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TOC Practitioners Alliance - TOCPA
www.tocpractice.com
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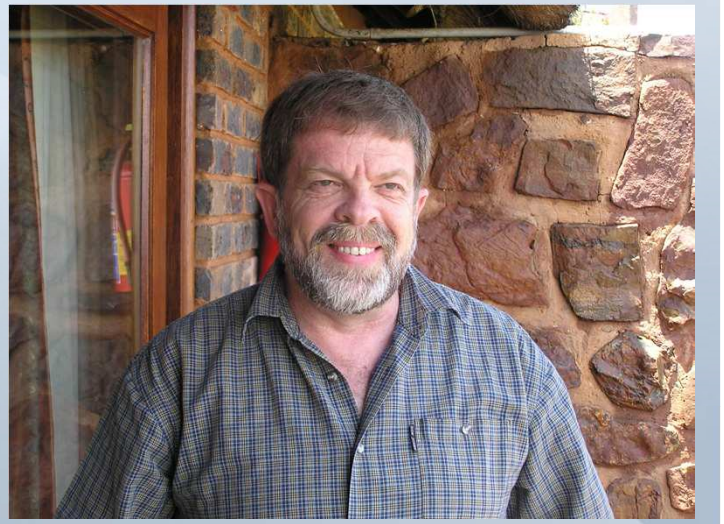
Reflections on the Origins of Cost World and Local Optima thinking in big Corporate Companies

Arrie van Niekerk, Tavanec CC, South Africa

21 May 2014

Arrie van Niekerk

Arrie van Niekerk obtained his B Eng (Metal) from the University of Pretoria in 1978 and was trained as Jonah in 1993 and Jonah-Jonah in 1998. He was the project leader for the implementation of TOC in more than 60 mines and 15 manufacturing companies in South Africa and has 15 years practical experience in this field.



His key strengths are:

- Recognized expert in the application of TOC applications
- Developed unique solutions for enhanced Production Flow in Mining
- Process facilitator on TOC and change management
- Skilled facilitator of Open Dialogue and Team Development as enabling processes

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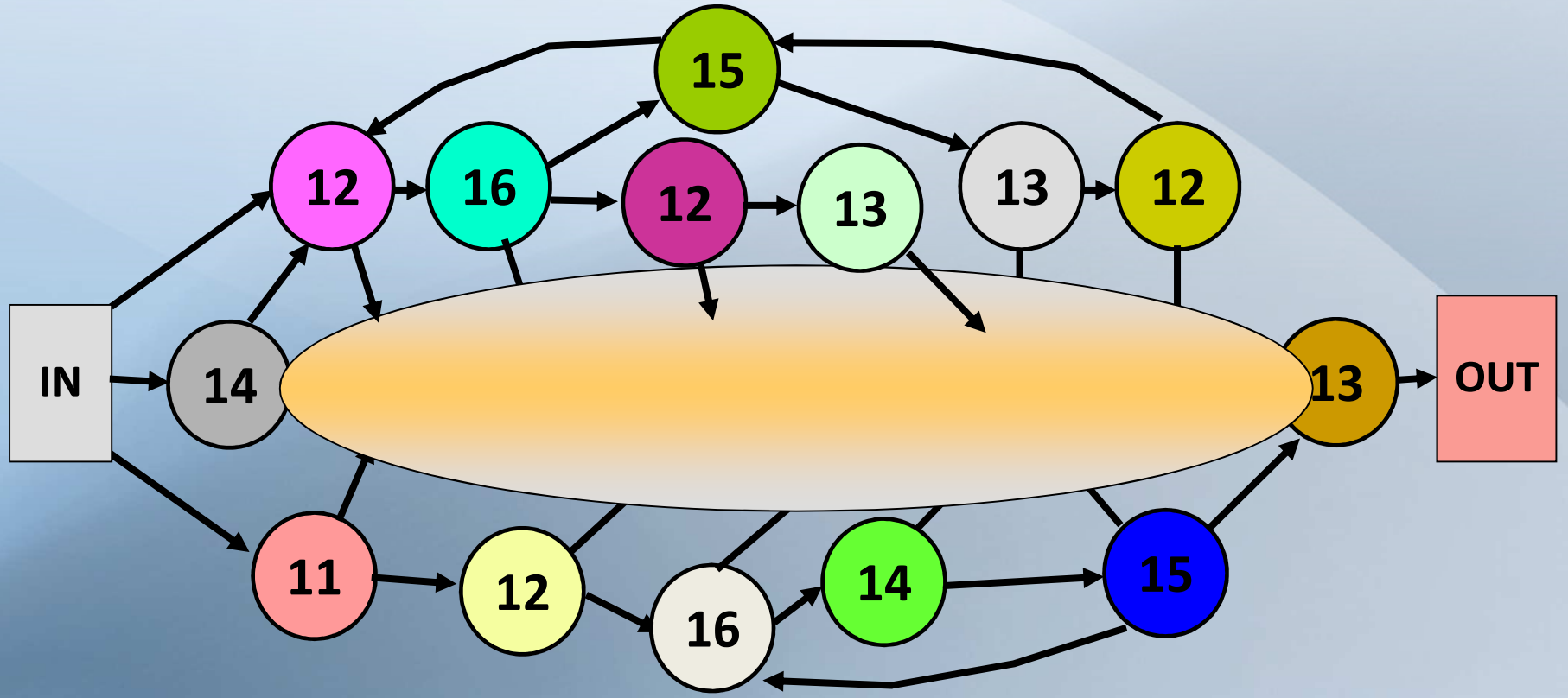
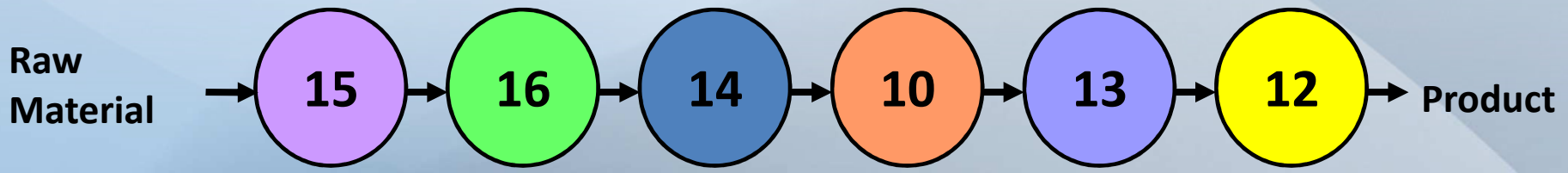
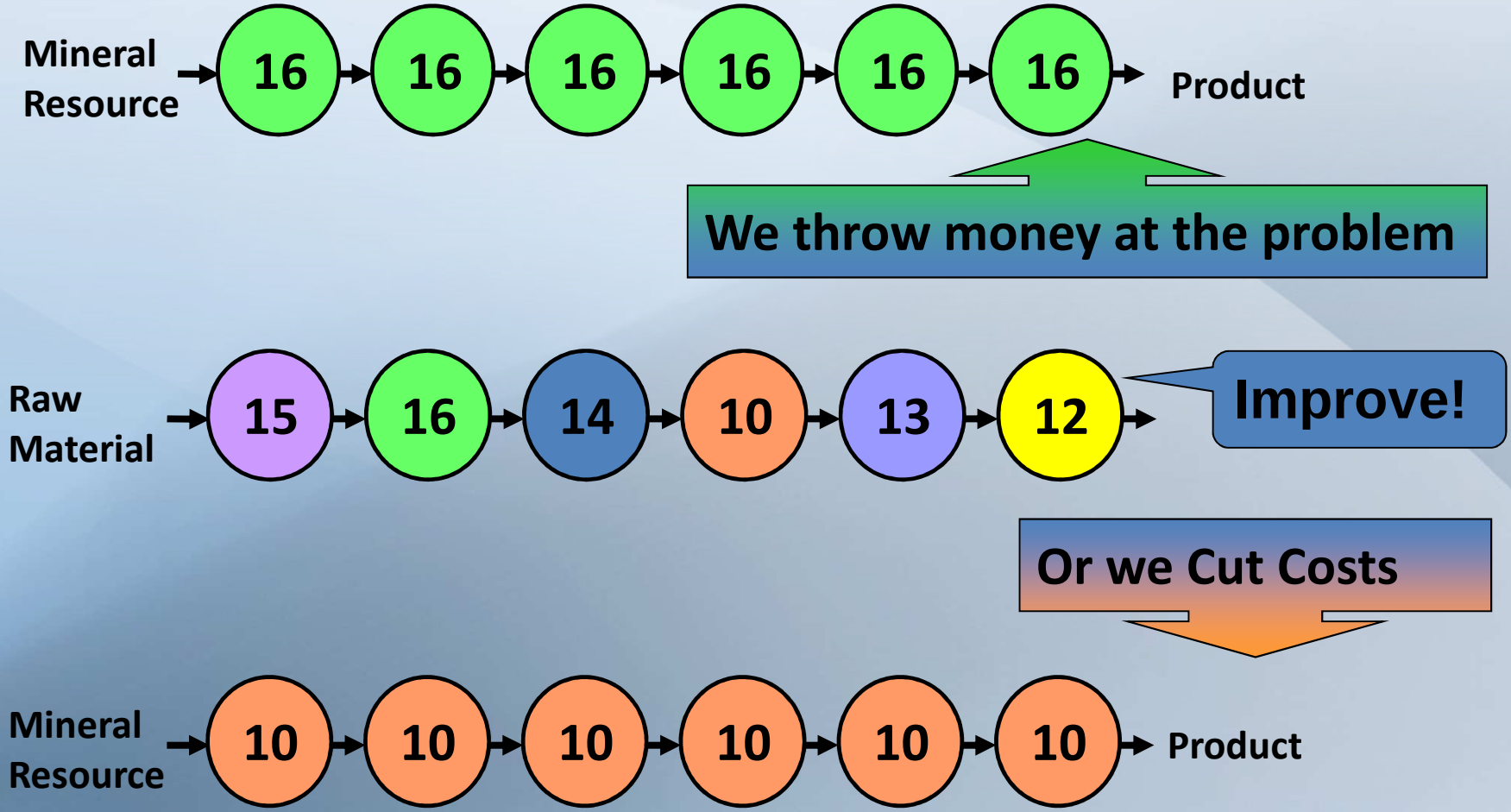
Complex Organisations



