



# **13<sup>th</sup> International Conference of the TOC Practitioners Alliance - TOCPA**

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

May 21-22, 2014 Johannesburg, South Africa

## **Introducing in-between decision points to TOC's five focusing steps**

**Dr Pieter Pretorius**

**Full-time faculty**

**Gordon Institute of Business Science**

**South Africa**

**21 May 2014**



# Dr Pieter Pretorius

**Gordon Institute  
of Business Science**  
University of Pretoria

B.Eng (Industrial)  
CPIM  
MBA  
PhD (Engineering)  
Jonah

## Work Experience

- Lyttelton Engineering Works (1985 – 1989)
- Plessey (1989 – 1991)
- University of Pretoria (1991 – 2007)
  - Industrial Engineering
  - Engineering Management and GSM
- Freelance educator and consultant (2007 – 2014)
  - Gordon Institute of Business Science
  - NMMU Business School
  - NWU Engineering Faculty
  - UFS Department of Mining Geology
  - UP GSTM and CE@UP
- Full-time faculty at GIBS (since 1 April 2014)



Tel: 082 893-0477

Fax: 086 655-6386

E-mail: [pretoriusp@gibs.co.za](mailto:pretoriusp@gibs.co.za)



# The five focusing steps

- STEP 1: Identify the system's bottlenecks
- STEP 2: Decide how to exploit the bottlenecks
- STEP 3: Subordinate everything else to the above decision
- STEP 4: Elevate the system's bottlenecks
- STEP 5: If, in a previous step, a bottleneck has been broken go back to step 1

Goldratt and Cox (1992, 297)

...with the subsequent discussion to change *bottleneck* to *constraint* (op cit 303)



## Goldratt (1990, 82)

...the five focusing steps seem to give the generic decision process that enables us to climb the information ladder: from basic data to the next level, that of identifying the system's constraints, then to the higher level of deducing tactical answers, which finally leads to the financial bottom line information. What we should bear in mind is that the five steps by themselves are not sufficient. To actually climb the information ladder (*getting answers to our questions posed by the steps*) we have to develop detailed procedures that stem from them (*the five steps*).



# Constraint classification

- Goldratt (1990, 62-63, 93-99)
  - Physical and policy constraints
- Cox and Spencer (1998, 64)
  - Physical constraints require the 5FS
  - Function or policy constraints require the TP's
- McMullen (1998, 20-21)
  - Physical and thinking (policy) constraints
- Cohen (2009, 40)
  - Throughput and behavioural constraints



## Questions to answer

- Are the five focusing steps applicable to all types of constraints (Physical, policy and behavioural)?
- Are the five focusing steps as sequential in nature as is seemingly suggested?
- What are the decision points that will allow us to move from one step to the next (or earlier ones)?
- Why do we exploit and subordinate before we elevate?
- What is the ideal constraint location?



## Previous research

- Most publications refer to the five focusing steps in its classical format
- Youngman (2009) introduces one decision point
- Coman and Ronen (1995), Ronen and Starr (1990) and Floyd and Ronen (1989) are alluding to seven steps rather than five steps only
- The extra two steps are nothing new to TOC practitioners, I like to think of them as the prerequisites to the five focus steps:
  - Define the goal of the organisation
  - Define the measurements for achieving the goal

