
Complex Adaptive Systems and Quality Management: Are They Compatible?

ASQ Section 1508

December 10, 2012

Basic Question

- **Increased interconnections and competition has caused us to use new metaphors to describe organizations**

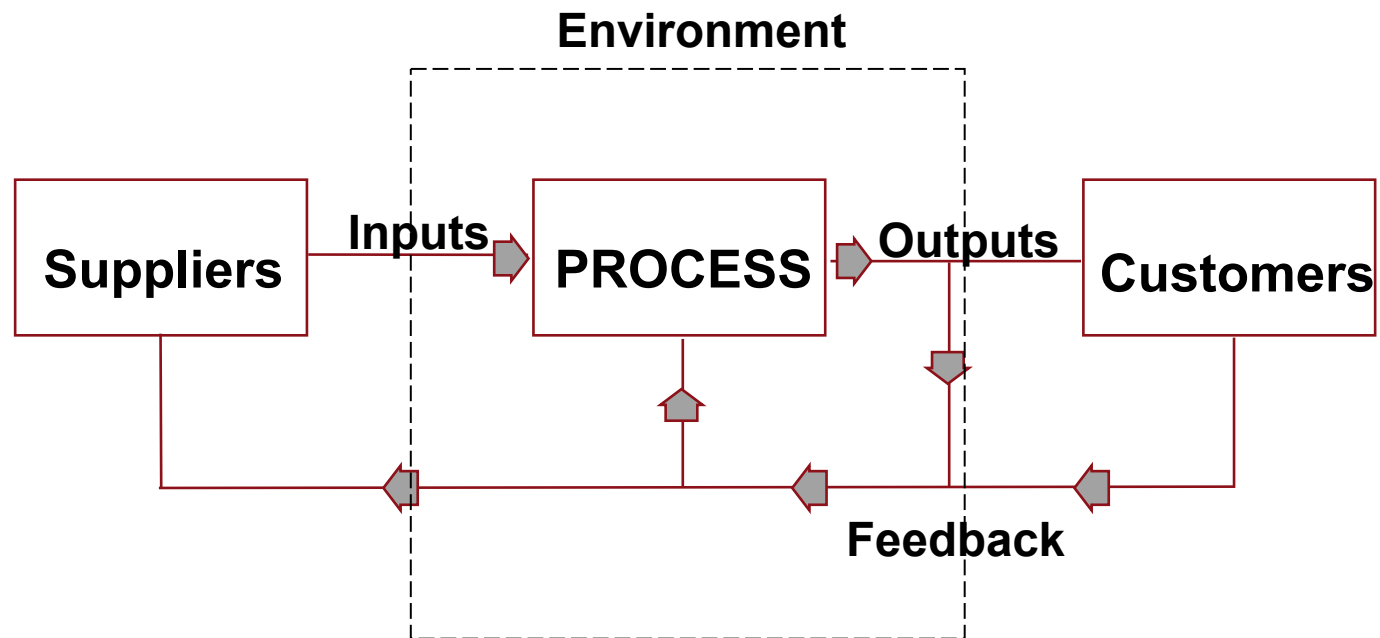
Mechanical  *Organic*

- **Will QM still work in organizations that are complex adaptive social systems?**

Frame of Reference

- **Mechanical systems are linear, have unidirectional cause & effect relationships, and are predictable**
- **Complex adaptive systems are nonlinear, have reciprocal causality, and are unpredictable**

What is a System?



Changes in environment = society, technology, economics, etc.