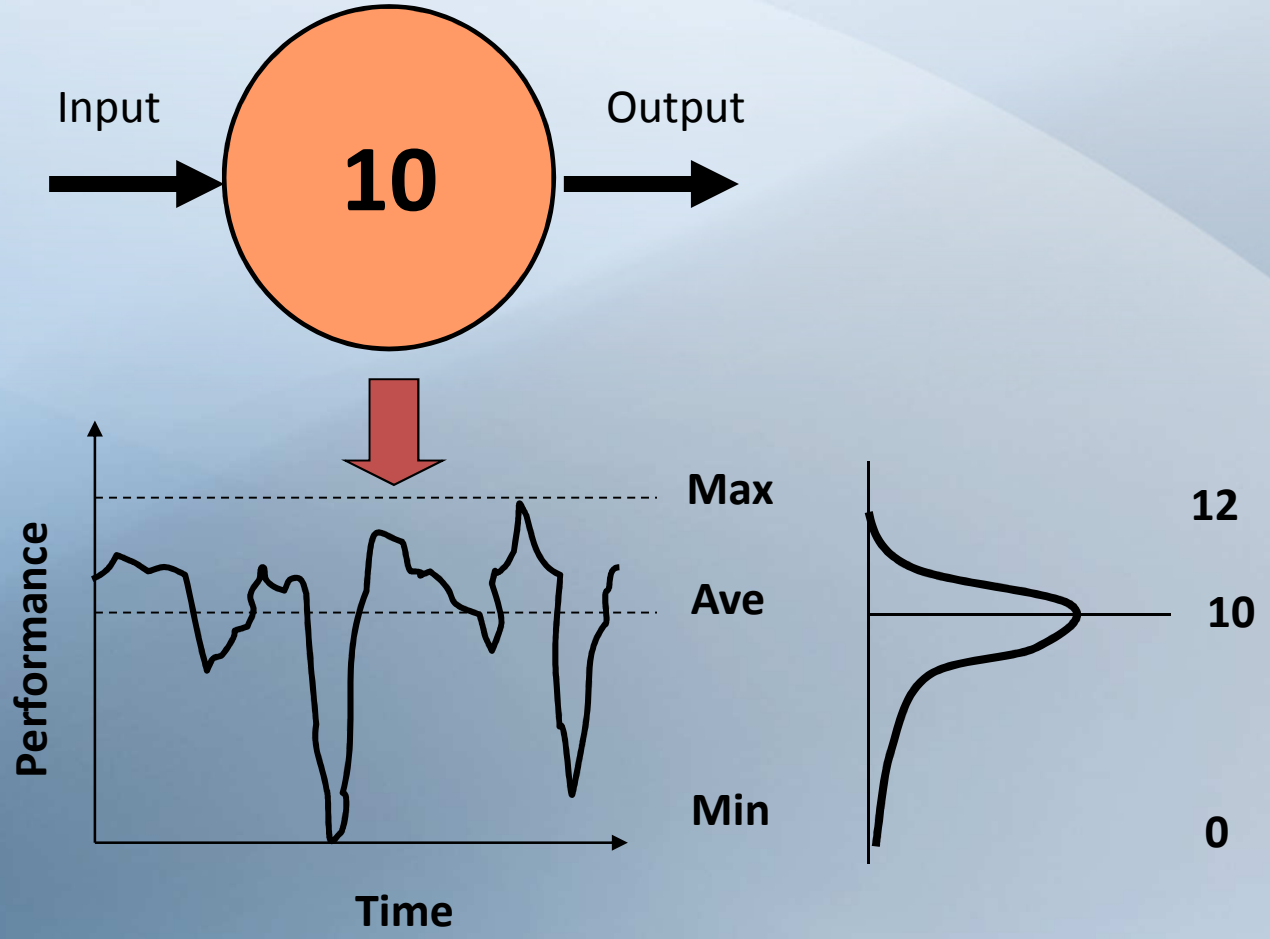
Unbalanced Chain



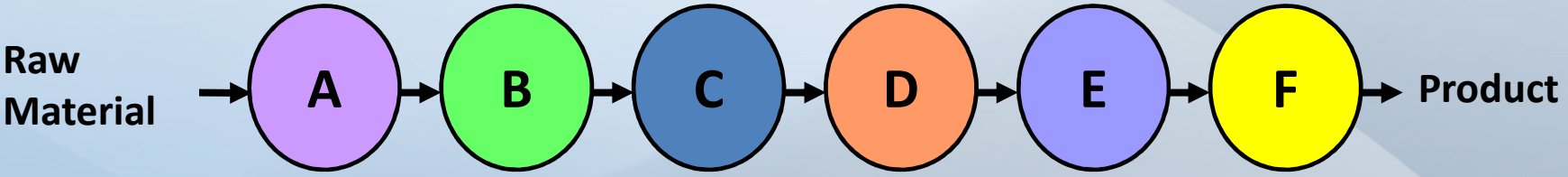
The Typical Approach to Improvements

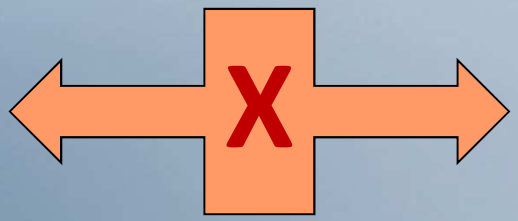


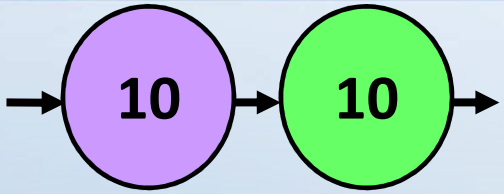
Scientific Fact 1



Scientific Fact 2



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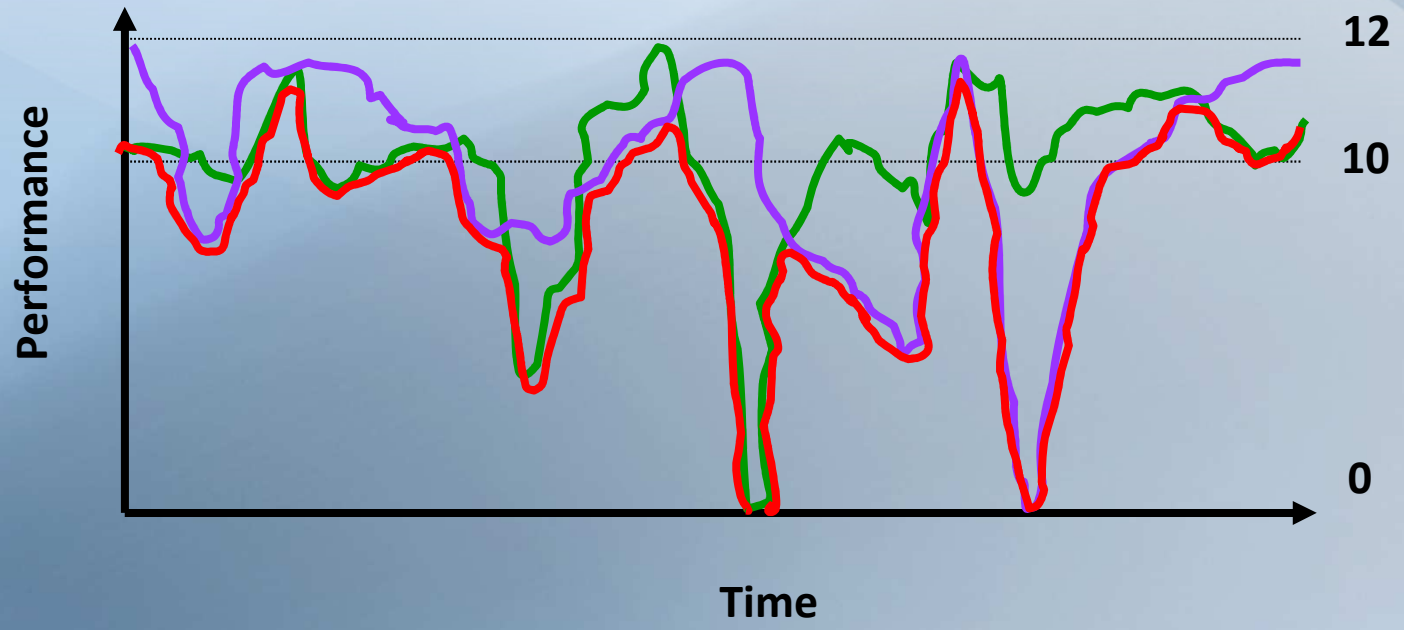
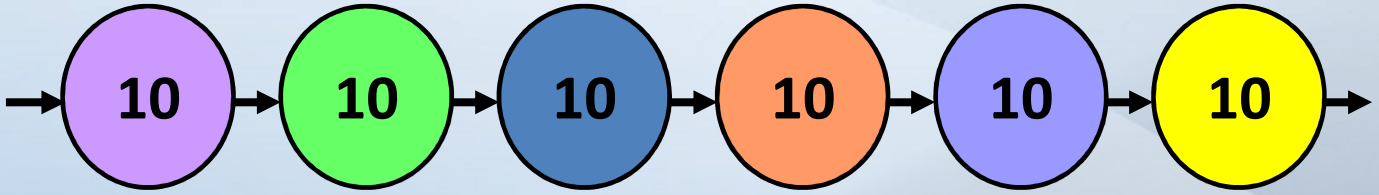
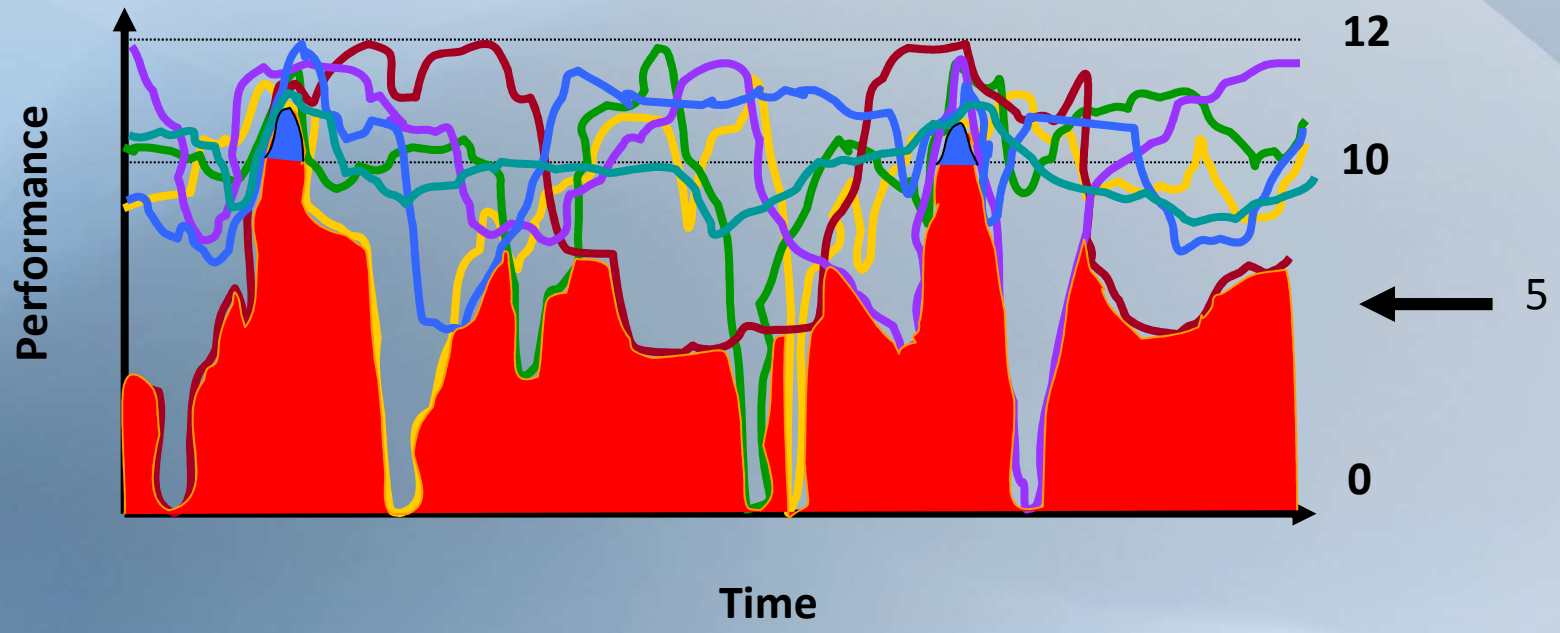
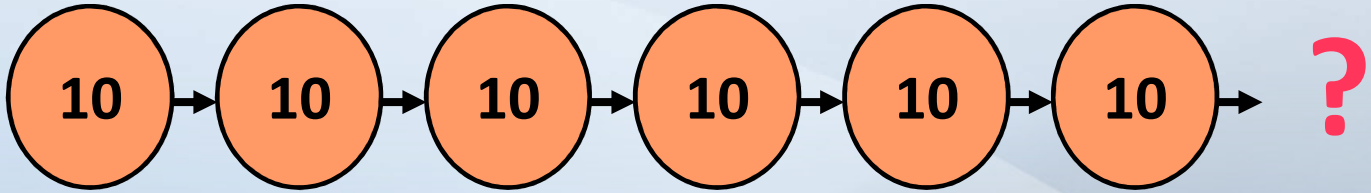

Performance
12
10
0
Time

Combined Effect of Variation & Interdependence





Actual Output?



