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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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anguage 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 influ-
ences 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 rela-
tionships. To en-hance our understanding
and communication of such
problems, we need a language more nat-
urally 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 interdepen-
dencies.' 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 dia-
grams, behavior-over-time diagrams,
systems archetypes, and struct-ural dia-
grams—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 sys-
tems diagrams greatly reduce the am-
biguities and miscommunications that can occur
when tackling complex issues.

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

An inherent assumption of the
systems thinking worldview is
that problems are internally gen-
erated—we often create our own
“worst nightmares.”

• 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 prob-
lem?” 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 under-
standing of a problem. Once individu-
als have stated their understanding of
the problem, they can collaborate on
addressing the challenges it poses. And
by focusing the discussion on the dia-
grams, systems thinking defuses much of
the defensiveness that can arise in a
high-level debate.

Example: When carrying on a sys-
tems 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 mar-
keting 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 under-
standing how the different segments of
a system are interconnected. An inher-
ent assumption of the systems thinking
worldview is that problems are inter-
nally generated—we often create our own
“worst nightmares.”

Example: At systems thinking
courses at Innovation Associates, partici-
pants play a board game known as the
“Beer Game,” where they assume the
position of retailer, wholesaler, distribu-
tor, or producer. Each player tries to
achieve a careful balance between carry-
ing too much inventory or being back-
logged. 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 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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