



**Systems Thinking: The Fifth Discipline of Learning Organizations**  
**By Marty Jacobs**  
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*“The problems we have created in the world today will not be solved by the level of thinking that created them.”*

*-Albert Einstein*

Although the field of systems thinking had not yet hatched at the time of this quote, it is clear that Einstein already knew about systems thinking, even if he didn't call it that. He was able to recognize that if we continually approached problems in the same way, we would continue to get the same outcomes. We humans are creatures of habit, and we often find it difficult to recognize patterns of behavior that are counterproductive. Systems thinking offers tools and processes that enable organizations to see patterns and connections, leading to greater productivity.

**What is a system?**

According to *Merriam Webster's Collegiate Dictionary, Tenth Edition*, a system is “a regularly interacting or interdependent group of items forming a unified whole.” The key words in this definition are “interdependent” and “unified whole.” A pile of rocks is not a system because they do not interact with each other, and you do not really change anything by adding to it or taking away from it. However, if you take that pile of rocks and create a stone wall, you now have a system. Adding or removing a stone can create havoc. This stone wall system is more than just the sum of its parts; these stones work together to create something much greater than a pile of rocks.

Systems can range from very simple (filling a glass of water) to extremely complex (climate change) and are constantly working to maintain a level of stability. They do so by creating feedback loops using inputs and outputs. To understand systems in greater depth, let's take a look at a simple system: driving a car. Inputs into this system are the desired destination, actions of the driver, and the driving conditions. The output is the car moving in the desired direction. As we drive, however, we are receiving continual feedback. We may see a small child in a yard ahead, playing with a ball, and we instinctively slow down. It begins to rain, and we turn the headlights and wipers on and lower our speed. We see another car on the entrance ramp of the highway as we approach, make a quick check to the side mirror and behind, and then move into

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the passing lane. All these inputs influence the system, but because we have a clear goal in mind, we generally tend to stay on track.

Organizational systems are more complex than this. There are two distinct sections of an organizational system, the internal system and the external system. The internal system consists of a variety of parts, including the products or services produced, personnel, the materials and tools used to create products or services, the relationships that people have with each other – this list could be endless. The external system is everything outside the organization that influences it: competitors, the economy, the condition of the financial industry, the environment, regulations, the political landscape, and the community, to name a few. Both the internal and external systems are not only interacting within themselves but are also interacting with each other. Observing and understanding these interactions is the crux of systems thinking.

### **What is systems thinking?**

The discipline of systems thinking evolved from the field of systems dynamics and is both a set of tools and a new way of thinking involving new language. In systems thinking, we look at the whole system rather than trying to break it down into its individual parts; that is, we become expansive in our thinking rather than reductive. By looking at the whole, we are more capable of seeing interrelationships and patterns over time. We also begin to understand that the presenting problem may be symptomatic of deeper issues within the system, and so we start looking for the root causes. In doing so, we move away from assigning blame and focus on the desired outcomes.

Systems thinking is proactive and circular in nature, as opposed to linear thinking, which tends to be reactive. There are three key concepts of systems thinking: reinforcing feedback, balancing feedback, and delays. Reinforcing or amplifying feedback loops are what fuel growth or create decline in systems. They either spiral up or down, although they rarely occur in isolation. There are limits both to growth and decline. A simple example of a reinforcing loop is how an organization's productivity can influence growth which, in turn, influences financial rewards which comes full circle to influence productivity. This loop can move in either a positive direction or a negative direction but ultimately stops at an outer limit.

Balancing or stabilizing feedback loops are those that attempt to maintain equilibrium. These systems are goal oriented and will do whatever is necessary to reach or maintain that goal. The previous example of driving a car is a balancing loop because the goal is to reach the desired destination. The driver will do what it takes to reach that destination in a safe and efficient manner. In organizations we are bumping up against a balancing loop when our attempts to make change only bring us back to where we started. We are encountering resistance to change because the existing system is attempting to maintain a particular goal. That goal, however, may not be obvious; we may find we need to uncover the mental models that are keeping that system in place before we have any hope of changing it.

