

# **Systems Thinking into 2018 - Yes, we still need it !**

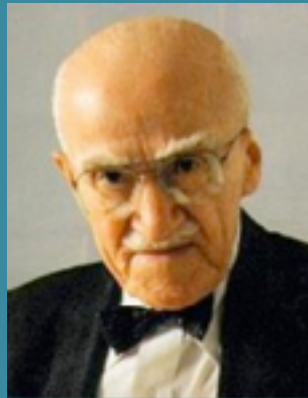
*ASQ Section 500 Presentation  
March 15, 2018*

# Systems Thinking

## Our Fathers of Theory



Deming



Juran



Scholtes



Tribus



Senge

# Why Bother with Systems Thinking ?

- According to Dr. Edwards Deming, 85% of all work problems are a result of the system management that is given for employees to work with. Deming before he passed claimed that Management's Responsibility was 96 %
- Joseph Juran - 85-15 Rule in Management
- Peter Scholtes estimates that 90 % of all organizational problems lie in the system
- Very few problems are the result of a single cause and effect relationship
- Very few problems can be solved with a single solution

# What is a System ?

## Defined by Webster's Dictionary

- **a group of interacting bodies under the influence of related forces**

Webster's Dictionary, 2018

# What is a System ?

- A system is a perceived whole whose elements “hang together” because they continually affect each other over time and operate toward a common purpose.

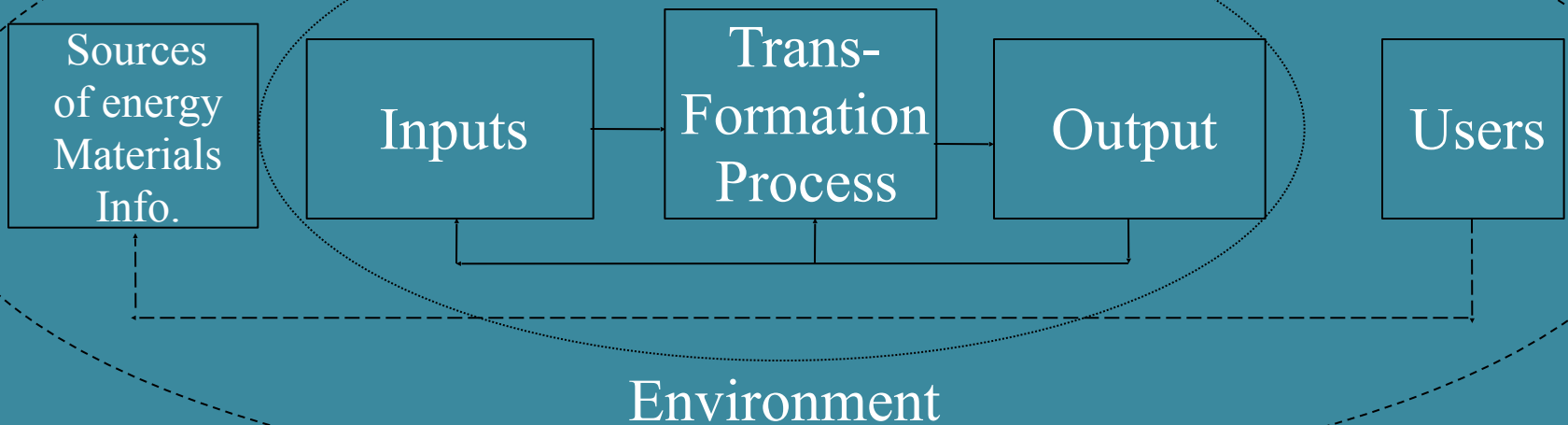
**Senge, Peter,; The Fifth Discipline FieldBook,  
(Doubleday: NY, NY, 1994) pg 90.**

# What is a System ? - Wharton Model

- A system is a logical configuration of the essential elements harmoniously working or not to achieve a well-defined set of objectives or to solve a specific problem within a given period of time.

**Ackoff, Russell ; A Managers Guide to Operations Research, 1963.**

# Open Systems (99 Percent of Systems)



Law of Entropy = All systems “run down”

# Systems Thinking

## Systems Thinking Principle:

- Blaming others doesn't solve the problem. Sometimes we need to stop to ask how we are contributing to the problem, too. This will aid in our own emotional development.