Availability
94%

$(0.94)^6 = 73\%$

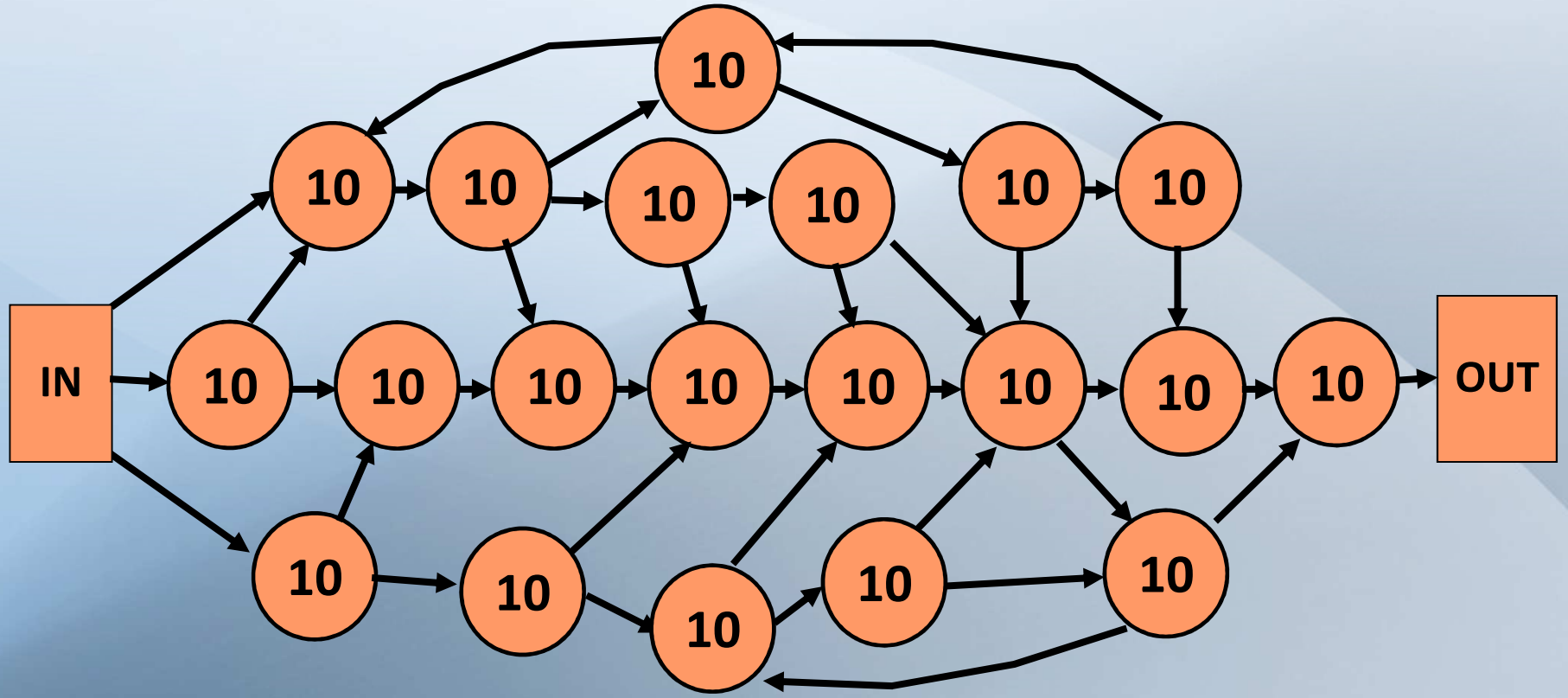
Availability
90%

$(0.90)^6 = 58\%$

Availability
80%

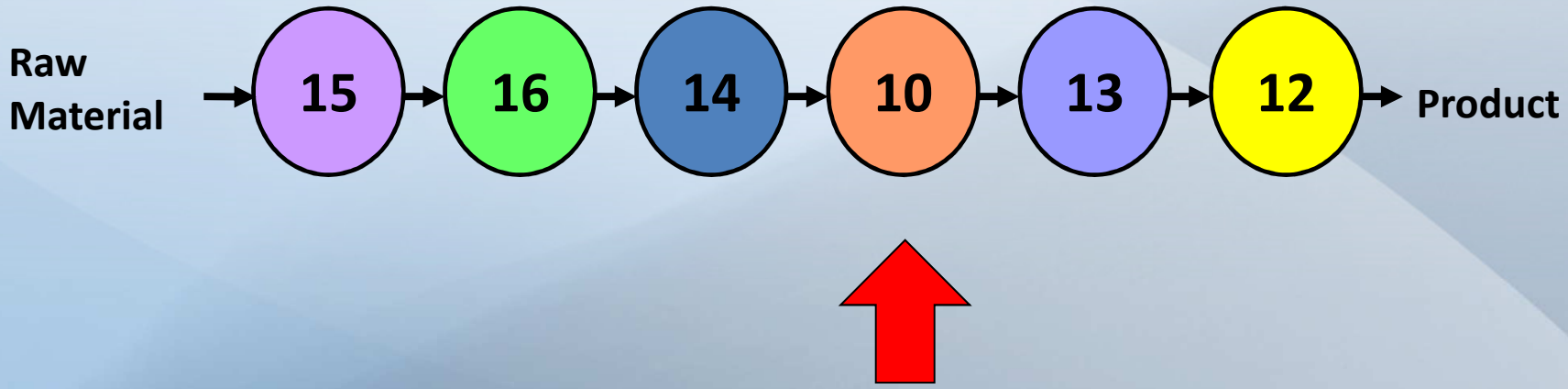
$(0.80)^6 = 31\%$

The Balanced Capacity Corporation

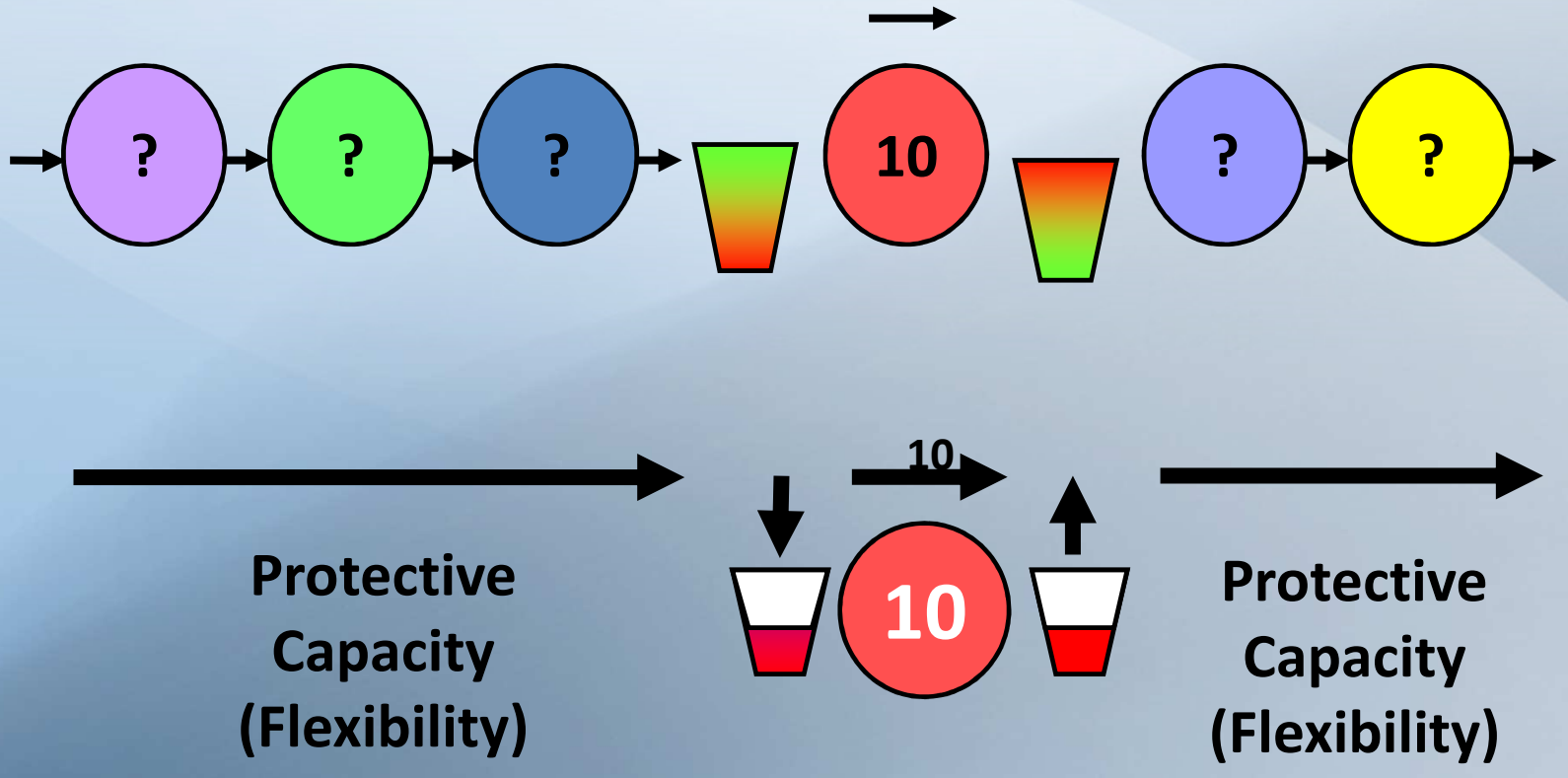


- **How much will this system produce?**

Bottleneck FLOW Principles



- One hour lost on the bottleneck = One hour lost for the total system, forever
- On the bottleneck, all the rules change!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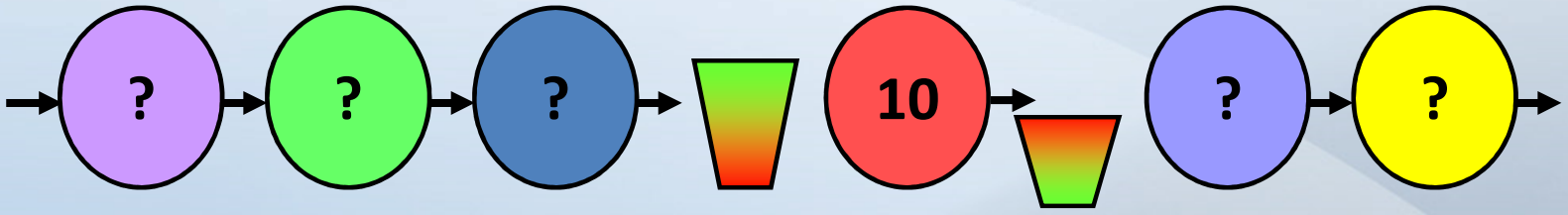
Protective
Capacity
(Flexibility)
Protective
Capacity
(Flexibility)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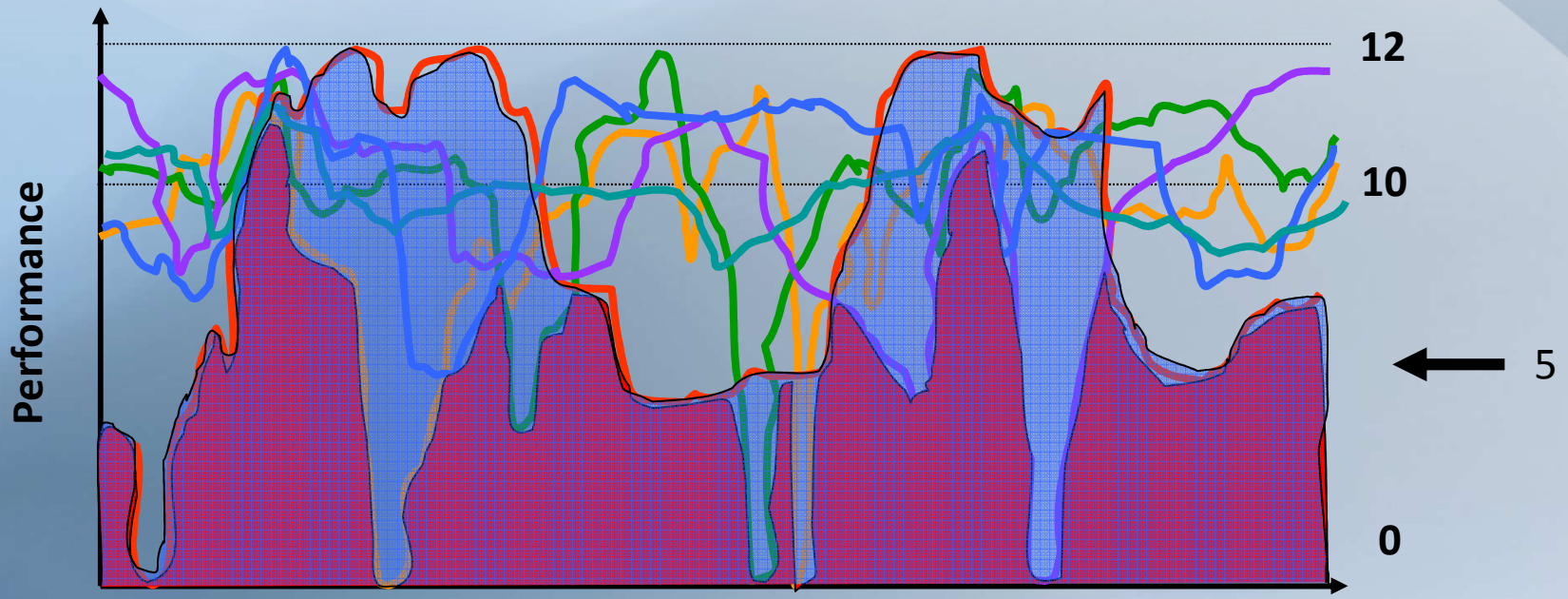
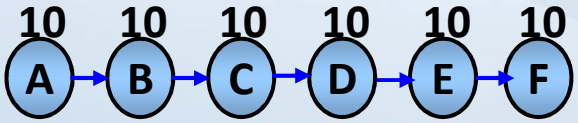