Types of Systems

Number of Components

Low

High

Predictability

High

Simple

Complicated

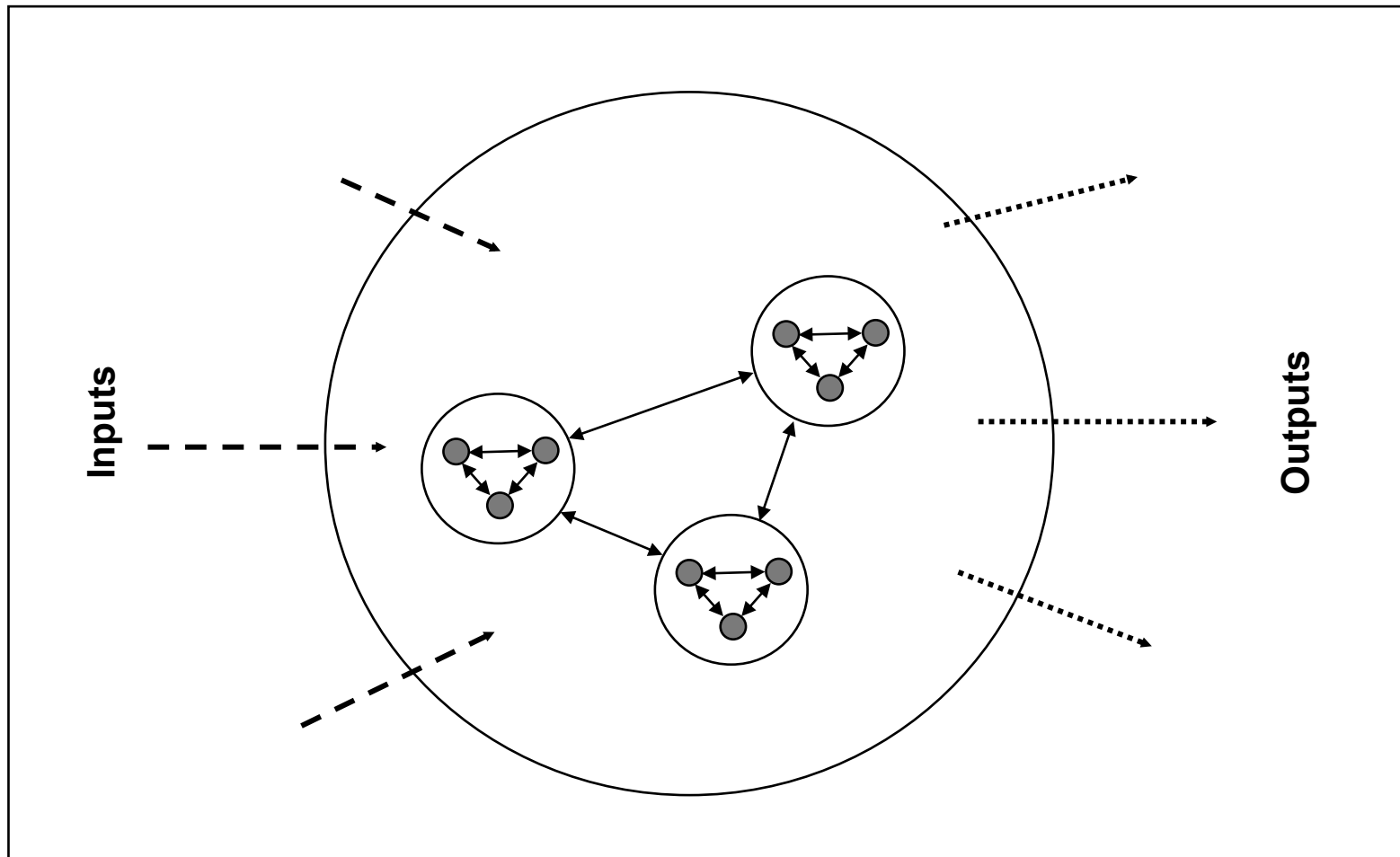
Low

Chaotic

Complex

	<i>High</i>	Simple	Complicated
Predictability			
	<i>Low</i>	Chaotic	Complex

Organizations as Complex Adaptive Social Systems



Role of Management

Mechanical View:

Set strategy, specify organizational design and provide resources, monitor results

Complex System View:

Clarify boundaries, ensure resource availability, ensure alignment of subsystems

Hoshin planning and self-directed teams more appropriate for a complex system

Quality Management

- **Baldrige focus on values/principles (boundaries), customer (environment)**
- **2000+ editions of ISO 9000 with reduced focus on documentation and increased focus on customer interface**
- **Process control methods should consider whether or not process is linear and predictable**

Examples

Linear & Predictable:

- **Filling an order at McDonalds**
- **Processing a bank deposit**
- **Most assembly lines**

Nonlinear and Unpredictable:

- **Creating an advertisement**
- **Delivering leadership training**
- **Selling a house**

Important Features of Complex Social Systems

- They are adaptive
- They self-organize
- Creative outcomes emerge
- They can deal with multiple landscapes

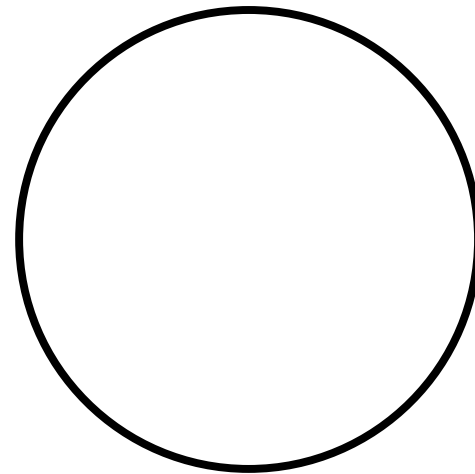
*People are neither machines nor animals ...
they have intent and choice,
and will exercise both.*