Delays are inevitable in any system but are often not recognized. Delays cause instability in systems, and aggressive action to compensate for delays will likely cause organizations to overshoot or undershoot. To illustrate, let's use the example of a thermostat. These days with energy prices heading through the roof, many of us have developed the habit of setting the thermostat back at night to conserve energy. On those particularly frosty mornings, it is tempting to turn the heat up higher than necessary in the morning, but unlike a stove burner, turning the temperature up higher will not produce more heat. There is a delay from when the heat is turned up to when the room reaches its target temperature. If the heat is set higher than necessary, then the room will become overheated. In reaction to that, we set the heat back to cool the room off, but then the temperature drops too low and we once again set the heat up again. This might go on forever if we weren't capable of learning from our actions. In systems thinking, it is crucial to develop the patience to weather delays and not to react too quickly to changes in the system.

### **What are the characteristics of systems thinkers?**

According to *The Systems Thinking Playbook*, (pp. 3-4), a systems thinker is one who:

- Sees the whole picture.
- Changes perspectives to see new leverage points in complex systems.
- Looks for interdependencies.
- Considers how mental models create our futures.
- Pays attention and gives voice to the long-term.
- “Goes wide” (uses peripheral vision) to see complex cause and effect relationships.
- Finds where unanticipated consequences emerge.
- Lowers the “water line” to focus on structure, not blame.
- Holds the tension of paradox and controversy without trying to resolve it quickly.

Systems thinkers are those who think outside the box. They understand that there are no right answers, only different paths to the same outcomes. They realize that quick fixes will most likely lead right back to where they started from and thus develop patience with the idea that cause and effect are not closely related in time and space. They understand that things may get worse before they get better, but they have learned to take the long view. In doing so, they are able to tap the creative synergy that exists in organizations.

### **How do organizations apply systems thinking?**

As with the previous four disciplines, there are a variety of ways to implement systems thinking within an organization, and each organization must find what fits well within the organizational culture. However, there are key aspects of systems thinking to consider. Below is one possible approach that includes these key aspects:

**Events:** Begin the practice of systems thinking by telling the story of the current situation. It is important to hear as many perspectives as possible. However, don't jump to solutions immediately. It may be necessary to provide a quick fix but do so with the understanding that it

is a stopgap measure that is not designed for long-term solutions. Meanwhile, explore the nature of the event or problem in greater detail.

***Patterns of behavior:*** Track the situation over a period of time. Look for patterns and trends that go below the surface. Go back in history, if you've got the data. Those patterns are key indicators for the system.

***Systemic structure:*** Look for interrelationships in the patterns and trends you've discovered. Look for balancing and reinforcing feedback and identify delays in the system. Uncover the mental models that are driving these patterns.

***Mental models:*** Create new mental models to introduce change into the system. Be patient – there will be delays, and things may get worse before they get better. Track and evaluate the effects of the changes. Determine if there are unintended consequences and decide what needs tweaking.

Although this might sound like a relatively straightforward process, it is far from it. There are many challenges to implementing systems thinking, the biggest of which is traditions and/or habits. Patterns of behavior are hard to recognize and even harder to change, and we often feel pressure to act quickly with little or no systemic information. Finding the balance between attending to the present and creating the future is never easy.

### **What are the benefits of systems thinking?**

Systems thinking is the thread that ties the other four disciplines of organizational learning together. Organizations engaging in systems thinking are able to:

- Develop new ways of looking at old problems.
- Integrate new information more easily.
- See interrelationships and cause and effect more clearly.
- Develop patience with implementing change and tolerating delays.
- Step away from the blame game toward shared responsibility.
- See the whole rather than the parts.

Although each of the above benefits can take an inordinate amount of time to master, the investment in developing systems thinkers is worth the time and effort. Ultimately, organizations practicing systems thinking will be able to step up to that next level of thinking in order to solve problems and create their desired futures. They will have greater control over their destiny and be more nimble in responding to environmental changes. What better way to stay one step ahead of the competition?

In my final article of this series, I will focus on how to integrate the five disciplines to create learning organizations.

Resources:

*The Fifth Discipline: The Art and Practice of The Learning Organization*, Peter M. Senge, 1990.

*The Fifth Discipline Fieldbook*, Peter M. Senge, Art Kleiner, Charlotte Roberts, Richard B. Ross, and Bryan J. Smith, 1994.

*Systems One: An Introduction to Systems Thinking*, Draper L. Kauffman, Jr., 1980.

*The Systems Thinking Playbook*, Linda Booth Sweeney and Dennis Meadows, 1995.

Society for Organizational Learning (SoL) (<http://www.solonline.org/>).

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