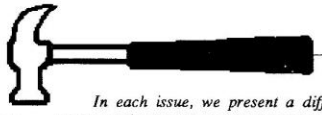

Toolbox

In each issue, we present a different systems tool using relevant business examples. Readers are encouraged to practice using these tools by applying them to issues of personal interest. See page 10 for a symbol key for the diagrams.

The Do's and Don'ts of Systems Thinking on the Job

By Michael Goodman

So you've taken a systems thinking course—or maybe you've read a few issues of *The Systems Thinker*—and now you want to start using systems thinking on the job. How do you begin? Your best bet is to approach this endeavor in the spirit of "learning to walk before you run." Here are some suggestions:

Overall Guideline

The tools of systems thinking are best used as a vehicle to promote team learning in the organization. Whether you are doing "paper and pencil" models or creating full-fledged microworlds, the process of constructing and using models is primarily about exploring and examining our "mental models"—the deeply held assumptions that influence the way we think and act.

General Guidelines

DON'T use systems thinking to further your own agenda. Systems thinking is most effective when it is used to look at a problem in a new way, not to advocate a pre-determined solution. Strong advocacy will create resistance—both to your ideas, and to systems thinking. It should be used in the spirit of inquiry, not inquisition.

DO use systems thinking to sift out major issues and factors.

Benefit: systems thinking can help you break through the clutter of everyday events to recognize general patterns of behavior and the structures that are producing them. It also helps in separating solutions from underlying problems. Too often we identify problems in terms of their solution; for example "the problem is that we have too many ___ (fill in the blank: people, initiatives, steps in our process)," or "the problem is that we have too little ___ (resources, information, budget...)."

DON'T use systems thinking to blame individuals. Chronic unresolved problems are more often the result of systemic breakdowns than individual mistakes. Solutions to these problems lie at the systemic, not the individual, level.

DO use systems thinking to promote inquiry and challenge pre-conceived ideas.

Cues that non-systemic thinking is going on: Using phrases such as "We need to have immediate results," "We just have to do *more* of what we did last time," or "It's just a matter of trying harder."

Getting Started

DON'T attempt to solve a problem immediately. Don't expect persistent and complex systemic problems to be represented, much less understood, overnight. The time and concentration required should be proportional to the difficulty and scope of the issues involved.

More realistic goal: to achieve a fuller and wider understanding of the problem.

DO start with smaller-scale problems.

DON'T attempt to diagram the whole system—otherwise you'll quickly become overwhelmed.

Better: try to focus on a problem issue and draw the minimum variables and loops you'll need to capture the problem.

DON'T work with systems thinking techniques "on line" under pressure, or in front of a group that is unprepared for or intolerant of the learning process.

Additional danger: if the audience is not familiar with the concepts and methods of systems thinking, they might not understand that the process reveals mental models, can be controversial, and is highly iterative in nature. It is far more beneficial to have the group engage in their own loop building after appropriate instruction and foundation has been given.

DO develop your diagrams gradually and informally, in

Continued on next page

Identifying a Systems Problem

The problem should have ALL of the following characteristics:

1. The issue is important to me and my business.
2. The problem is chronic, rather than a one-time event.
3. The problem has a known history which I can describe. *Example*: Profits were steady for 2 years, but have been declining for the last 6 months. Or: Productivity rose rapidly until about a year ago when it leveled off.
4. People have tried to solve this problem before, with little or no success.

If your problem does not have all of these characteristics (especially the first three), it may not be appropriate for a systems thinking analysis. Try redefining it for a different approach.

Toolbox

Continued from previous page

order to build confidence in using systems thinking.

Good practice: look at newspaper articles and try to draw a few loops that capture the dynamics of a problem being described. *Even better*: try matching a template to the article.

DON'T worry about drawing loops right away. One of the strongest benefits of the systems thinking perspective is that it can help you learn to ask the right questions. This is an important first step towards understanding a problem.

Drawing Diagrams

DO start with the process of defining variables. **DO** encourage airing of assumptions.

Benefit: better shared understanding of a problem. Diagramming is a very effective tool for promoting group inquiry into a problem or issue.

DO start with a central loop or process. Then add additional loops to "fill in" detail.

Example: the central loop may show how the system is *supposed* to work, and the additional loops can explore what is pushing it out of whack.

DON'T get bogged down in details. Start simply, at a high level of generalization, but with enough detail to sum up the observed behavior.

Example: if you are exploring the causes of missed delivery dates in a factory, lump together the types of products that are experiencing similar delays.

DO begin by looking for templates or general structures that might clarify the problem.

Advantage: Systems archetypes provide a focal point or a storyline to begin the process of understanding a problem.

DO work with one or more partners.

Advantage: multiple viewpoints add richness and detail to the understanding of a problem.

DO check with others to see if they can add some insight or improve upon your diagram—especially people in other functional areas who might have a different perspective on the problem.

Example: with a manufacturing delay problem, you might check with finance to see if there are any dynamics in the finance arena that are effecting the manufacturing delays (capital investments and purchases, etc.). The same can be done for marketing, sales, etc.

DO work iteratively. There is no "final" model (set of loops). Looping is a learning process which should continue to evolve with new data and perspectives.

DON'T present "final" loop diagrams as finished products.

Better: Present as a tentative and evolving picture of how you are seeing things. To gain buy-in and maximize learning, the audience needs to participate in the modeling process.

DO learn from past history. When possible, check data to see if your diagram correctly describes past behavior.

Interventions

DO get all stakeholders involved in the process. This will help insure that all viewpoints have been considered, and will improve the acceptance rate for the intervention.

DON'T go for vague, general, or open-ended solutions such as "Improve communications."

Better: "Reduce the information delay between sales and manufacturing by creating a new information system."

DO make an intervention specific, measurable and verifiable.

Example: "Cut the information delay between sales and manufacturing down to 24 hours."

DO look for potential unintended side-effects of an intervention.

General principle: "Today's problems often come from yesterday's solutions." Any solution is bound to have trade-offs, so use systems thinking to explore the implications of any proposed solution *before* trying to implement it.

DON'T be surprised if some situations defy solution, especially if they are chronic problems. Rushing to action can thwart learning and ultimately undermine efforts to identify higher leverage interventions. Resist the tendency to "solve" the issue and focus on gaining a deeper understanding of the structures producing the problem. Be wary of a symptomatic fix disguised as a long-term, high-leverage intervention.

Michael Goodman is vice president of Innovation Associates, Framingham, MA. The material in this article was drawn from his 20 years of experience in the field, as well as business courses developed by Innovation Associates.

Guidelines for Interventions

1. To be effective, an intervention must be self-sustaining, self-correcting and long-lasting. It must make long-term changes in the performance trend.
2. Types of Interventions in a Causal Loop Diagram:
   - Add a link
   - Break a link
   - Shorten a delay
   - Make a goal explicit
   - Slow down a growth process; relieve a limiting process
3. The best intervention is likely to be a combination of interventions applied gently and patiently.
4. Avoid pushing on a structure from the outside.
5. Look for variance between long- and short-term impacts, to anticipate unexpected effects.