(Many Methods to help - 360 Reach; Standout 2.0 ; E.I. 2.0; Strength Finders 2.0)



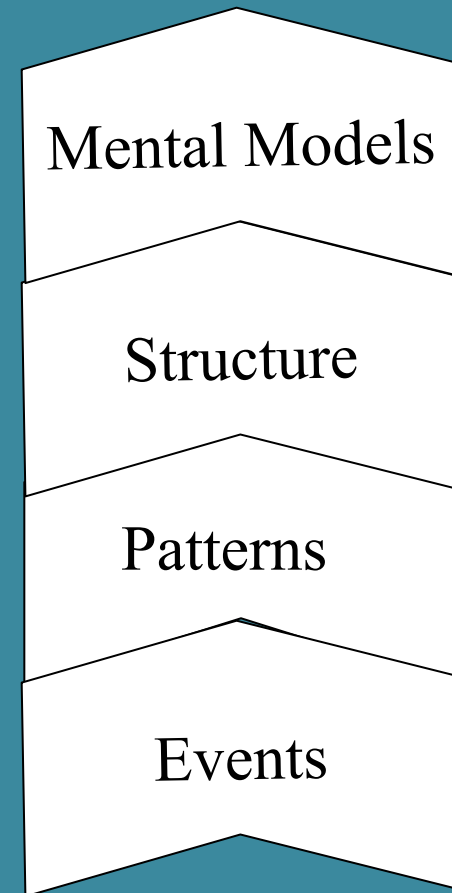
Zulauf, Carol. *The Big Picture: A Systems Thinking Story for Managers*, Lexington, MA; Linkage, 2001



# Systems Thinking

## Systems Thinking Principle:

- Events happen all the time. And they'll continue to happen! Our challenge is to look past the “event” stage and ask other kinds of questions.
- How many times has this happened? Is there a pattern? (**Histogram**)
- What may be causing this pattern to occur?
- How is this event affecting other areas/depts.? (**Ballon Effect**)
- Are our mental models accurate?