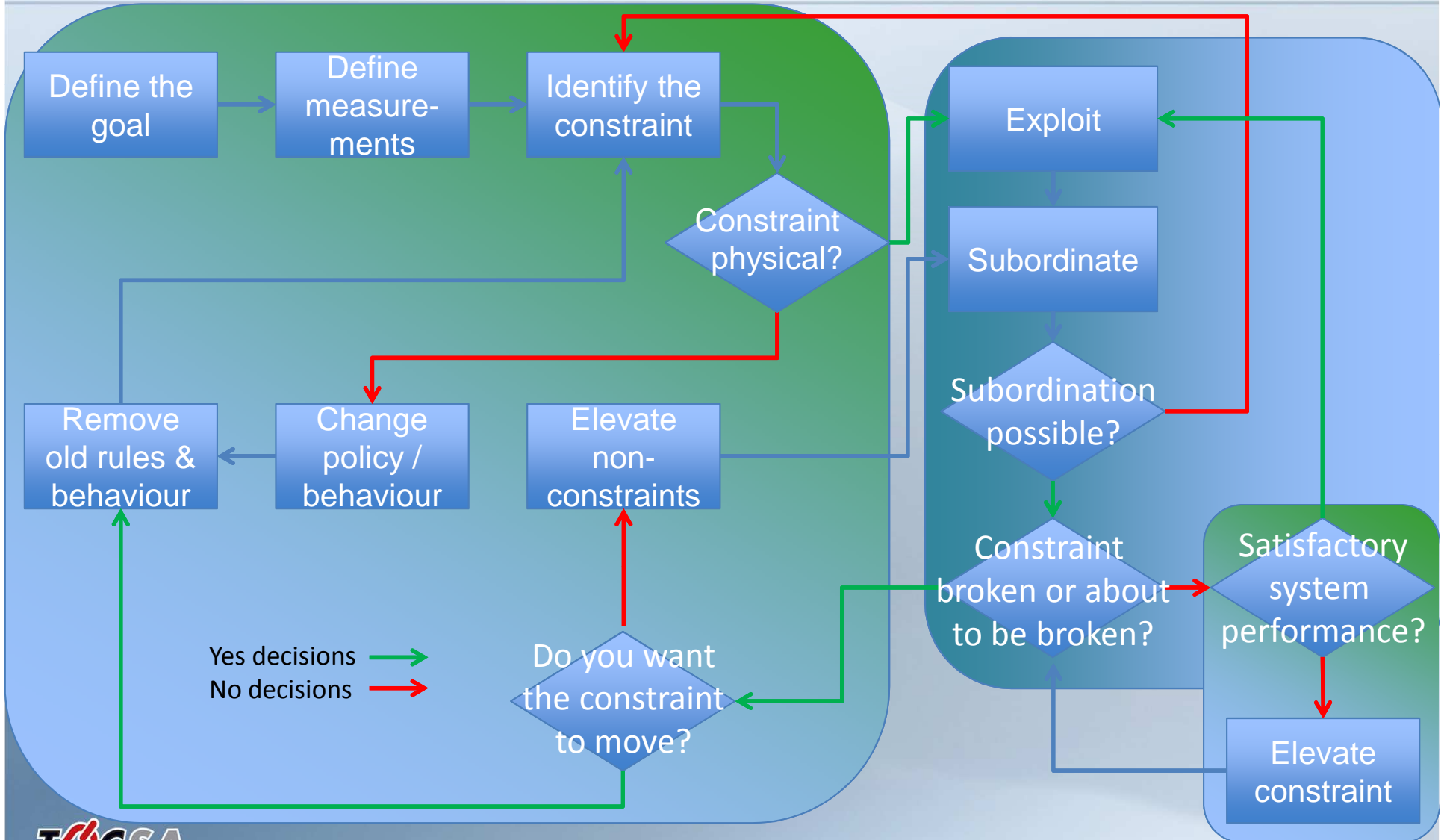


# The prerequisites

- Since an organisation is a system, and since organisations are goal seeking, one must define the goal of the organisation first. Without a defined goal, constraints cannot be identified, since a constraint is something that prevents/limits the goal achievement of the system
- In order to quantify existing levels of performance, as well as the effect of any intervention (through the five focusing steps) might have on organisational performance; appropriate measurements must be in place



# The 5FS with in-between decision points





## Questions answered

- Are the five focusing steps applicable to all types of constraints (Physical, policy and behavioural)? ✓
- Are the five focusing steps as sequential in nature as is seemingly suggested? ✓
- What are the decision points that will allow us to move from one step to the next (or the previous)? ✓



