The Crisis Syndrome: When Archetypes Gang Up

Bob Powell, Continuous Improvement Associates

Summary

A combination of systems thinking archetypes (or structures) keeps individuals and organizations trapped in behaviors that favor either a symptomatic solution, providing only short-term relief, or an external solution, leaving us dependent on an intervenor (i.e., in dependency). The "Addiction," "Fixes That Fail," "Shifting the Burden," "Eroding Goals" and "Escalation" archetypes[1] combine to form a "Crisis Syndrome," an extraordinarily powerful combination that creates a super-addictive trap.[2]

Perhaps the only way to extricate ourselves from this structure is to exercise discipline. In *The Road Less Traveled*, Scott Peck defines discipline as "a system of techniques of dealing constructively with the pain of problem-solving — instead of avoiding that pain — in such a way that all of life's problems can be solved."[3] Further, Peck goes on to say that the source of the willingness, energy, strength, and courage to apply discipline is love, which comes from a spiritual source.

After describing this combination of structures, this paper shows how Scott Peck's disciplines can help us overcome this structure's tendency to lead us into personal crisis. Further, it describes how the same structure applies as much to organizations as it does to individuals, with "Values, Purpose and Envisioned Future" being the counterpart to "love." It also shows that the "process capability trap" described by Repenning and Sterman is a specific example of portions of this generic structure.[4]

Next, this paper describes the one-to-one correspondence between the ways individuals can escape addiction and the ways organizations can focus on the long term, instead of the quick fix.

Finally, we show the parallels between Scott Peck's four basic techniques of discipline and the prescriptions for organizational health from systems thinking and organizational learning.

The General Problem

In general, we take corrective action when the perceived health of some system is too low (note that individuals and organizations are "systems"). It could be that a person's "perceived quality of life" is too low or, for a company, the perception could be that it's production/distribution system has excessive problems.

However, because of perception delays, there is a difference between the *perceived* health of a system, and the *actual* health of a system. The root of the problem that develops is that we tend to apply corrective action to *perceived* health, rather than to *actual* health. Too often, this leads us to apply an action that helps in the short-run, but hurts in the long run.

Doing so sets off chains of influences that create a combination of structures we call "The Crisis Syndrome." These structures exert tremendous pressure on us to favor either a symptomatic solution, providing only short-term relief, or an external solution, leaving us dependent on an intervenor (i.e., in dependency).

The Problem for Individuals

The diagrams that follow illustrate this dynamic for the case of individual drug addiction. They progressively build on a basic balancing feedback loop that is initially meant to improve our lives. The diagrams first show the influences that create the Crisis Syndrome; then they show influences that can extricate us from it.

Stage 1: A fix

Figure 1 shows that to address the perception that "perceived quality of life" is too low, we apply a fix, a balancing loop **B1**, *The Quick Fix*. The fix could be to take drugs, or to overeat, or … we can all name our own favorite personal addiction.

The difference between our "target quality of life" and our "perceived quality of life," is the "quality of life gap."[5]

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1. "Archetypes" are fundamental structures that have been observed to occur often in systems. It comes from the Greek *archetypos*, meaning "first of it's kind." (See Senge et al., *The Fifth Discipline Fieldbook*, p. 121.)
2. The idea for this paper came from a presentation by Dennis Meadows on "Shifting Dominance" at the 1997 *Power of Systems Thinking* conference.
3. M. Scott Peck, *The Road Less Traveled*, 1980, p. 77.
4. Repenning & Sterman, "Nobody Ever Gets Credit for Fixing Problems that Never Happened: Creating and Sustaining Process Improvement," 2000, http://web.mit.edu
5. For an explanation of the language of causal loops and the "S" and "O" notation, see Appendix I. A Brief Introduction to Systems

The greater the "quality of life gap," the more we tend toward "use of drug of choice" so we'll feel better. The resulting "drug high" then increases our "perceived quality of life." This makes us feel better and closes the "quality of life gap."

Stage 2: … but drugs wear off

Figure 2 shows that the first difficulty with applying this fix is that it doesn't last. The fix wears off and we need another. Balancing loop **B2**, *Time for Another Fix*, represents the outflow of a fraction of the stock of drug in our system in a given time period. This balancing loop is the decay of the effectiveness of the fix; the drug wears off and another dose is required.

This is often the case when we only address the symptoms of pain. The caffeine from coffee wears off and we need another cup. The nicotine from a cigarette wears off and we need another. We take an aspirin and later need another.

Stage 3: A fix that fails - the addiction archetype

A really serious problem is that, while the drug high affects us immediately, it also causes the deterioration of mind and body.

