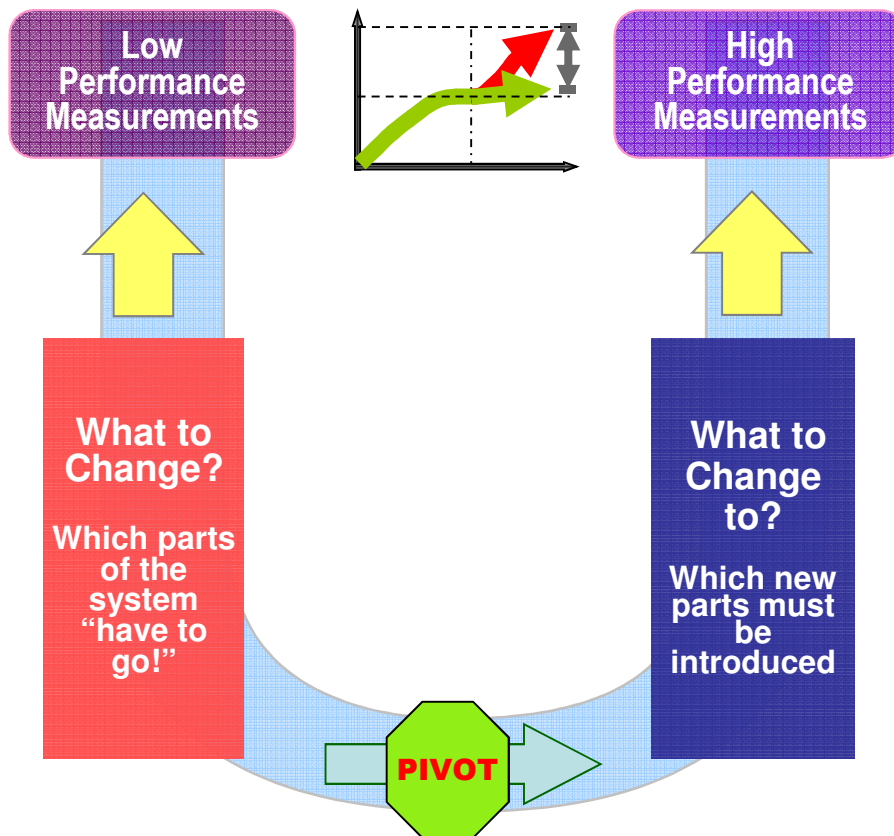
# **1. TOC Local Operational Indicators – LOI**

- 1.1 The basic TOC approach to measurements and managing performance**
- 1.2 Why do we need indicators?**
- 1.3 How use TOC to develop LOI**
- 1.4 How to manage using LOI**



## 1.1 Basic TOC Approach

### *The purpose of measurements*



#### Performance Measurements must:

- Provide yardstick to state how well the system is performing
- Provide a bridge to check the impact of local actions and decisions on the global performance of the system

In the current reality – the level of performance is unsatisfactory  
Or  
There is a strong belief that the performance can be significantly higher



## 1.1 Basic TOC Approach

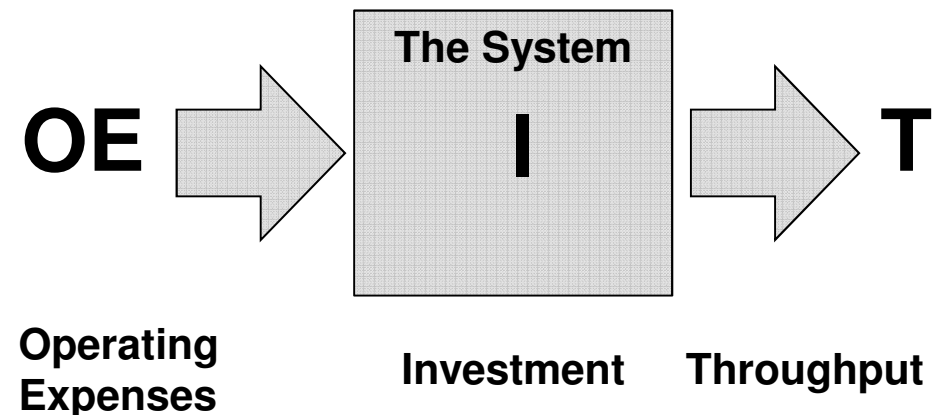
### *Measurement for the company*

For profit: **NP ROI**

The bridge is: **T I OE**

*“To become an Ever  
Flourishing Company, its  
T must grow (and  
continue to grow) much  
faster than OE”*