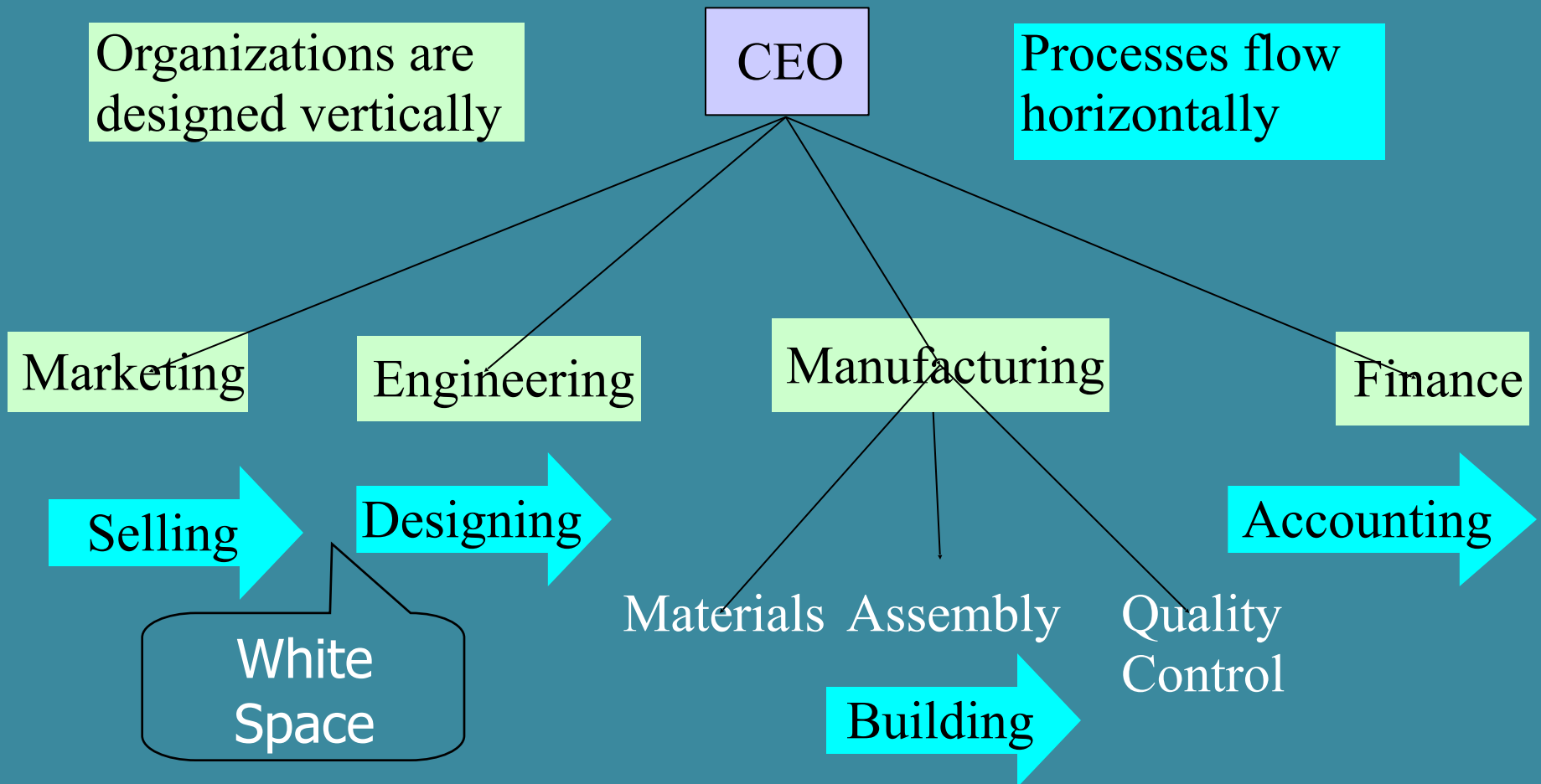
# Characteristics of Systems Thinking

- Understand complex relationships and interdependencies
- Balance the short-term and long-term needs and perspectives
- Reframe the issue or problem (Affinity/Tree)
- See the entirety of a situation (Flow Chart/Spaghetti)
- Discern patterns of recurring problems
- Question any and all underlying assumptions
- Develop understanding and compassion