## 2 & 3 before 4

- Exploiting / subordination does not cost anything, elevation requires additional funding
- Exploiting / subordination does lead to immediate performance benefits, elevation takes time
- Sometimes when exploiting / subordination take place, the constraint can be broken without requiring any elevation, thus saving additional and often unnecessary expenses or investments on non-constraints



## 2 & 3 before 4 (cont)

- You might have the wrong constraint, which should not be elevated. The real constraint will show itself, since a constraint cannot be subordinated to a non-constraint
- Once exploiting / subordination has taken place, the real capacity of the organisation is known, allowing the size of the elevation to be decided
- Exploiting / subordination already improves organisational performance, which can be used to fund subsequent elevation of the constraint



# Ideal constraint location?

- True internal constraint (bottleneck)  
Better control and focus, but at the same time one would suffer from missed sales and unreliable supply to customers.
- Market constraint  
No missed sales, excellent reliability to customers, but an unhealthy exposure to market fluctuations and money spent on unutilised (and often expensive) capacity.

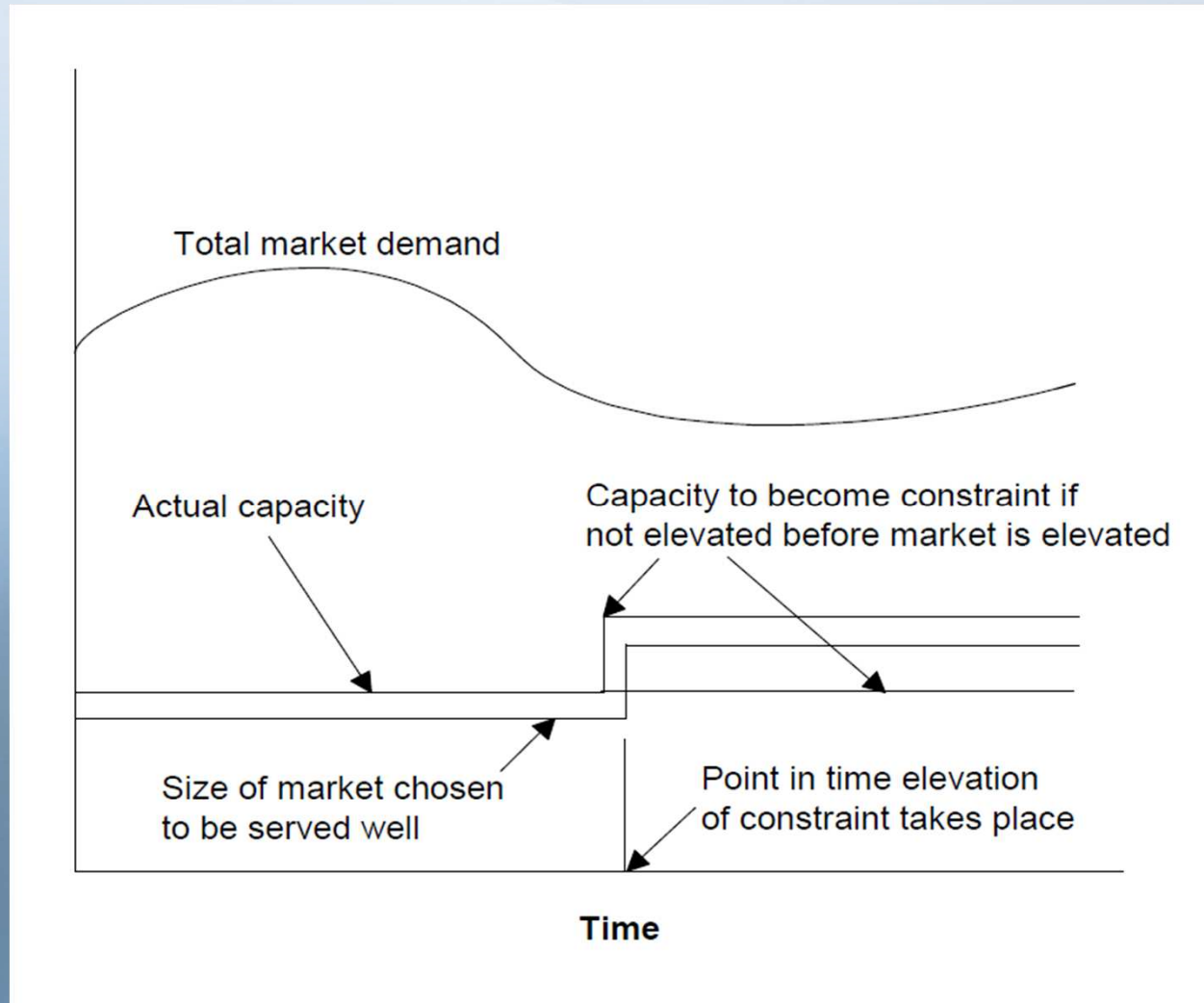


## **Choose the constraint as the size of the market you want to serve well**

- The overall market demand is much bigger than your own capacity
- You can generate more demand from the overall demand than the size of your capacity
- Know when to say no (before your CCR is fully loaded i.e. have protective capacity available on CCR)
- Philip Viljoen's talk at the 2013 SA TOCPA conference
- Oded Cohen's book published in 2009



# Size the input





# Advantages

- Customers experience a high service level (quality, reliability of supply, short lead times)
- The organisation is not exposed to statistical variation of market demand, and does not rely on forecasts for the short term
- Growth can take place whenever the organisation chooses, provided the total market demand is not exceeded.