Matching Controls to Type of Process

Linear &
Predictable



Nonlinear &
Unpredictable

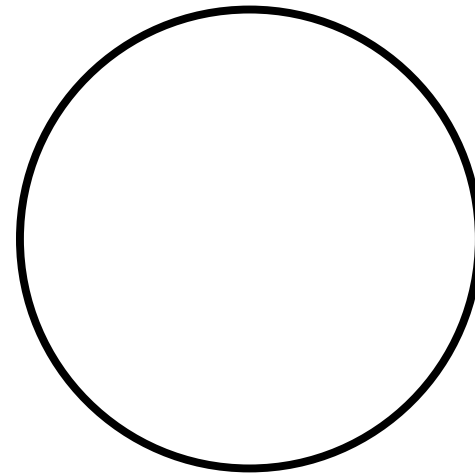


The Polarities & Difficulties

ISO in the 1990s



TQM in the 1980s

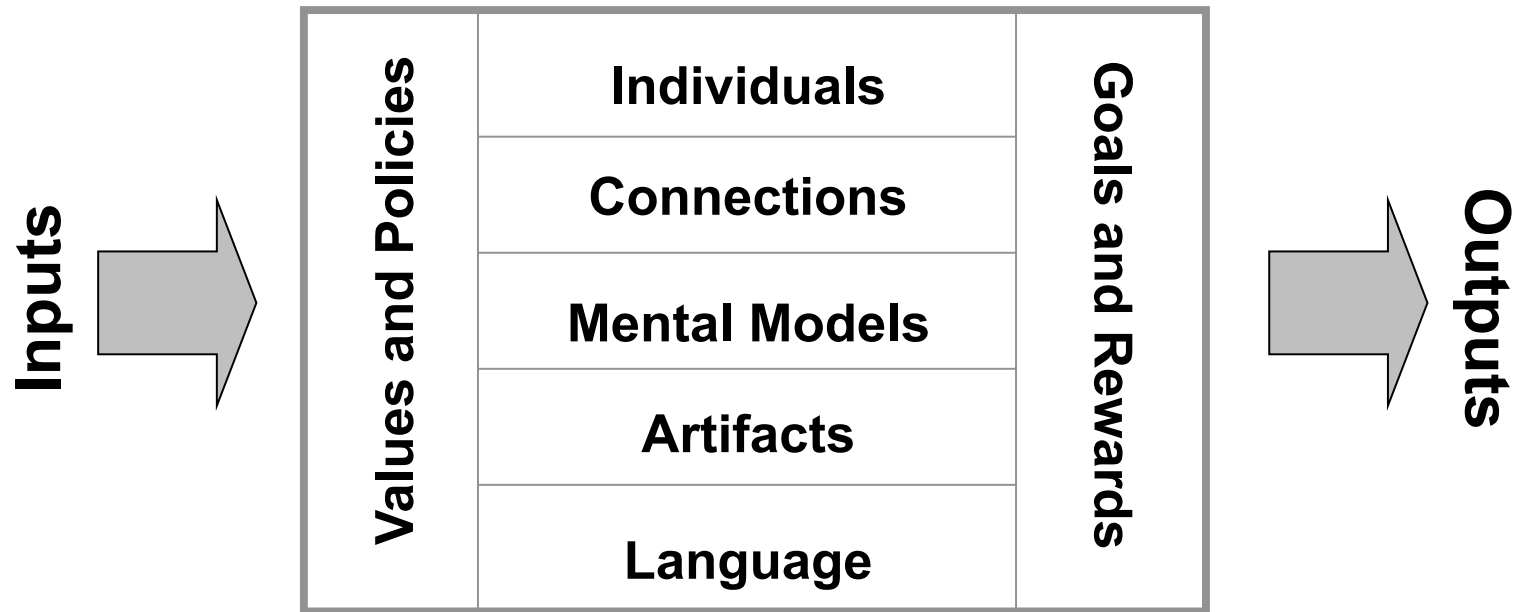


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"SEE — IT'S NOT IMPOSSIBLE
FOR AN OBSESSIVE-COMPULSIVE TO GET A RESPONSIBLE JOB."

Changing a CAS



How to Start a Forest Fire?

Changing an organization, when:

- **You have a strong wind at your back**
- vs.**
- **When you don't!**

The Job of Management

Per Dr. W. Edwards Deming:

Prediction

Per Duke Okes:

Adaptation

Contact Information

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