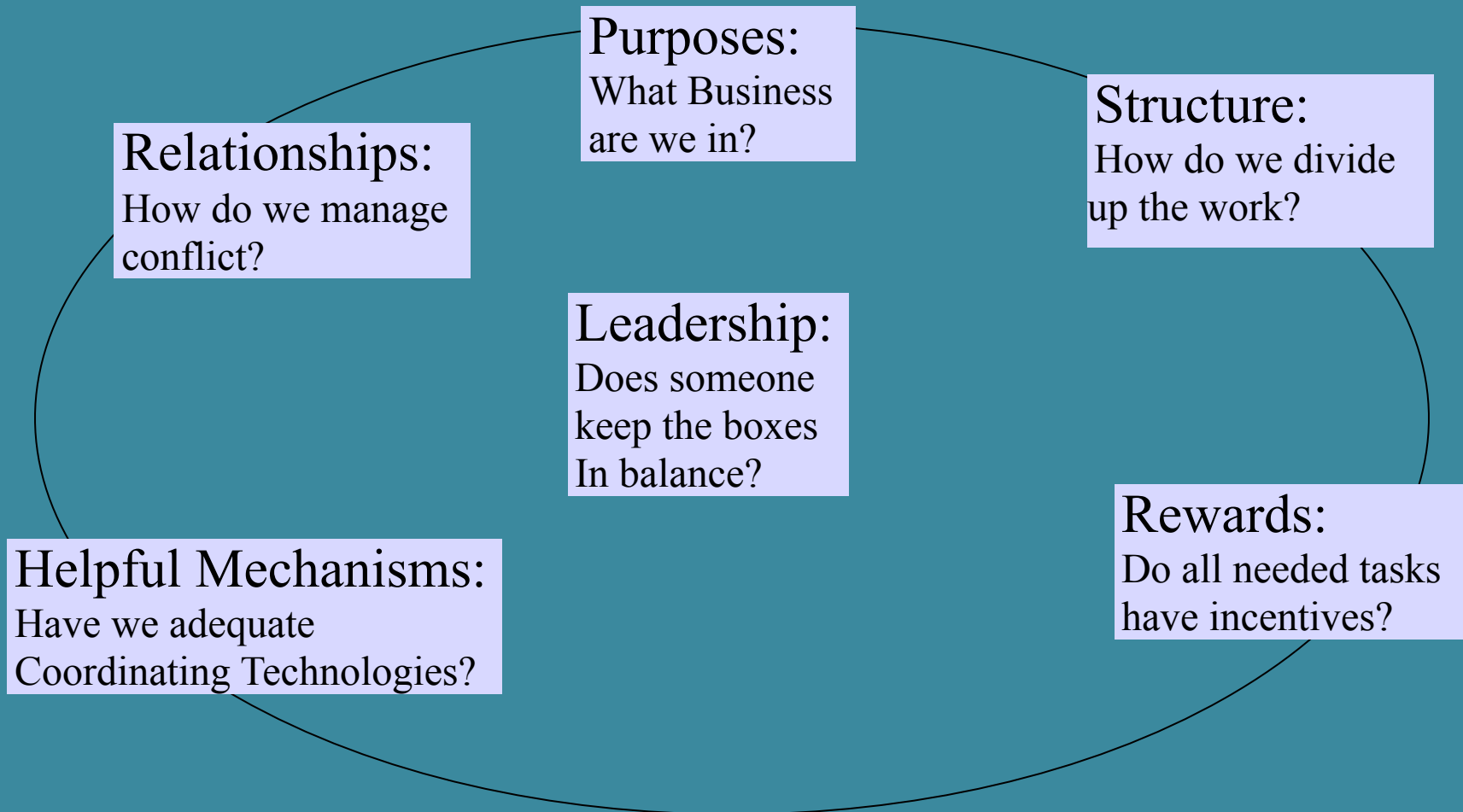
**Carol Zuluaf, Systems Thinking,  
ASTD Info Line Issue #9703, 1998.**

# Process Management

## One basic problem



# The Six-Box Organizational Model



# Managing an Organization as a System

- Establish a business strategy
- Assess the current state
- Document the measurement system
- Identify core processes and develop a performance improvement plan
- Develop a performance measurement and management system
- Modify the structure if necessary

**Brache & Rummler, Managing an Org. as a System  
Training, Feb. 1997, p68-74.**

# Classic Problem Definition :

A Problem Well  
Defined is a Problem  
Half Solved

Lumsdaine & Lumsdaine

# *A Key Managerial Phrase :*

- What are we giving you that you don't need ?
- What do you need that we are not giving to you ?

**Peter Scholtes**

# Understanding your Process :

- If you don't know how it works now, how are you going to know when it doesn't work ? This is why we document the process and use flow charting !

**Myron Tribus**



# How to Improve a System :

- In God We Trust, All others bring Data
- Don't Shoot the Messenger
- Fix the Problem, NOT the Blame

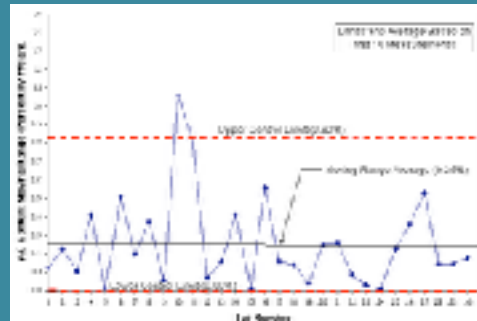
**Dr. Patrick P. Donnelly,  
Drexel University**

# Statistical Control of your System :

- All systems show either that they are In Control -or - Out of Control.
- How we can tell this ? Through a Control Chart
- Does the data fall between the control limits ? Y or N
- Control Limits are : Average  $\pm$  (3 times the Square Root of the Average)
- Example : my average is 36, so  $36 \pm 3$  times the (Square Root of 36) represents the values of UCL of 54 & LCL of 18. Any value above 54 or below 18, we have an assignable cause, any value in this range, can only be improved thru a system change, i.e. Management.