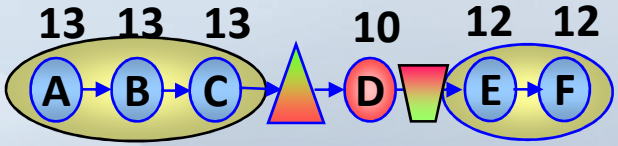

Performance
12
10
5
0
Time

Comparing 90% Available Balanced Capacity with 80% Available Optimised Flow Chains

Availability **90%**

$(0.90)^6$ = **58%** of design capacity

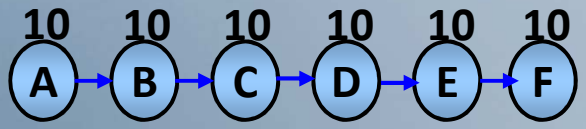


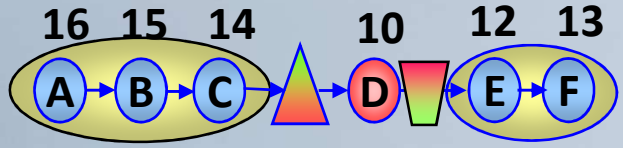


Costs	6 x 10 = **60**	(3x13)+10+(2x12) = **73**
Output	**5,8** Units	**9,0** Units
Cost/Unit	60/5,8 = **10,3**	73/9,0 = **8,1**

Availability **80%, but** Constraint **85%**

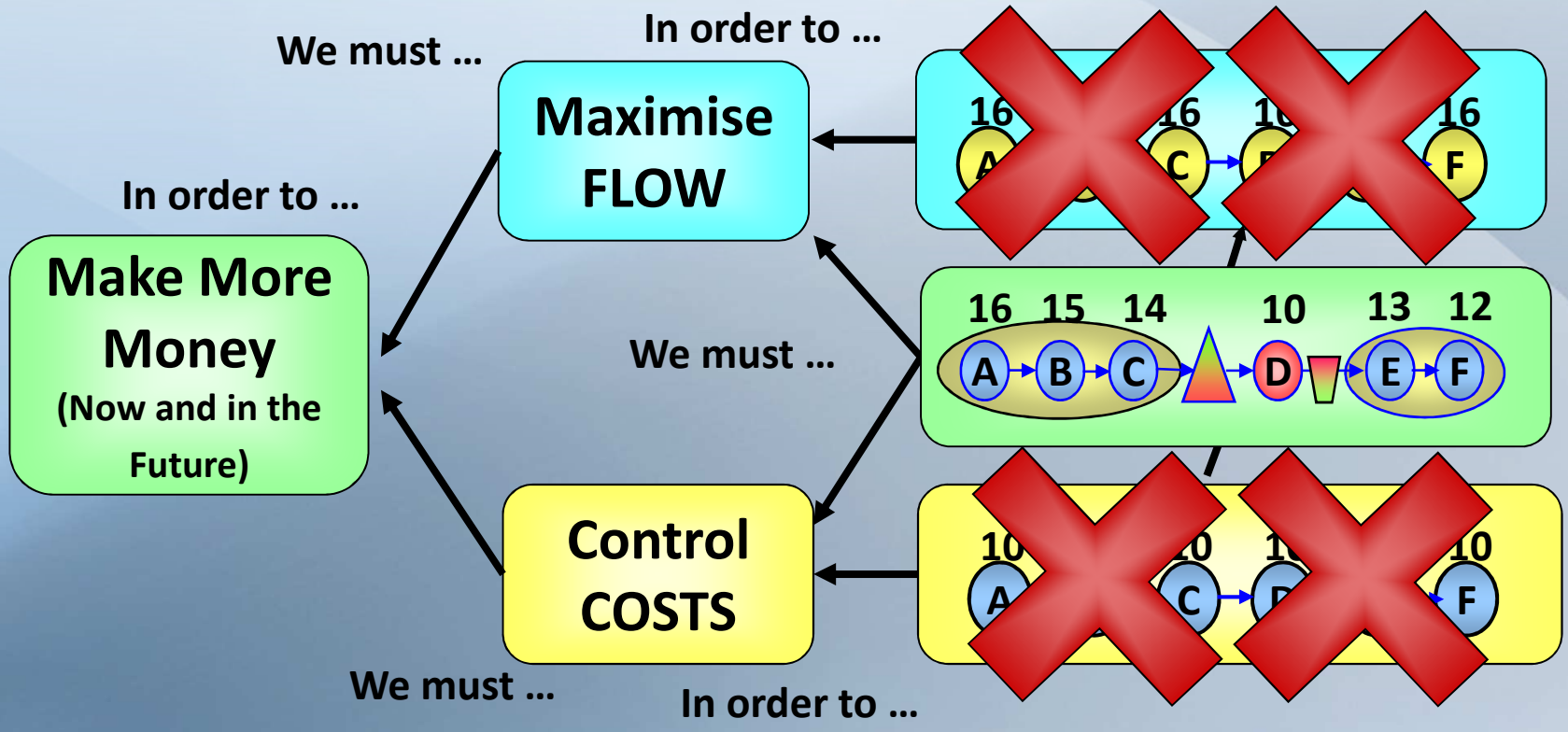
$(0.80)^6$ = **31%** of design capacity



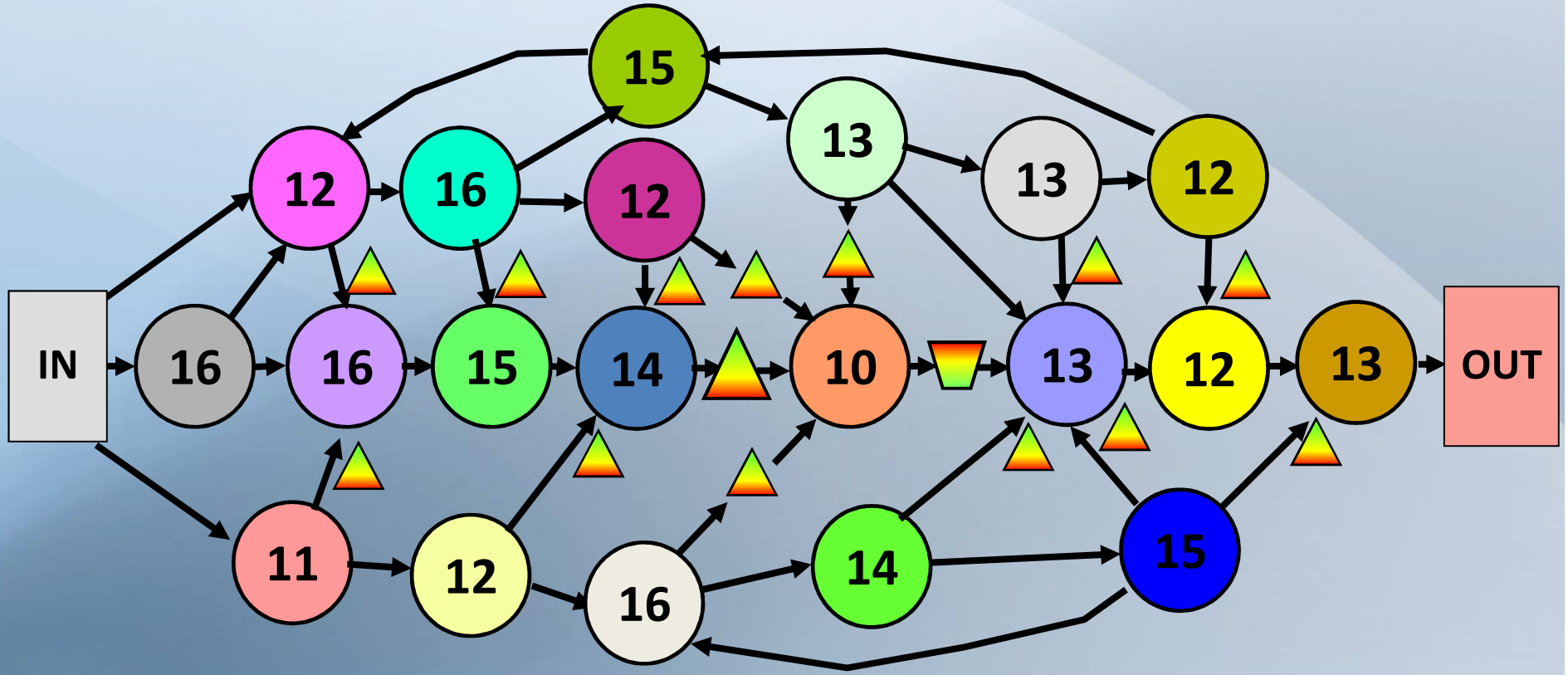


Costs	6 x 10 = **60**	(16+15+14)+10+(13+12)= **80**
Output	**3,1** Units	**8,5** Units
Cost/Unit	60/3,1 = **19,4**	80/8,5 = **9,4**