Loop **R3**, *The Downhill Slide* in Figure 3, represents the delayed negative impact of the use of drugs. In the figure, "quality of life" is our *actual quality of life*. The lines across the links indicates a delay; it takes time for the drugs to affect "quality of life" and longer still for us to perceive the deterioration.

As actual "quality of life" deteriorates, we need *even more* drug to help us feel as well as we did before.

When we hit a "bump in the road" and try to make ourselves *feel better fast* by taking a drug that has long term negative side-effects, this structure alone can lead to a downhill slide. It's a "Fix that Fails" archetype[6] (**B1** & **R3**) with an added balancing loop (**B2**) that quickly drains off the good feeling associated with the fix … prompting more use of the drug.

While I've not seen this structure cited as an

Figure 1. Stage 1. A fix - feel better fast!
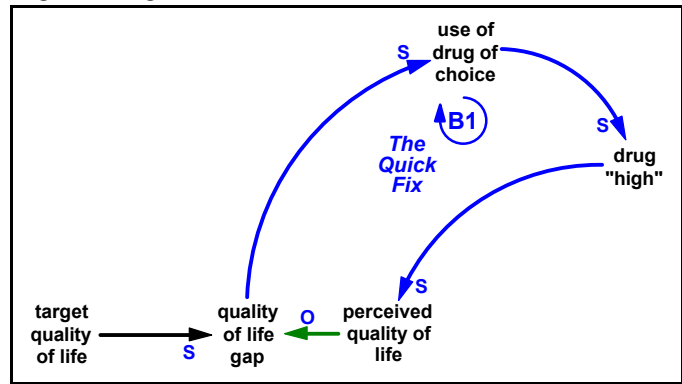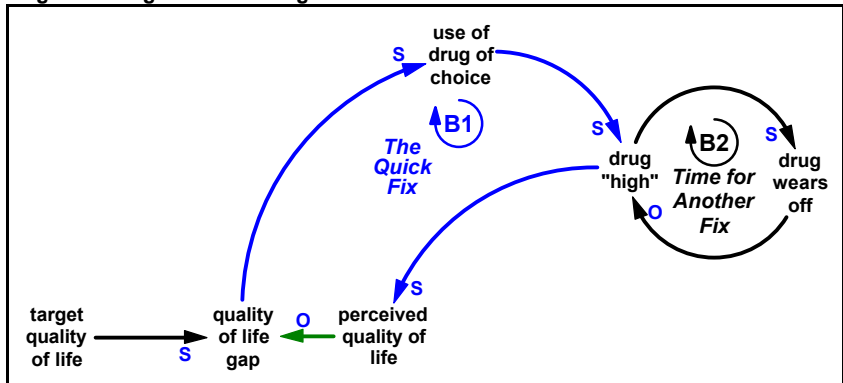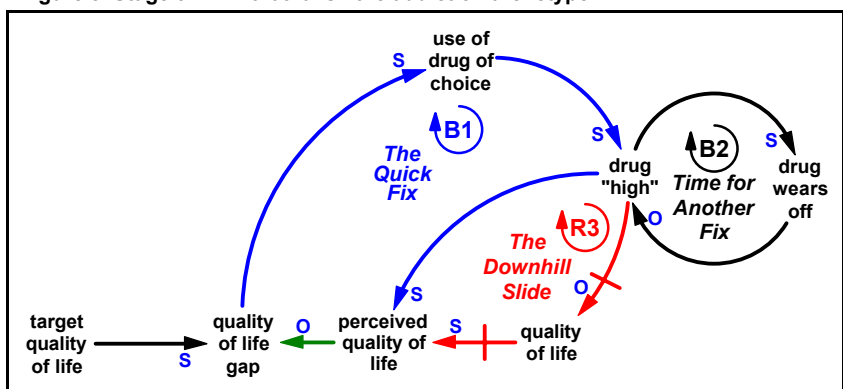

Figure 2. Stage 2: … but drugs wear off

Figure 3. Stage 3: A fix that fails - the addiction archetype

"Addiction" archetype, it's prevalent and powerful. Perhaps it deserves that special recognition.[7]

Stage 4: The choice

Figure 4 shows we do have alternatives to drugs. We could "work on life skills" to produce a positive "change in quality of life skills," increasing actual "quality of life." This would increase adaptability and address root causes of lower "perceived quality of life."

Loop **B4**, *Focus on Fundamentals* shows this alternative. But this takes longer, because of the significant

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Diagrams. Note that "quality of life gap" = "target quality of life" - "perceived quality of life."