# Statistical Control Example :

- Data in your system : 8, 11, 16, 19, 24, 26, 31, 9, 15, 34, 25
- Control Limits are : Average  $\pm$  (3 times the Square Root of the Average) -OR- 19.82  $\pm$  13.35 which is an Average of 19.82 with an LCL of 6.57 and an UCL of 33.17.
- We have an assignable cause of 34 in our number set, This could be one problem - just a human error, dull tool, end of a raw material batch, etc. We should be able to fix this. All the other values are In Control, any value in this range, can only be improved thru a system change, i.e. Management.



# Understanding your System :

- There are actually eight (8) Control Chart tests that show whether a process is In Control -or- Out of Control.
- The actual Rules and examples of solutions to these types of system problems are found in <https://www.spcforexcel.com/knowledge/control-chart-basics/control-chart-rules-interpretation#control-chart-rules>

# Understanding your System :

- Example would be if 7 data points trended consecutively up or down on the control chart
- This would mean that the system has encountered a TREND and more than likely the CAUSE is from either TOOLING WEAR -or- TEMPERATURE EFFECTS (such as cooling or heating in the process) which one sees has nothing to do with operator or operator training, but the SYSTEM alone.



# Ask WHY Five (5) Times ?

- We have oil on the warehouse floor - Causing Safety and Workman Comp Issues - **Why ?**
- Fork Truck leaks oil - **Why ?**
- Bad Gasket on the Fork Truck - **Why ?**
- Purchased Cheapest Brand of Gasket - **Why ?**
- Purchasing Performance done on price alone - **Why ?**

**Purchasing Agent Policy based on saving the company most money based on PRICE, not total COSTS. - Change Policy.**

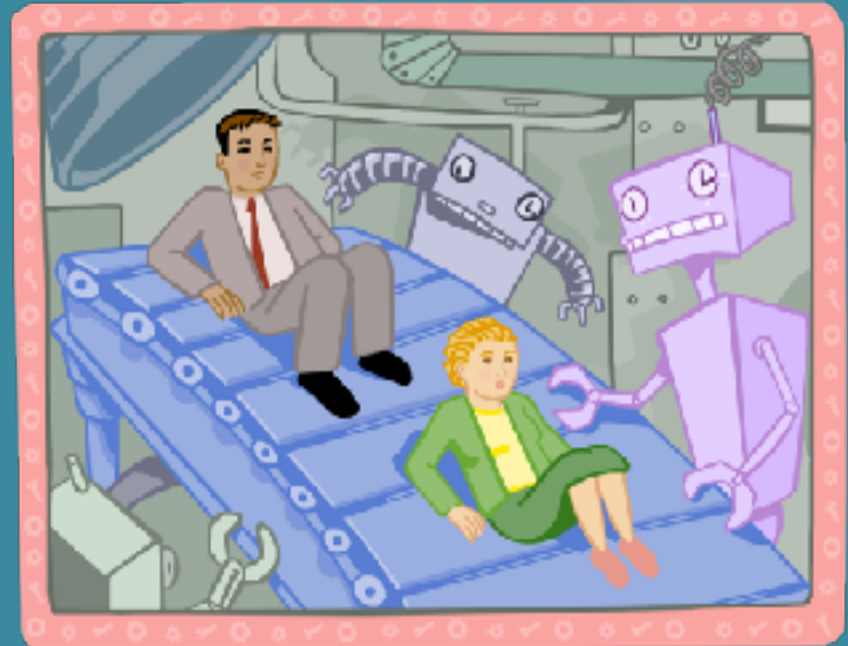
# Systems Thinking Tools

- Operational Definitions - Ergonomic Checks
- Team Work - Leadership
- Soft Tools - Multi-Voting, Brainstorming, Affinity
- 7 Simple Quality Tools & the DMAIC Process
- D.O.E.- ANOVA/Taguchi Methods
- Process Documentation - GMP & ISO Guidelines
- Auditing and Verification
- Worker and Supplier Certification
- Data-Data-Data - Metrics (Balance Score-Card)



# Systems Thinking

- Look beyond the obvious
- Don't let the system run your people. Help your people control the system.



# How is Systems Thinking used in your Job, Church, Sports, Company ????????

Are we part of the  
**PROBLEM -OR-  
part of the  
SOLUTION ?**