New Holistic Mechanism

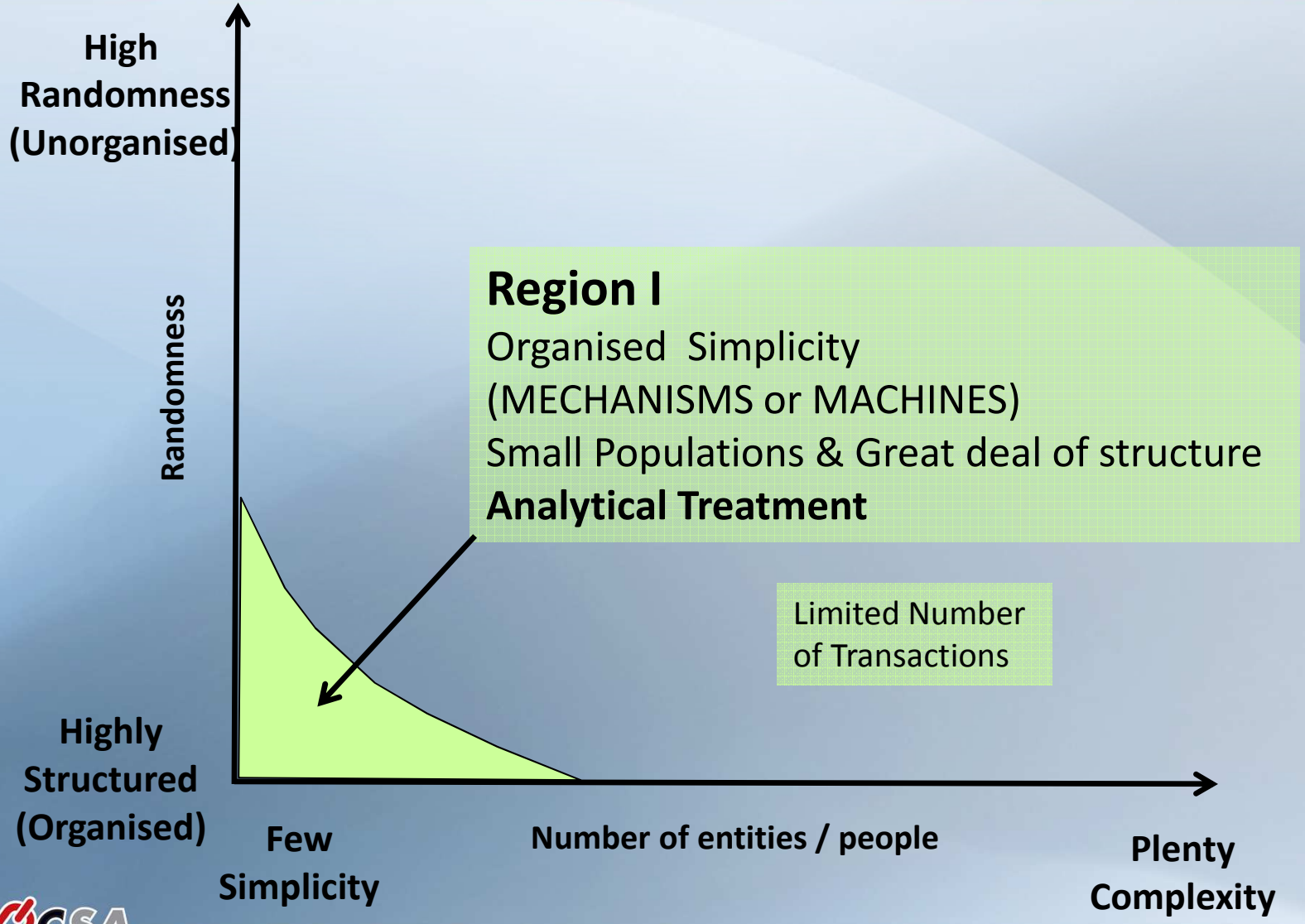


Optimised FLOW Corporation

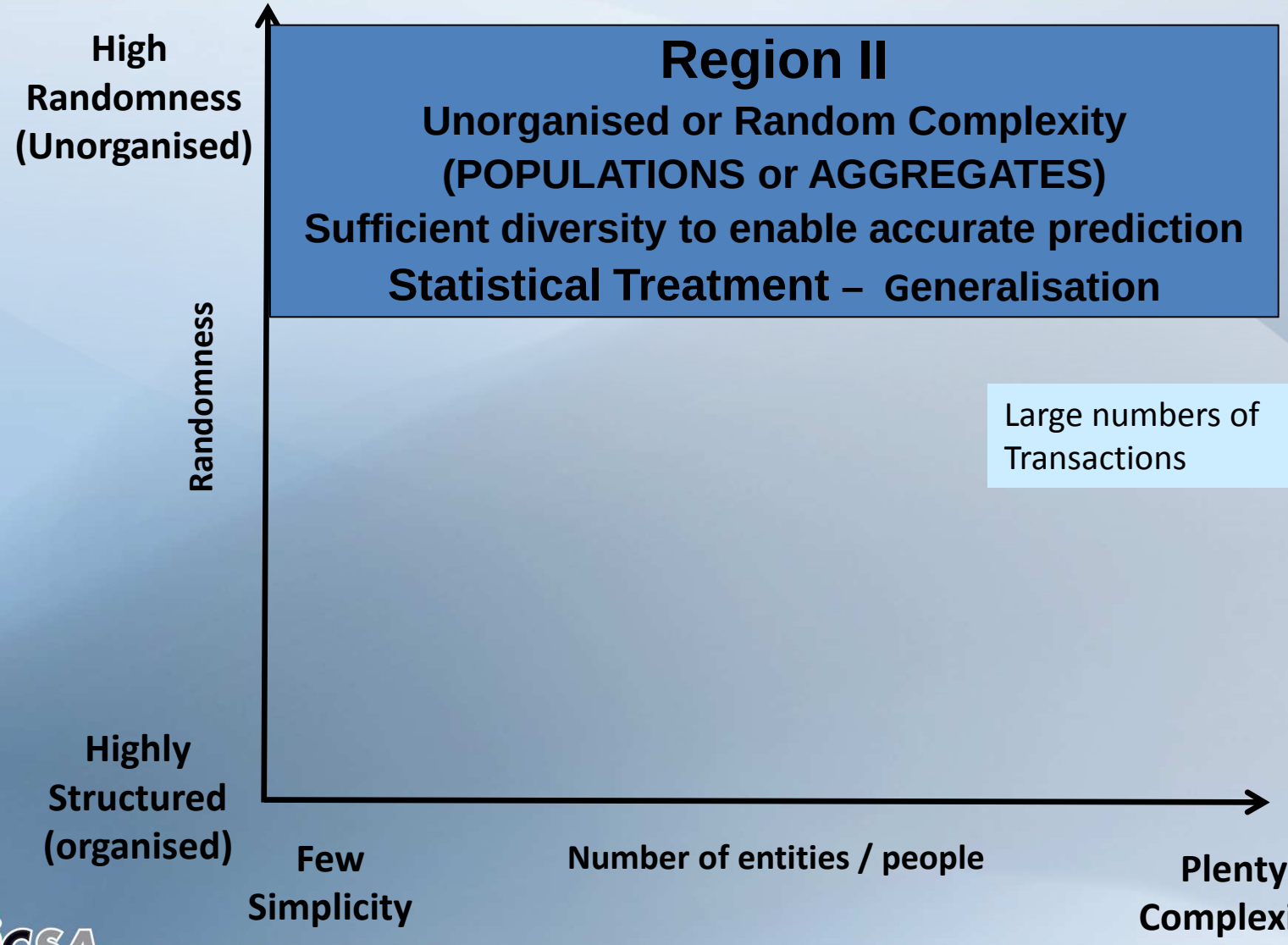


How People Typically Deal with Complexity?