Dr. Eli Goldratt



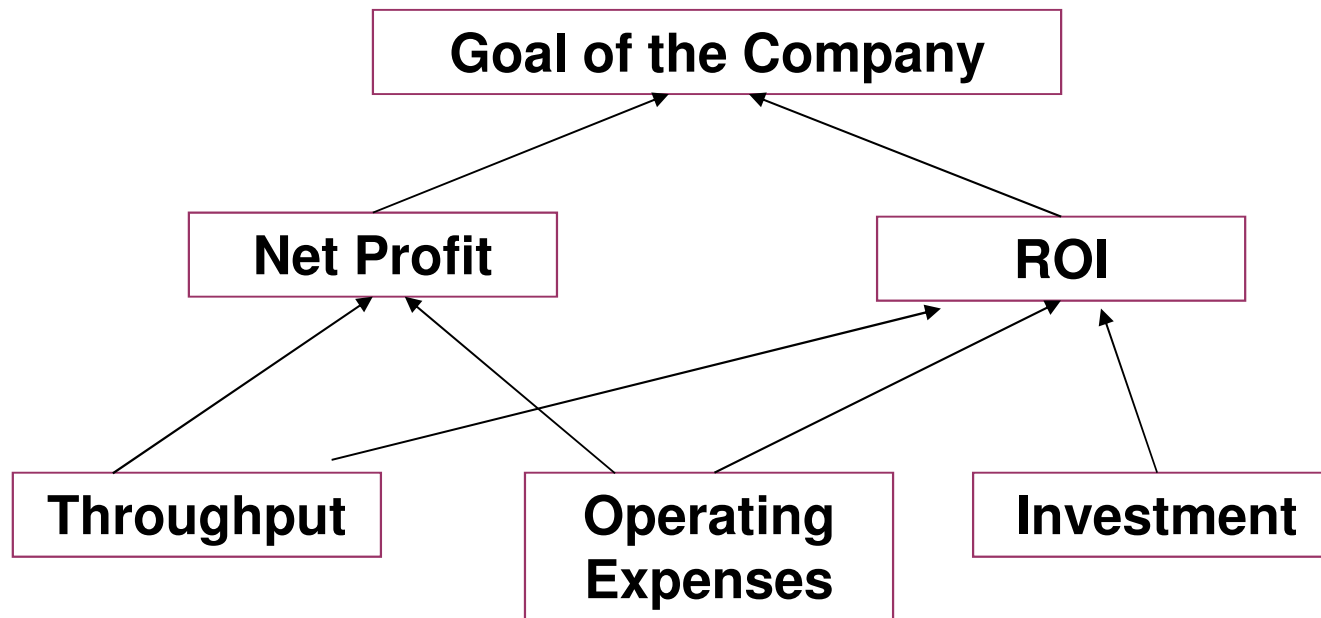
- $NP = T - OE$
- $ROI = (T - OE) / I$



## 1.1 Traditional TOC Approach

### *Measurement for the company*

## Hierarchical Structure of Top Measurements





## 1.2 Why Do we need Indicators

T-I-OE provide the bridge between decisions and actions to the bottom line of the company. Yet:

1. They do not cover all aspects of what is needed to be done.
2. They may be too high level, cannot be specific for a department or section within the a department.
3. T-I-OE can be a language for high level managers but it is not good enough for middle and first hand managers.
4. It may be difficult to translate T-I-OE to the practical aspects for employees and operators.

Therefore, there is a need to provide the workforce with a set of **Local Operational Indicators - LOIs** that will help them to focus, take the right actions and to be sure that they are aligned with what is good for the company.

