



Applied Systems Thinking

Use the Power of Structure to Create Lasting Change

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Introduction Article 2

"System Thinking as a Language"

by Michael Goodman

In this article, Michael Goodman describes Systems Thinking as a language that opens up new ways of thinking.

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SYSTEMS THINKING AS A LANGUAGE

BY MICHAEL GOODMAN

Language has a subtle, yet powerful effect on the way we view the world. English, like most other Western languages, is linear—its basic sentence construction, noun-verb-noun, translates into a worldview of “x causes y.” This linearity predisposes us to focus on one-way relationships rather than circular or mutually causative ones, where x influences y, and y in turn influences x. Unfortunately, many of the most vexing problems confronting managers and corporations today are caused by a web of tightly interconnected circular relationships. To enhance our understanding and communication of such problems, we need a language more naturally suited to the task.

Elements of the Language

Systems thinking can be thought of as a language for communicating about complexities and interdependencies. In particular, the following qualities make systems thinking a useful framework for discussing and analyzing complex issues:

- **Focuses on ‘closed interdependencies.’** The language of systems thinking is circular rather than linear. It focuses on closed interdependencies, where x influences y, y influences z, and z influences x.
- **A ‘visual’ language.** Many of the systems thinking tools—causal loop diagrams, behavior-over-time diagrams, systems archetypes, and structural diagrams—have a strong visual component. They help clarify complex issues by summing up, concisely and clearly, the key elements involved.

Diagrams also facilitate learning. Studies have shown that many people learn best through representational images, such as pictures or stories. A systems diagram is a powerful means of communication because it distills the essence of a problem into a format that can be easily remembered, yet is rich in

implications and insights.

- **Adds precision.** The specific set of “syntactical” rules that govern systems diagrams greatly reduce the ambiguities and miscommunications that can occur when tackling complex issues.

Example: In drawing out the relationships between key aspects of a problem, causal links are not only indicated by arrows, but are labeled “s” (same) or “o” (opposite) to specify how one variable affects another. Such labeling makes the nature of the relationship more precise, ensuring only one possible interpretation.

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- **Forces an ‘explicitness’ of mental models.** The systems thinking language translates “war stories” and individual perceptions of a problem into black-and-white pictures that can reveal subtle differences in viewpoint.

Example: In one systems thinking course, a team of managers was working on an issue they had been wrestling with for months. One manager was explaining his position, tracing through the loops he had drawn, when a team member stopped him. “Does that model represent your thinking about this problem?” he asked.

The presenter hesitated a bit, reviewed his diagram, and finally answered, “Yes.”

The first man, evidently relieved, responded, “After all of these months, I finally *really understand* your thoughts on this issue. I disagree with it, but at least

now that we are clear on our different viewpoints, we can work together to clarify the problem.”

- **Allows examination and inquiry.** Systems diagrams can be powerful means for fostering a collective understanding of a problem. Once individuals have stated their understanding of the problem, they can collaborate on addressing the challenges it poses. And by focusing the discussion on the diagrams, systems thinking defuses much of the defensiveness that can arise in a high-level debate.

Example: When carrying on a systems discussion, differing opinions are no longer viewed as “human resources’ view of our productivity problem” or “marketing’s description of decreasing customer satisfaction,” but different structural representations of the system. This shifts the focus of the discussion from whether human resources or marketing is *right* to constructing a diagram that best captures the behavior of the system.

- **It embodies a worldview** that looks at wholes, rather than parts, that recognizes the importance of understanding how the different segments of a system are interconnected. An inherent assumption of the systems thinking worldview is that problems are internally generated—we often create our own “worst nightmares.”

Example: At systems thinking courses at Innovation Associates, participants play a board game known as the “Beer Game,” where they assume the position of retailer, wholesaler, distributor, or producer. Each player tries to achieve a careful balance between carrying too much inventory or being backlogged. When things go wrong, many people blame their supplier (“I kept ordering more, but he didn’t respond”) or the buyers (“fickle consumers—one day they’re buying it by the truckload,

the next day they won't even touch the stuff"). In reality, neither the buyers nor the suppliers are responsible for the wide fluctuations in inventory—they are a natural consequence of the *structure* of the system in which the players are functioning.

The systems thinking worldview dispels the “us versus them” mentality by expanding the boundary of our thinking. Within the framework of systems thinking, “us” and “them” are part of the same system and thus responsible for both the problems and their solutions.

Learning the Language

Learning systems thinking can be likened to mastering a foreign language. In school, we studied a foreign language by first memorizing the essential vocabulary words and verb conjugations. Then we began putting together the pieces into simple sentences. In the language of systems thinking, systems diagrams such as causal loops can be thought of as sentences constructed by linking together key variables and indicating the causal relationships between them. By stringing together several loops, we can create a “paragraph” that tells a coherent story about a particular problem under study.

If there were a Berlitz guide to systems thinking, archetypes such as “Fixes

that Backfire” or “Shifting the Burden” would be listed as “commonly used phrases.” They provide a ready-made library of common structures and behaviors that can apply to many situations. Memorizing them can help you recognize a business situation or problem that is exhibiting common symptoms of a systemic breakdown.

Of course, the key to becoming more proficient in any language is to practice—and practice often. When reading a newspaper article, for example, try to “translate” it into a systems perspective:

- take events reported in the newspaper and try to trace out an underlying pattern that is at work,
- check whether it fits one of the systems archetypes, or if it is perhaps a combination of several archetypes,
- then try to sketch out a causal loop or two that captures the structure producing that pattern.

Don't expect to be fluent in systems thinking right away. Remember, after your first few Latin classes, you still couldn't read *The Odyssey*. For that matter, you probably knew only a few key phrases and vocabulary words, but you improved your skills by using it as often as possible. The same holds true for systems thinking.

When sitting in a meeting, see if

you can inform your understanding of a problem by applying a systems perspective. Look for key words that suggest linear thinking is occurring—statements such as “we need more of the same” or “that solution worked for us the last time this happened, why not use it again?” You can also create low-key practice sessions by working with a small team of colleagues to diagram a particular problem or issue.

Becoming Fluent

We say that someone is fluent in a language when they begin to think in that language and no longer have to translate. But fluency means more than just an ability to communicate in a language; it means understanding the surrounding culture of the language—the worldview. As with any foreign language, mastering systems thinking will allow us to fully engage in and absorb the worldview that pervades it. By learning the language of systems thinking, we will hopefully change not only the way we discuss complex issues, but the way we think about them as well. ■

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