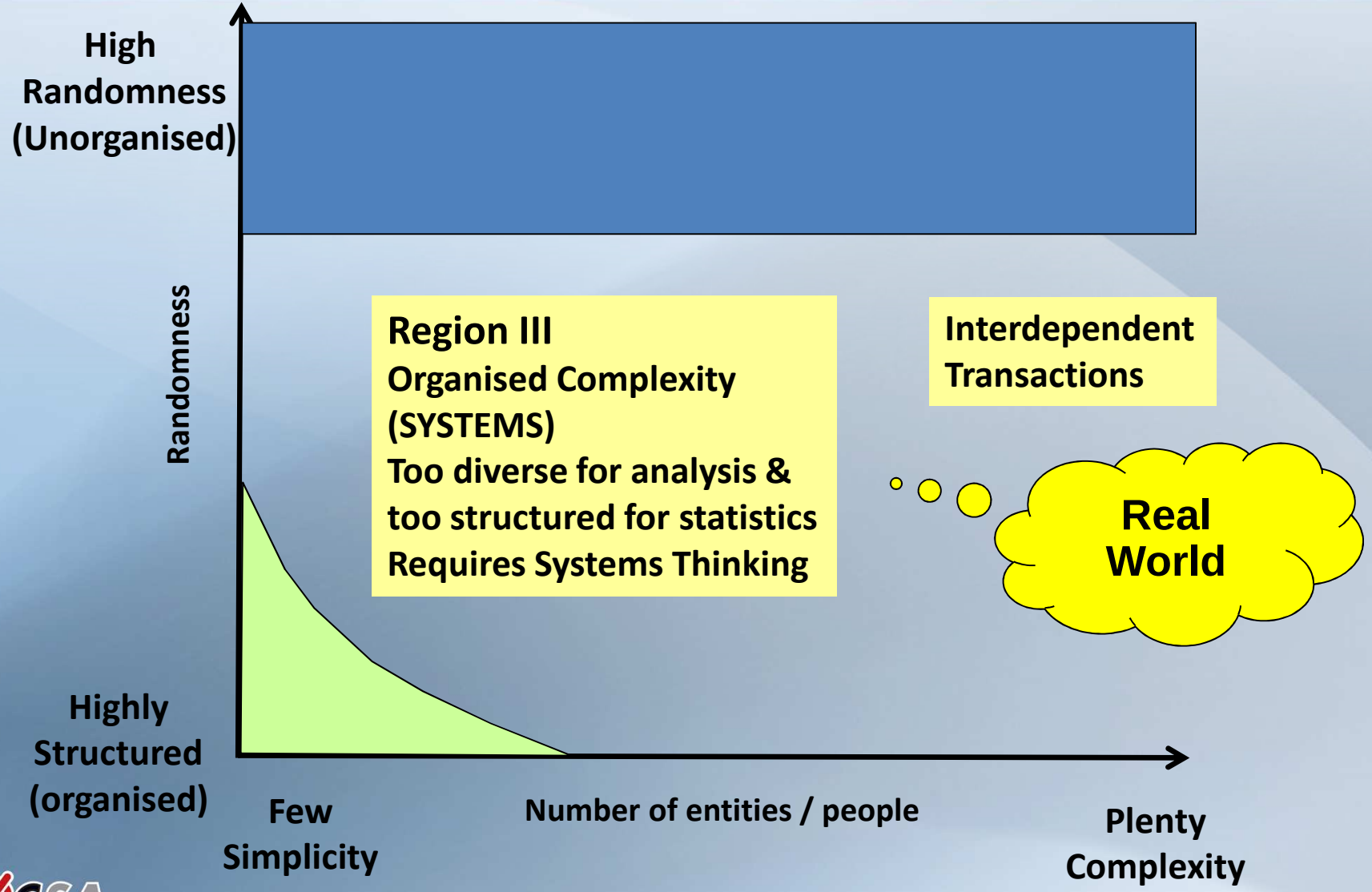
Systems Thinking: Law of Small Numbers



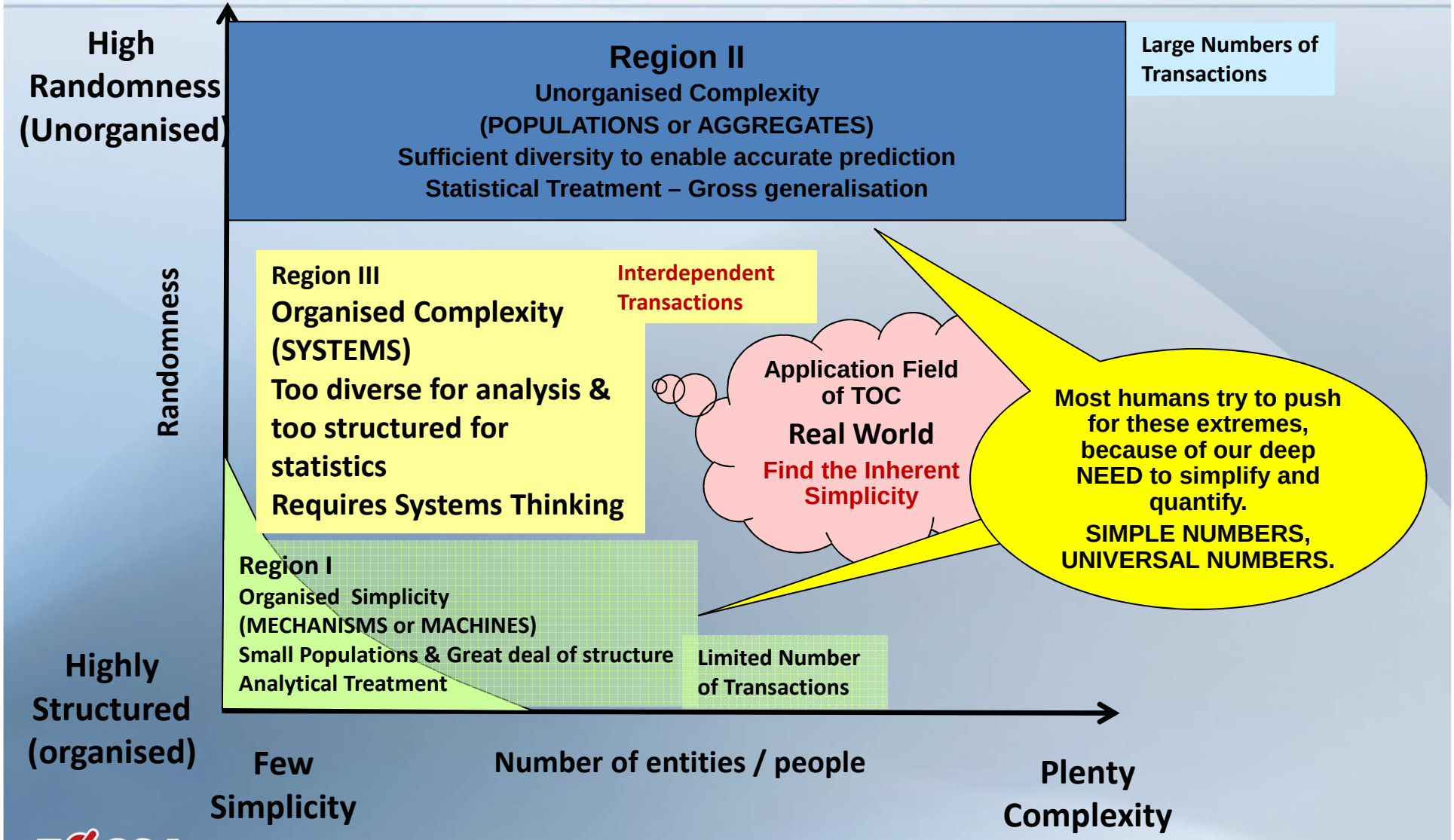
Systems Thinking: Law of Large Numbers



Systems Thinking: Law of Medium Numbers

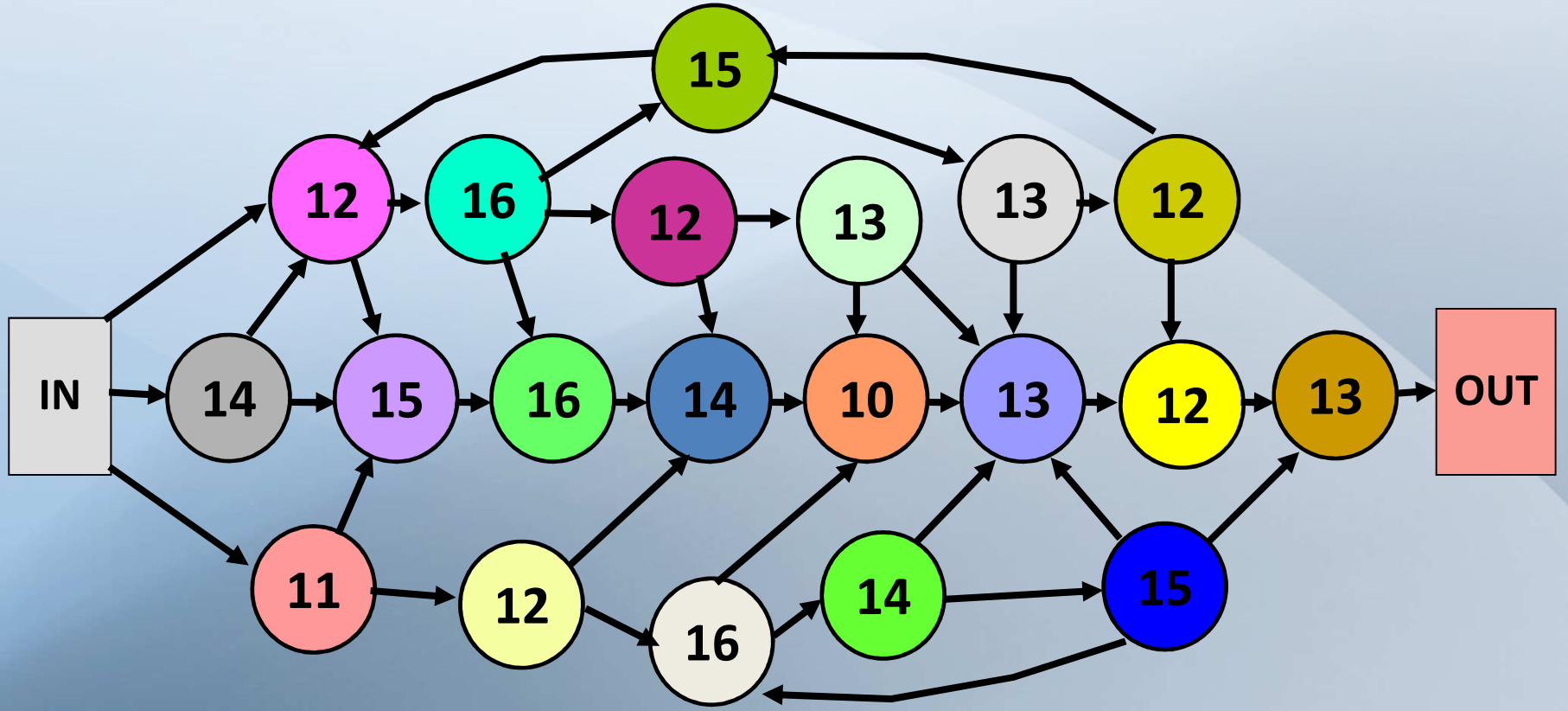


Application Field of TOC Thinking



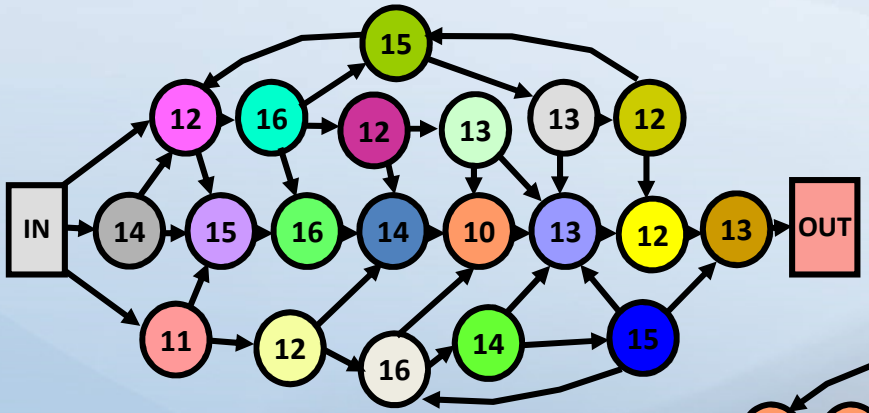
Corporations

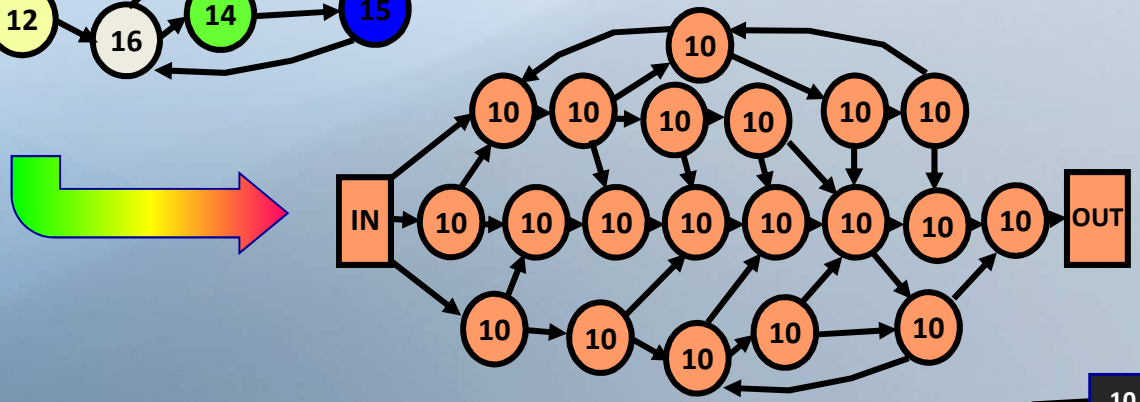
Building an Integrated System

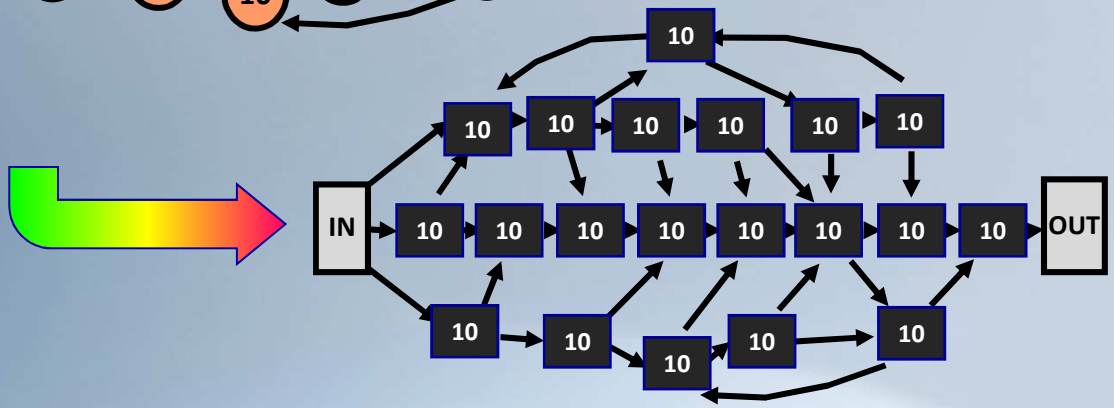


1. We dissect it into parts and ask the parts what their individual needs are
2. Then we (try to) program the linkages between them

Typical Corporate Optimisation Processes





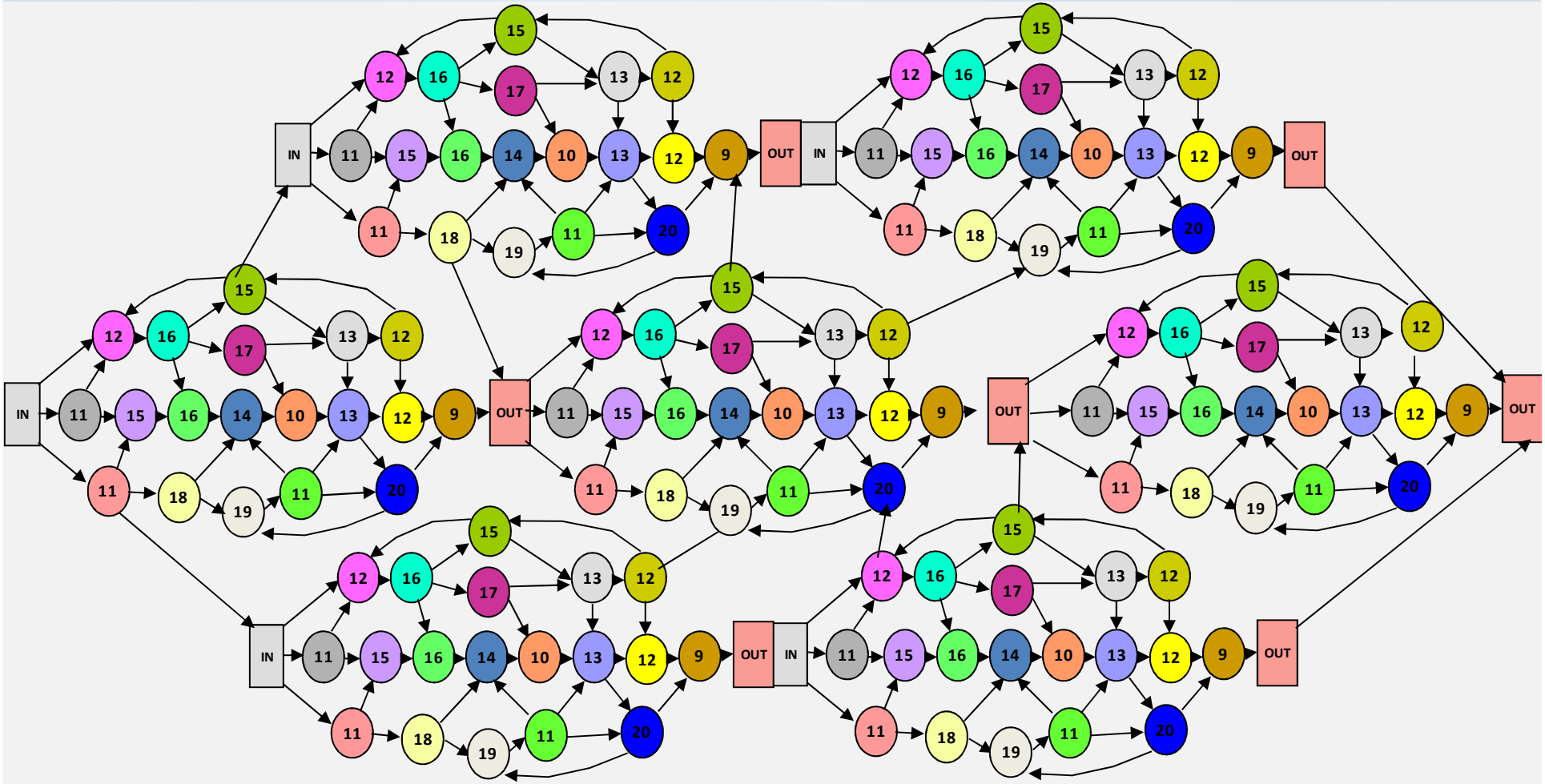


Black Box System

The big man is tied down with hundreds of little ropes and he is unable to move