**The LOI should be developed on a department/function level (and cascaded down to lower sections) and assigned to the relevant managers!**





## 1.3 How to use TOC to develop LOI?

### Potential LOIs

1. LOI should be a subset of the performance measurements of the logistical solutions of TOC (MTO, MTA, DTA and CCPM) – as presented at the top of the U-shape.
2. We should measure the LOE – Local Operating Expenses that are used in order to perform the duties of every department.
3. We can measure the quantifiable level of achieving DE – Desired Effect that replaces a major UDE.

For example: UDE: Too much Overtime

DE: Level of Overtime is planned and controlled.

The LOI is ***the recorded amount of OT versus what was planned***

4. As LOI we can set necessary conditions that must be achieved in order to generate Throughput.  
For example ***quality, uptime of machines, level of service to production***, etc.
5. Other LOIs can be also identified through the Buffer Management Analysis of the major causes for disruptions to the flow. For example – ***lack of tools and jigs***.





## 1.4 How to Manage Using LOI?

### LOIs should be checked against expectations.

Some guidelines:

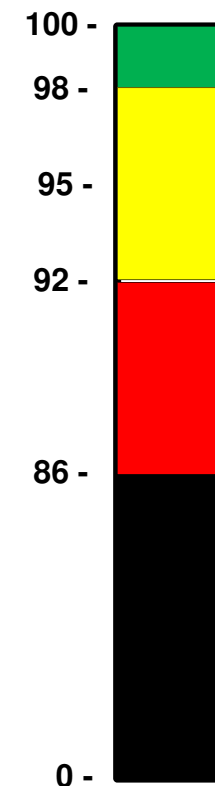
1. The number of LOI per department/sections should be reasonable (no more than 10). Too many LOIs can cause defocusing or arbitrary choice of where to focus.
2. There must be a clear hierarchy of the LOIs. Some are more critical than others.
3. Every LOI should have a scale (ideally numerical). The full range of scale should be marked with three major zones – Green (Good), Yellow (Midway) and Red (potentially in danger). Additional zones: Deep Red (Black) should denote bad situations and in some cases another zone - Blue – for outstanding good performance.
4. There should be an overall department score which reflects the weight of the different LOIs.
5. Management is done along the lines of responding to the buffer status

Example

DDP  
(Intem)

Range:

0-100%

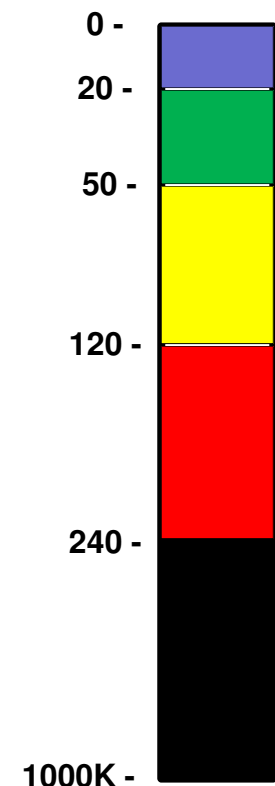


Example

Scrap

Range:

PPM (parts per million)





## ***2. TOC Money Buffers***

***For the TOC Logistical Solutions***



## **2. TOC Money Buffers**

2.1 Money Buffers

2.2 for Production Buffers – MTO

2.3 for Stock Buffers – MTA/DTA

2.4 for Project Buffers – CCPM



## 2.1 Money for Buffers - General

The financial performance of the company is predicted in the planning phase. However, the way of managing during the execution of the plan dictates what actually is achieved. Hence there are inherent conflicts – as reflected in the core clouds of each subject.

The TOC Logistical Solutions – MTO, MTA, DTA and CCPM focus on managing the flow. The top priority is given to the logistical commitment: on time delivery and availability.

Yet, the logistical management must consider the financial impact of their decisions. Any activity that deviates from the “standard” (what has been put in the budget) causes to increase the expense. To reduce the financial clash all TOC solutions give early warning through buffer status. Nevertheless, most corrective actions demands extra money.

To handle this issue we suggest to add to the logistical buffers – time and stock, also the **Money Buffers** for managing flow.



