

# ***Introduction to Complexity***



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# Messes

*Messes are situations where you know there is a problem but you can't put your finger on the problem ...*

- Poor communication throughout the organization.
- Isolation of individual departments within organizations.
- Cultures that perpetuate processes rather than adapt to changing needs.
- Retirees and employees leaving who take critical knowledge with them.
- The changing nature of the economy and technology and the organizational changes needed to maintain effectiveness.
- Rapidly changing leadership preventing long-term consistent organizational improvement to meet an ever-changing customer base.
- Emphasis on efficiency, productivity, and working harder and longer instead of working smarter and more effectively.

# Complexity

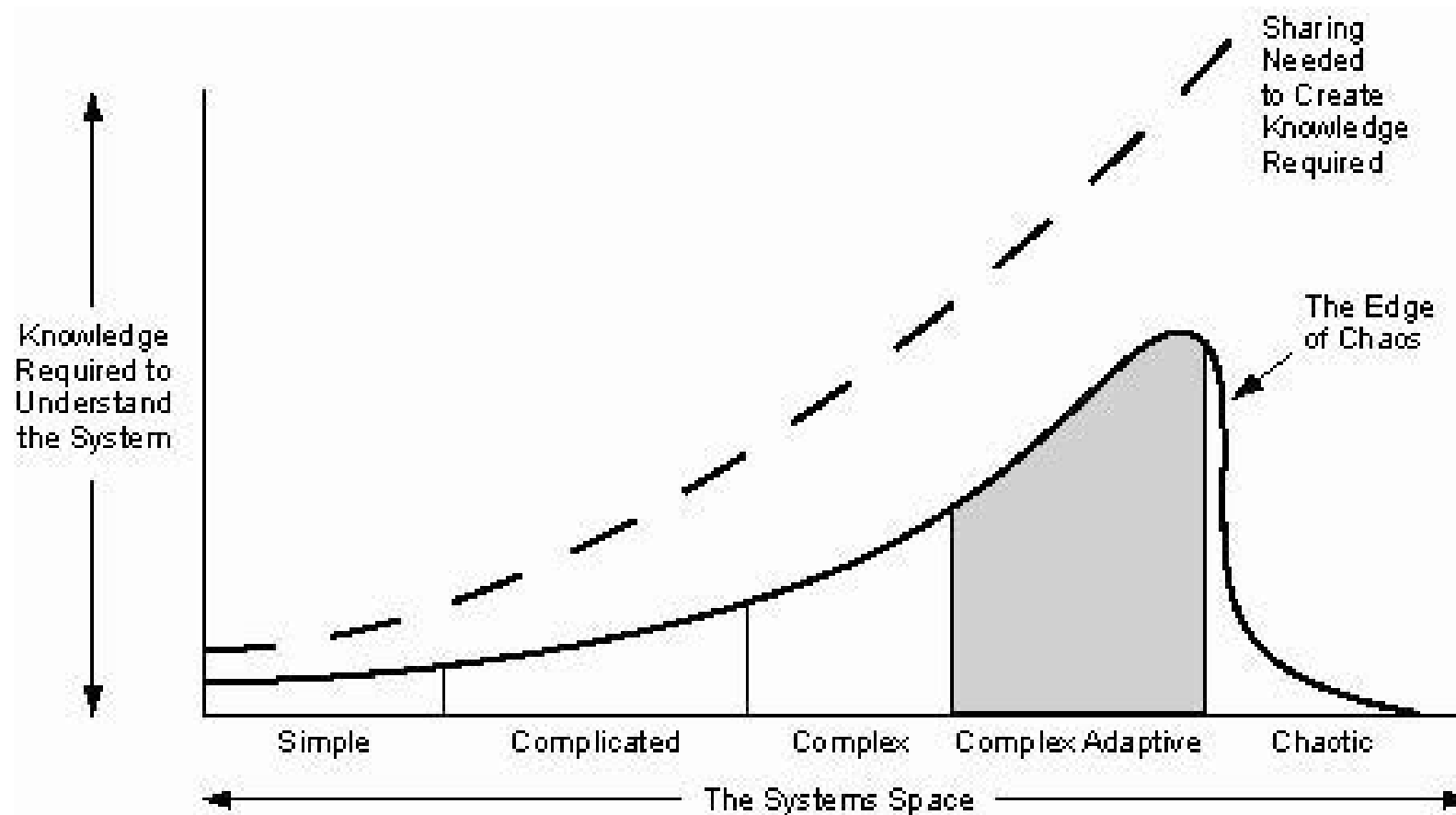
- A system or situation that has some degree of order but has too many elements and relationships to understand in simple cause and effect relationships.
- The amount of variety or diversity in a system.
- There are degrees of complexity!

