

Systems Thinking

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Systems Thinking - Questions

Why is the whole less than the sum of its parts?

Why can't the whole be MORE than the sum of its parts?

Systems Failures

- **SUV Tire Blowouts**
- **Enron**
- **BP Texas City Explosion**
- **BP Gulf Oil Spill**
- **U.S. Mortgage Crisis**
- **Challenger Explosion**
- **Columbia Destruction**

Roots

- **Dr. W. Edwards Deming**
- **Dr. Russ Ackoff**
- **Quality, productivity and performance are a holistic enterprise**
- **Management of interactions between components, not just the components themselves**
- ***“Cylinders of Excellence”?***

How to Destroy a System

- **Separately improve one or more parts**
- **Conflicting organization goals**
 - *Red Eye flights in order to save travel costs*
 - *Further examples in The New Economics and Out of the Crisis*
- **One group's attempts to improve may adversely affect other groups**

A Six Sigma Story from Rip Stauffer

- **Two business units told stories of their Six Sigma improvements during a class**
- **Each unit was its own profit center, and claimed six-figure savings for their own center**
- **Each unit set up their own processes to avoid buying services from the other, costing \$30,000 for the 1st group, \$25,000 for the 2nd group**
- ***What was the result for the corporation?***
 - *Million Dollar Savings? Or \$55,000 Loss?*

The Orchestra

- **Deming compared organizations to an orchestra**
- **An orchestra is more than a collection of soloists, each competing for the audience's ear**
- **Orchestra members cooperate and interact with each other to produce a concert**
- **Compare this to a bowling “team”**
- **Consider the “Win All You Can” experience**

Life Cycle, Long Term Vision

- **Consider total life cycle costs, not just purchase price**
- **The “lowest bidder” may have the highest total cost**
- **Systems Thinking implies a long term vision, rather than focusing on this quarter’s results**

“Parts is Parts”

- **A system is made up of a set of parts**
- **Each part can affect the system**
- **Each part has an affect on other parts**
- **Every possible subgroup of parts can affect the system**
- **HOWEVER – no individual part can have an independent effect on the whole**
(Ackoff)

Dissection Destroys the System

- **You write, your hand does not write**
- **A system must have an aim**
- **The aim allows people within the system to know what they are working towards**
- **Cooperation should be developed and encouraged**
- **Many existing systems destroy cooperation through a focus on competition between departments, between people**

The High, Unknown, and Unknowable Costs

- **Numerical targets can lead to**
 - Distortion
 - Shifting costs to others
 - Falsification of results
- **Crisis (mis)Management**
 - Firefighting is rewarded rather than prevention
 - “Hair on Fire”
- **Fear prevents teamwork, and cripples a system**

Building a Better Future

Which is better –

To predict the future and determine how to best live within it,

Or

To build a better future?

Thoughts

- **Dr. Deming stated “The job of management is prediction”**
- **Control charts allow us to determine if we can make predictions of future performance**
- **We have discussed the potential role of “Leading Indicators” – prediction versus building**
- **Be careful to not limit yourself solely to prediction and incremental improvements – know when to start afresh, with a new design.**

Implications

- **If we all work within systems, that implies that we cannot independently affect the system**
- **We can affect other components of the system**
- **If we want to change the system, we need to team with other people in the system**
- **This has implications for performance appraisals, goals, and how we approach our daily work**

Implications (2)

- **An individual's work output is $X + f(X)$, direct output plus the interaction of the individual and the system**
- **Dr. Deming noted that the overall outcome is the sum of the individual contributions, plus the interactions between individuals, some of which may be negative interactions, subtracting from the whole.**

Discussion

Can you think of some examples of best efforts from an individual component (person or organization), intended to improve system performance, instead caused an overall negative impact on the system?

Can an individual component work at a “loss” resulting in a net gain for the whole system?

What common practices can lead to competition and destruction of the system?