We need to cut the ropes that tie the giant down - free it up!

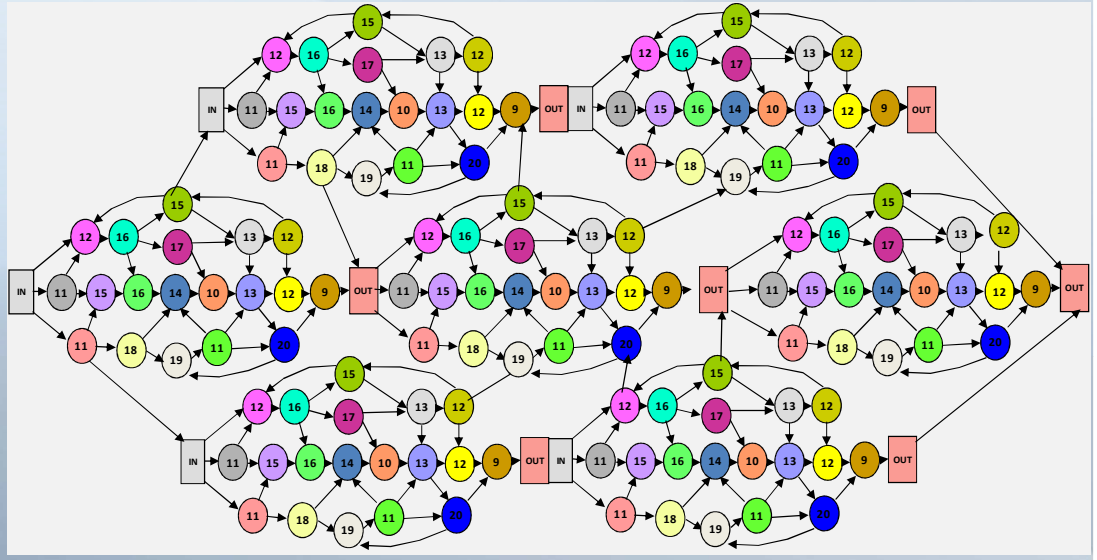
Trying to Make Sense of a Complex Corporate Environment?



Is there an alternative?

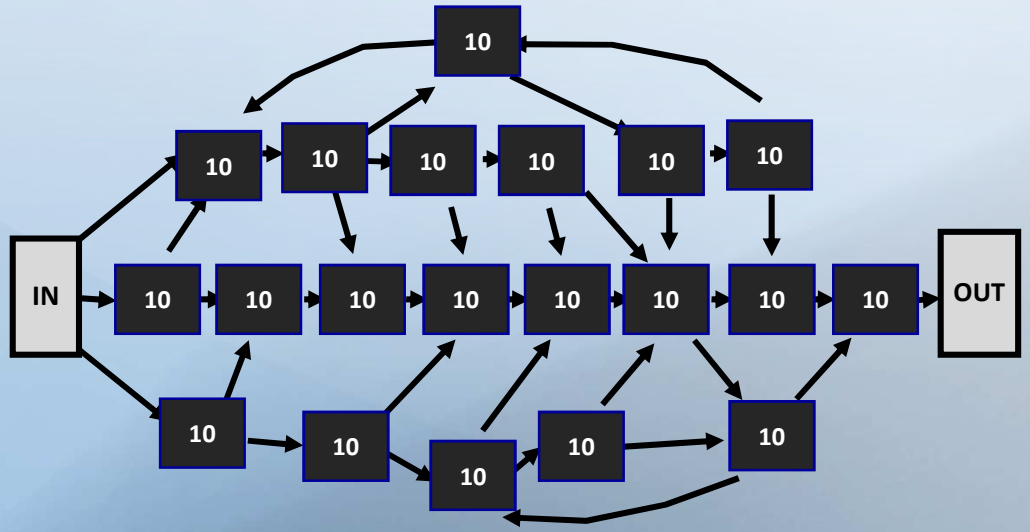
The way to be in control:

- Be in control of every link in the system
- Have a responsible person (expert) for every type of link
- Typical measures are efficiency, cost, OEE, etc
- It invariably leads to a world of Local Optima

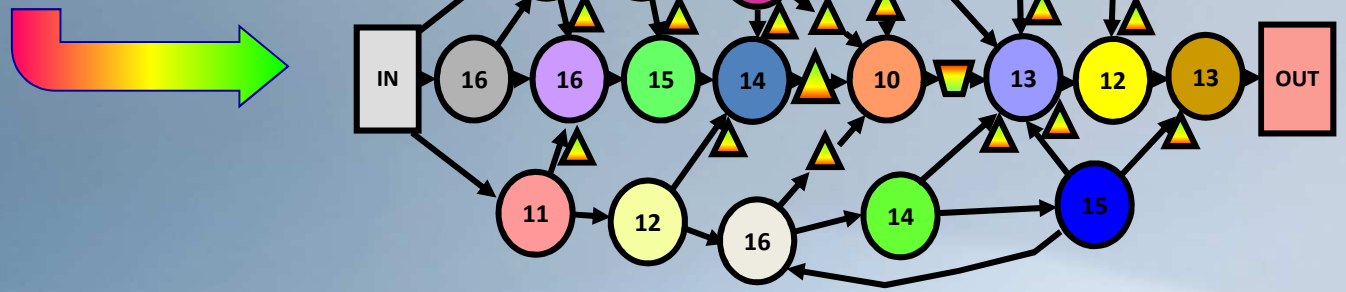


Very few Executives have the ability to SEE an ALTERNATIVE

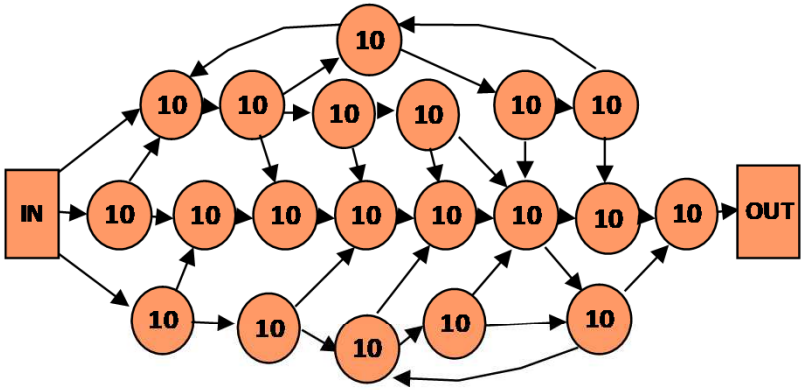
Reverting to TOC (Systems) Approach



A Significant Switch in the way we do Business!!!