- The constraint effectively never moves, since it stays in the size of the market chosen



## Questions answered

- Are the five focusing steps applicable to all types of constraints (Physical, policy and behavioural)? ✓
- Are the five focusing steps as sequential in nature as is seemingly suggested? ✓
- What are the decision points that will allow us to move from one step to the next (or the previous)? ✓
- Why do we exploit and subordinate before we elevate? ✓
- What is the ideal constraint location? ✓



## Article reference

- Print

Pretorius, P. (2014). Introducing in-between decision points to TOC's five focusing steps. *International Journal of Production Research*, 52(2), 496-506.

- Online

Published online: 16 Sep 2013

doi: 10.1080/00207543.2013.836612



## Sources

- Cohen, O. (2009). *Ever improve – A guide to managing production the TOC way*. Tallinn, Estonia: Published by the author.
- Coman, A., and B. Ronen. (1995). The enhanced make or buy decision: the fallacy of traditional cost accounting and the Theory Of Constraints. *Journal of Human Systems Management*. 14(5). 303-308.
- Cox, J.F. III, and M.S. Spencer. (1998). *The Constraints Management Handbook*. Boca Raton, Florida: St Lucie Press.
- Cox, J.F. III, and J.G. Schleier. (2010). *The Theory of Constraints Handbook*. New York: McGraw-Hill.
- Floyd, B., and B. Ronen. (1989). Where best to system invest. *Datamation*. November 15.



## Sources (cntd)

- Goldratt, E.M. (1990). *The Haystack Syndrome*. Croton-on-Hudson: North River Press.
- Goldratt, E.M., and J. Cox. (1992). *The Goal - 2<sup>nd</sup> Revised Edition*. Cape Town: Creda Press.
- McMullen, T.B. 1998. *Introduction to the Theory of Constraints (TOC) Management System*. Boca Raton, FL: St Lucie Press.
- Ronen, B., and M.K. Starr. (1990). Synchronized manufacturing as in OPT: From Practice to Theory. *Computers and Industrial Engineering*, 18 (8). 585-600
- Youngman, K.J. (2009). *The Five Focusing Steps – Structured and Strategic*. Accessed 16 February 2012.