## 2.2 Money Buffers for Production Buffers – MTO

MTO has a Production Buffer - it is a Time Buffer to give early warning to management to ensure that the Work Order is not blocked and to take actions that are not that expensive and to complete the order on time.

Yet – MTO-Injection 4 demands from management to take recovery actions. In most cases these actions increase OE and in some cases reduce Throughput (like by purchasing more expensive RM or components).

To ensure quick reaction for MTO-Injection 4 – we suggest giving Production Management a **Money Buffer**. This is an amount of money that is allocated to production and allows them to finance the recovery actions.

MTO-Injection 4 has a forum (such as the daily production meetings) for making decisions for the recovery actions. When a resolution for recovery action is made – the amount of expense it needs is withdrawn from the money buffer.

The amount of money in the buffer should be sufficient to cover a pre-determined period (month, quarter or a year).



## 2.2 Money Buffers for Production Buffers – MTO

### Determining the size of the Money Buffer

Many companies have statistics of deviations from standard. These statistics present the amount of money that was paid out as compared to the set budget.

Usually, the deviation is negative – which means that the amount that was spent was larger than the amount that was budgeted.

We suggest to set as an initial value of the Money Buffer to be:

**50% of the typical Negative Deviation per the period the Money Buffer is set for.**

Once the money buffer is set – it is subject to buffer management with the three zones G-Y-R – as if it was a Stock Buffer (of money).

### Buffer Recovery:

- Any positive variation should be credited back to the money buffer.
- If the money buffer goes to red – the issue must be escalated to higher management for consideration of “Topping up” the buffer with one-off sums.



## 2.3 Money Buffers for Stock Buffers – MTA/DTA

MTA has **Stock Buffers** - every stock buffer is measured in number of units. Not in money!

Production Management is committed – through MTA-Injection 1 – to availability with no excess stock.

MTA-Injection 2 determines the level of stock in the system based on the known (assumed) performance. The size of the stock buffers determines the amount of money that is attached to the system by design.

Having the stock buffers helps to determine the budget for the system.

However, the reality is bound to be different from what is planned.

We can expect two types of variations:

1. **DBM** – Dynamic Buffer Management may call for increase in the buffer size. This will demand additional expenditure for producing the extra volume (RM, and additional OE). This can be offset by the reduction in another SKU stock buffer, but not fully.
2. **MTA-Injection 4** – instruct management to take recovery actions. These actions may demand extra money.

One common money buffer that covers all stock buffers in the system will help to address and control these extra costs





## 2.3 2.3 Money Buffers for Stock Buffers – MTA/DTA

### Determining the size of the Money Buffer

The purpose of the money buffer is to finance the actions that need to take the on-hand buffer out from the red zone before shortages happen.

In setting the buffer size, there is a need to consider two portions:

1. **Money for MTA -Injection 4** – to finance recovery actions. This portion should be handled like the money buffer of MTO.
2. **For DBM** – there is a need to establish a buffer due to the mismatch between the plan and the unfolding reality. As MTA is a new feature – for the calculation of the initial size of money buffer there is no historical data to support the calculation of how much money should be put in the money buffer.



## 2.5 Money Buffers for Project Buffers – CCPM

CCPM has several types of Buffers. The major ones are FB and PB

Even though these are Time Buffers that are inserted in order to protect the on-time delivery of the project, these buffers also contain money aspect.

The time estimation of the task duration, according to CCPM-Injection 2, is “challenging but achievable”. (Also called the 50/50 time). This means that there is 50% chance that the task will take longer than estimated. If the total actual duration is larger than estimated there is a need to finance the additional days of the task.

For that the project should have Money Buffers. The size of Money Buffers should be based on two elements:

1. **Money for financing the tasks that need more time than estimated.** This part can be estimated by taking 50% of the estimated cost of the CC or the corresponding Feeding Chain
2. **Money for financing recovery actions** – the estimation can be based on historical data of deviations from project budget (no more than 50%)

Money Buffers should be monitored regularly. When the level of money is reduced to the Red level – management should take recovery actions or escalate to top management.