The REAL Challenge



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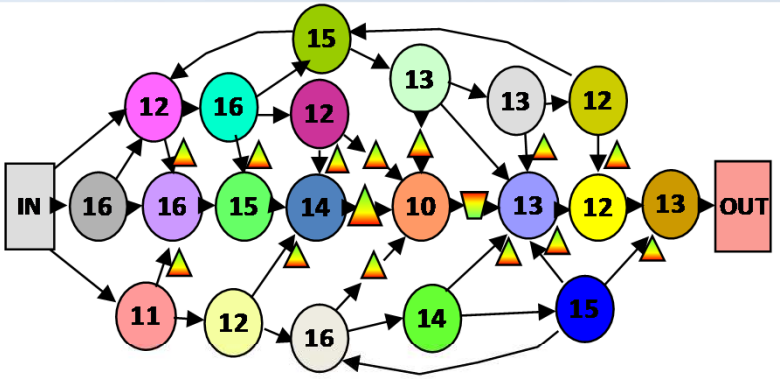


This is a BIG challenge

There is NO IN BETWEEN

Is it possible to Facilitate this kind of Change?

Yes it is, BUT the process is challenging!

New Insight

- It's never enough just to **tell** people about some new insight. Rather, you have to get them to **experience** it in a way that **evokes** its power and possibility.
- Instead of pouring knowledge into people's heads, you need to **help** them grind **a new set of eyeglasses** so they can see the world in a new way.

– John Seely Brown, Seeing Differently: Insights on Innovation

Putting TOC / FLOW into Practice

Reframing the mental models of

Local Optima (efficiency)

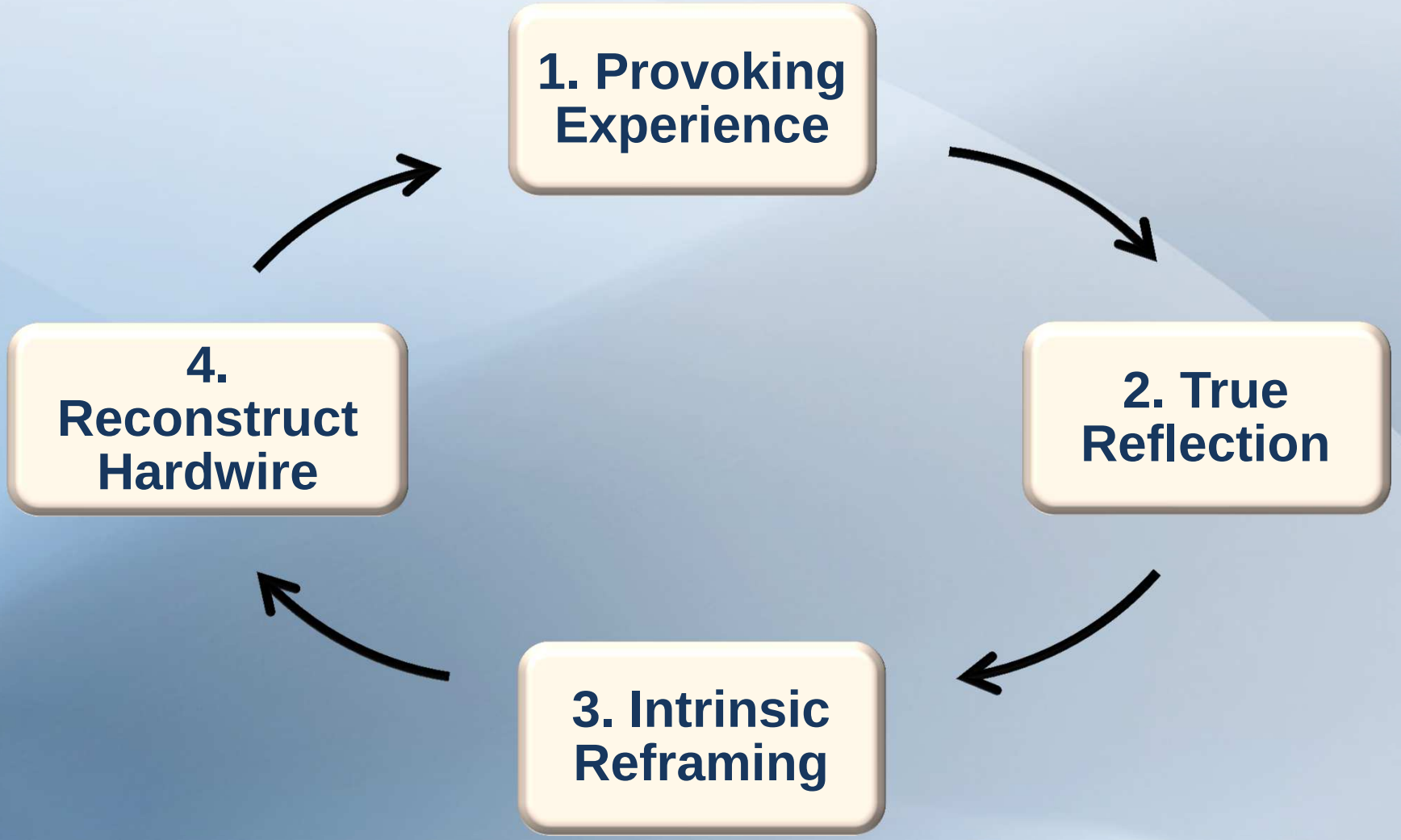
towards the mental models of

Optimised Flow

Dean Ornish on Changing BEHAVIOUR

- People who have experienced a real heart attack were placed before a crucial life decision: Change your life style or Die!
  - Lose weight, stop smoking, eat healthy and exercise regularly
  - After 3 years, 1/10 changed their life style; 90% did not!
- BUT, after a practical, positive experience of the following:
  - Losing weight, stopped smoking, eating healthy and exercising regularly
  - After 3 years, 77% changed their life style
  - This is done through an **experience** of the “Joy of Life”
- An experience of the **JOY OF LIFE** is much more powerful than the **THREAT OF DEATH**!

Direction for a New Solution



From Callie Roos & Associates

Direction of Solution

1. Give people an Experience of a different alternative in such a way, that it challenges their existing mental models deeply
2. Allow / Facilitate True Reflection on the Cognitive Dissonance
3. Facilitate Intrinsic Reframing of the old mental model to the new, preferably within a 72 hour time frame
4. Hardwire the new frames through real life application until the old frames have been replaced

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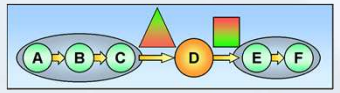
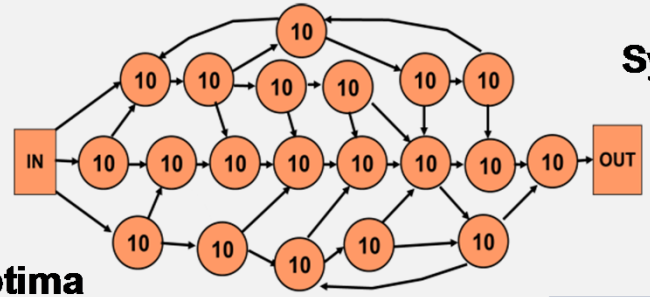
Strategic Intent with TOC Initiative

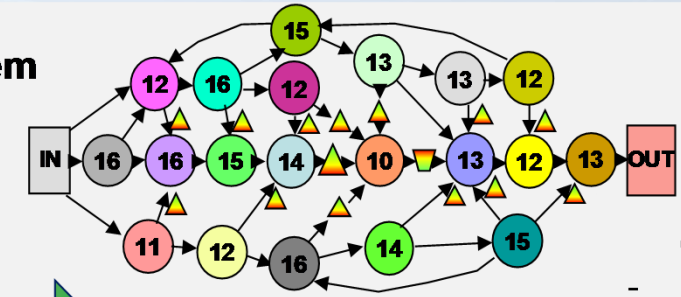




World of Local Optima

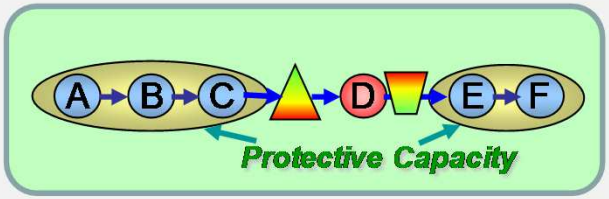
- Efficiency
- Statistics & Formulas
- Simple rules
- Physical

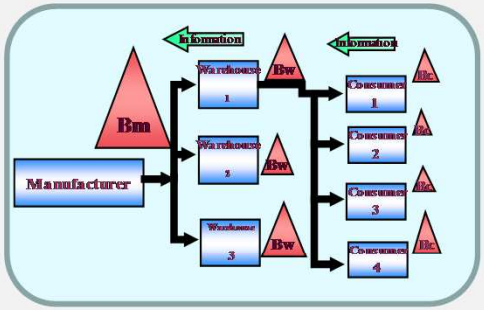
System

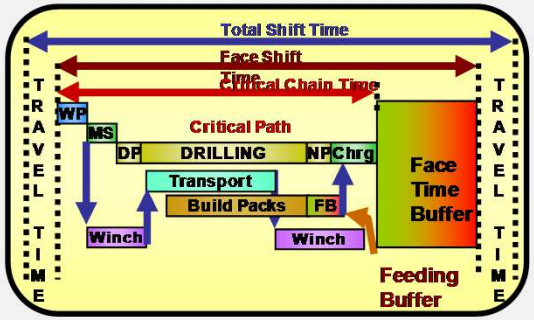


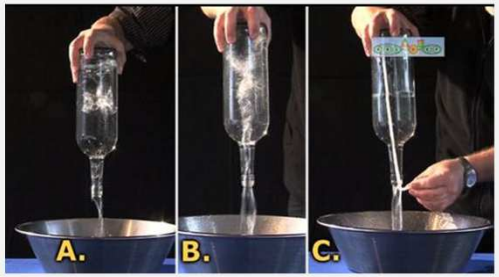
World of Optimised Flow

- Flow
- Bottlenecks & Buffers
- Interdependence
- Logistics & People









3 Bottles

War ROOM (Daily management system)

- Focus on Immediate Future
- Good Visibility
- Pro-active / Creative
- Behaviour / Culture