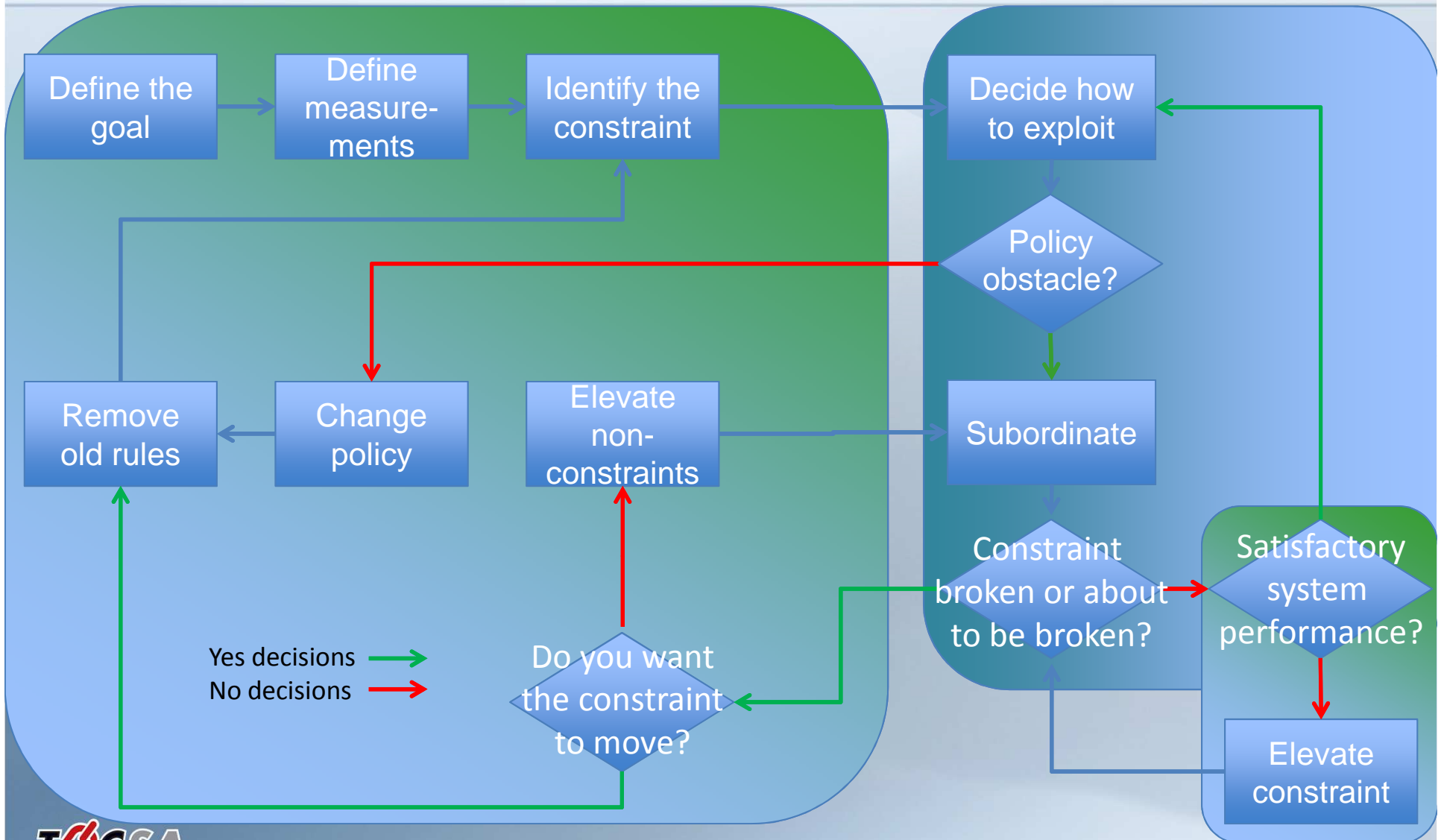
<http://www.dbrmfg.co.nz/Bottom%20Line%20Accounting%20for%20Change%205%20Step.htm>



# Questions?



# The 5FS with in-between decision points





## Alternatively....

- STEP 0: Remove all policy obstacles
- STEP 1: Identify the system's bottlenecks
- STEP 2: Decide how to exploit the bottlenecks
- STEP 3: Subordinate everything else to the above decision
- STEP 4: Elevate the system's bottlenecks
- STEP 5: If, in a previous step, a bottleneck has been broken go back to step 1