# Emergence

Global property of complex adaptive systems that is created through the multiple interactions and reactions of the agents or elements within the system.



# The Complex Systems Space



# Guiding Principles

1. The future is truly unknowable and therefore we must learn to live and deal with uncertainty, surprise, paradox, and complexity.
2. Over time complexity increases in complex adaptive systems. Complex adaptive systems evolve and survive by learning, adapting, and influencing their environment, thereby increasing their own complexity.
3. Complex systems generate emergent characteristics through the rich and myriad relationships among their agents. These emergent properties may be volatile and hard to control because a few agents can make changes that may propagate through the structure via nonlinear reinforcing feedback loops. Relative stable emergent patterns such as cultures may also arise. The way to influence complex systems is to create, nurture, and modify their emergent phenomena.
4. Complex adaptive systems cannot be controlled, they can only be nurtured.
5. When two complex adaptive systems are interacting, the one with the greatest variety will dominate. However, too much variety may lead to chaos.

# Guiding Principles

5. When two complex adaptive systems are interacting, the one with the greatest variety will dominate. However, too much variety may lead to chaos.
6. Diversity, innovation, selection, interaction, and self-organization are critical for the evolution and adaptation of complex systems.
7. Complex adaptive systems cannot be highly efficient and survive in a complex, dynamic environment. High efficiency leaves no room for creativity, learning, or exploration. A certain level of noise is needed to maintain the system's ability to learn, change, and adapt.
8. Effective structures are essential to a complex adaptive system that can survive in a complex environment. Structures influence relationships. Relationships determine interactions, patterns and actions. Actions create events.
9. Self-organization encourages a diversity of patterns to develop, optimizing the interactions among people (as perceived by themselves) and creating more options for actions.

# Guidelines for Use

- Understand complex adaptive systems.
- Review history and context.
- Look for emergent characteristics.
- Analyze the networks.
- Remember knowledge is king.
- More nurturing, less control.
- Use all available mental resources.
- Seek optimum complexity.
- Beware simplicity.
- Self-organize your own learning.
- Expect mistakes.
- Amplify what works and change what does not work.

# Benefits of Complexity Thinking

## FOR ORGANIZATIONS:

- Increases awareness and understanding of the importance and necessity of facing the oncoming problems of uncertainty, rapid change, and complexity.
- Events, patterns, and structure are better understood in terms that make decisions more effective.
- Provides a rationale and a path to building a flexible and adaptive organization better able to achieve sustainable high performance in a complex environment.
- Suggests an entirely new set of questions relative to organizational problems and management issues.
- Improves organizational performance by suggesting a new approach to the efficiency-effectiveness problem.

# Benefits of Complexity Thinking

## FOR LEADERS AND MANAGERS:

- Provides a broad context within which leaders and managers can understand and improve their decisions relative to organizational strategies and performance improvement.
- The value of structure and relationships is made visible and gives managers more options and ideas for reorganizing and solving problems.
- Encourages leaders to rethink and consider other options to their past approaches to organizational structure and leadership and management.
- Leaders better understand the importance and advantage of diversity, empowerment, and self-organization.

# Benefits of Complexity Thinking

## FOR KNOWLEDGE WORKERS:

- Provides an understanding of complexity and techniques to deal with complex problems
- Makes visible the value of divergent thinking and the need to create new ideas and options for action.
- Puts complex adaptive systems in perspective relative to chaos and complex systems and explains the need for KM, knowledge leveraging, and learning.

# The Age of Complexity

- Learning capacity > experience
- Leadership > knowledge
- Effectiveness > efficiency
- Nurturing > controlling
- Intuition > logic
- Context > facts
- Patterns > events
- Structure > patterns

> → May be more important than...

# A BRIEF REMINDER

- *The capacity to learn may be more important than experience.*
- *Leadership may be more important than the knowledge one possesses.*
- *Effectiveness may be more important than efficiency.*
- *Teams may be more effective than individuals.*
- *Nurturing may be more effective than controlling.*
- *Intuition is often better than logic.*
- *Understanding and meaning may be more important than analysis.*
- *Context may be more important than facts.*
- *Patterns may be more important than events.*
- *Structures may be more important than patterns.*