

THE GOAL

Dr. Eliyahu Goldratt

Theory of Constraints

Israeli physicist turned
business consultant,
Originator of the
Theory of Constraints

DR. ELIYAHU GOLDRATT

His famous **books** are:

The Goal,
Its Not Luck,
Critical Chain,
The Haystack Syndrome

The Theory of Constraints (TOC)

is an overall management philosophy that aims to continually achieve more of the **goal** of a system.

The Theory of Constraints

A constraint can also be defined as a **BOTTLENECK** of a system

The flow at the
Bottleneck will
determine the
overall
THROUGHPUT
of the system



The Theory of Constraints

Like a chain with its weakest link, in any complex system at any point in time, there is most often only **one aspect** of that system that is limiting its ability to achieve more of the goal.



The Theory of Constraints

In order to let that system attain any significant improvement, that constraint must be **IDENTIFIED** and the whole system must be managed with it in mind

MURPHY'S LAW

If anything can go wrong,
it will..

If there is a possibility of several things going wrong, the one that will cause the most damage will be the one to go wrong

If anything just cannot go wrong, it will anyway

If everything seems to be going well, you have obviously overlooked something

MURPHY'S LAW

In nature, nothing is ever right.

Therefore, if everything is
going right ,

something is wrong..

For more details, you can read,

Source: http://en.wikipedia.org/wiki/Murphy's_law

The Goal of any
Manufacturing Company
is to make

MONEY

Three important factors in a company are:

THROUGHPUT

(money coming **in**)

INVENTORY

(money currently **inside** the system)

OPERATING EXPENSES

(money to be **paid out** to make throughput happen)

There are **two** kinds of
Events in a company:

DEPENDENT EVENTS

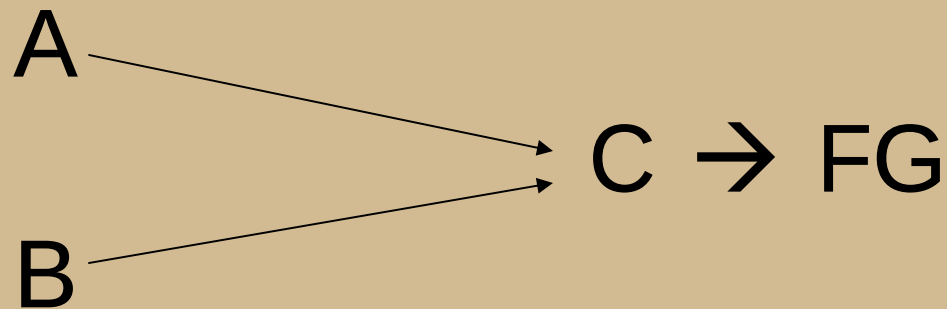
INDEPENDENT EVENTS

Types of Plants:

I – Plant: Material flows in a sequence, assembly line

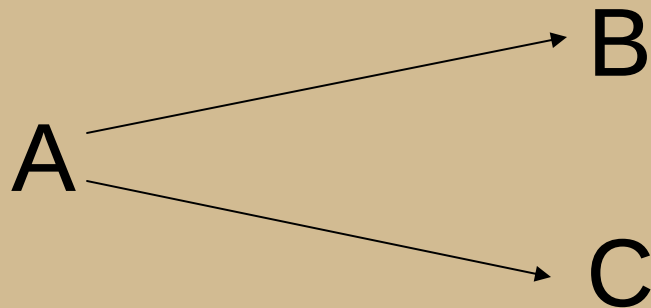
$A \rightarrow B \rightarrow C \rightarrow D \rightarrow E \rightarrow \mathbf{FG}$

A – Plant: Flow of material is many to one



Types of Plants:

V – Plant: Flow of material is one to many



T – Plant: General flow is like I and then split into multiple Is



Drum – Buffer - Rope

It is a manufacturing execution methodology.

DRUM – machine or operation that limits the ability of the entire system to produce more

Drum – Buffer - Rope

BUFFER – it protects the drum. It ensures that work keeps on flowing towards the drum

Drum – Buffer – Rope

ROPE – it is the work
release program for the
plant

Drum – Buffer - Rope

Impact of one variable on
another

You can move as fast as
the person ahead of
you.

CHANGE

the way you think production

capacity..

There are **two** kinds of
Resources in a plant:

BOTTLENECK RESOURCE

A resource whose capacity $\leq$ DEMAND

NON-BOTTLENECK RESOURCE

Can do its job in lesser time than a
bottleneck resource does. Hence . . .

BALANCE FLOW, NOT CAPACITY

Flow of item through bottleneck
equal to Demand from market

Look for short supply parts

.See the workflow.

RANK

WRONG ASSUMPTION

that you must make the
manpower work **more** and
produce 100% or else **get**
rid of them to save money

Total time spent by a material inside a plant from entry to exit can be divided into **four** elements:

SETUP

PROCESS TIME

QUEUE TIME

WAIT TIME

Most Important:

THROUGHPUT up

INVENTORY controlled

OPERATING EXPENSES low

DO NOT ALLOW

INERTIA

TO CAUSE A SYSTEM

CONSTRAINT

When you want to change something in the company, you must know **three** things:

WHAT TO CHANGE

WHAT TO CHANGE TO

HOW TO CAUSE THE CHANGE

WHAT TO CHANGE

Individual problems are addressed without looking at the broader picture

Local changes are made in a department without checking its effects on the larger system

So one must know
what to change?

WHAT TO CHANGE TO

Once the problem areas are identified, the next step should be the possible **long time** recourse. This might include changes in the **systems, structures & process** of the organization or function.

The Toyota Way

1. Base your management decision on a **long term philosophy**, even at the expense of short term financial goals
2. The right process will produce right results. Create a **continuous process flow** to bring problems to surface.
3. To get quality right the first time, Stop to fix problems
4. You should standardize tasks and processes which are the foundation for continuous improvement and employee empowerment.

The Toyota Way

5. Respect your extended network of partners and suppliers, challenge them to do better.
6. Go and **see for yourself** to thoroughly understand the situation.
7. Make decisions **slowly by consensus**, considering all options and implement decisions rapidly.
8. Become a **learning organization** through relentless reflection (hansei) and continuous improvement (kaizen).

HOW TO CAUSE THE CHANGE

This step includes a detailed **ROADMAP** to implement the change

The most important thing that one will have to overcome is

RESISTANCE TO CHANGE

HOW TO CAUSE THE CHANGE

1. Lack of agreement on the problem
2. Lack of agreement on the solution
3. No clear vision about its effect on the overall system, implications
4. Reservations about undesirable side effects (risks)
5. Obstacles like “We can’t do it”
6. Fear of the unknown

SUMMARY

1. Theory of Constraints
2. Murphy's Law
3. Goal of an Organization
4. Three Important Factors –
Throughput, Inventory &
Operating Expenses
5. Steps of Change
6. Toyota Way

Questions???

Ipshita

ipbasu@rediffmail.com, ipbasu@gmail.com