6   A "Fix that Fails" structure is a balancing loop that we hope will compensate for a condition in combination with a reinforcing loop that, after a delay, makes the situation even worse.

7   This Addiction structure is a recasting of the diagram from Donnella H. Meadows' paper, "Whole Earth Models & Systems," from *The Co-Evolution* Quarterly, Summer 1982, reprinted in *Modeling for Management*, p. 98. The diagram is redrawn for better compatibility with the Shifting the Burden structure to be shown below.

delays associated with a positive "change in quality of life skills" and then using them to see an impact on actual "quality of life".

So working on the long-term solution, **B4**, *Focus on Fundamentals*, often doesn't seem as attractive as **B1**, *The Quick Fix*. Figure 5 shows this is especially so because new ways of being and new skills are cause "discomfort;" they can seem unnatural. Loop **R5**, *This Doesn't Feel Natural*, shows that our "perceived quality of life" can actually *seem* lower, which results in a tendency to not pursue a new way of being, no matter how worthwhile.

Loops **B4** and **R5** also have the same form as a "Fix that Fails" archetype, a combination of a balancing loop and a reinforcing loop with a longer delay. In the standard "Fix that Fails" structure, the "fix" balancing loop yields early benefits, and the reinforcing loop "failure" happens after some delay as the negative side effects kick in.

However, the **B4** / **R5** combination of might be called "Corrective Action that Fails." Here, an appropriate corrective action takes a long time to yield benefits, but we immediately feel the negative side effects.

Stage 5: The burden shifts

Figure 6 shows that the use of drugs also has the side-effect of robbing us of the discipline to work on our life skills. This creates reinforcing loop **R6**, *No Time for Fundamentals* … a "Shifting the Burden" archetype.[8]

We know we'd be better off if we'd "work on life skills" instead of take drugs, but the drugs rob us of the time and energy to do so.

Stage 6: Eroding goals

This structure contains a comparison between the "perceived state of the system" and the "target state of the system." This the "gap."

Figure 4. Stage 4: The choice … addiction or adaptation
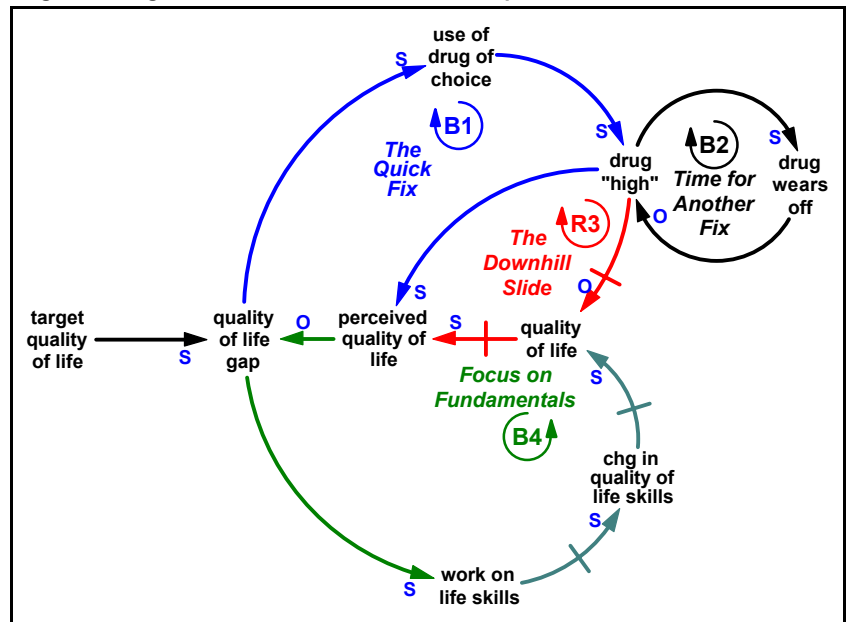
Figure 5 … it takes time, … and it's uncomfortable
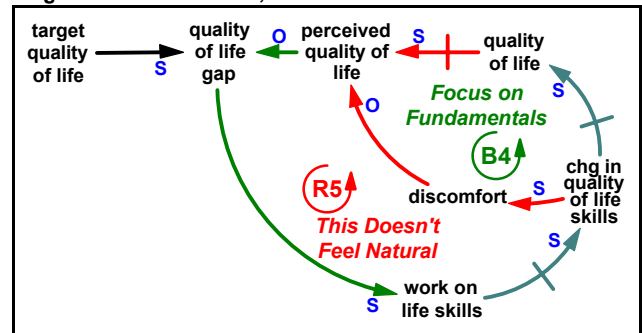
Figure 6. Stage 5: The burden shifts
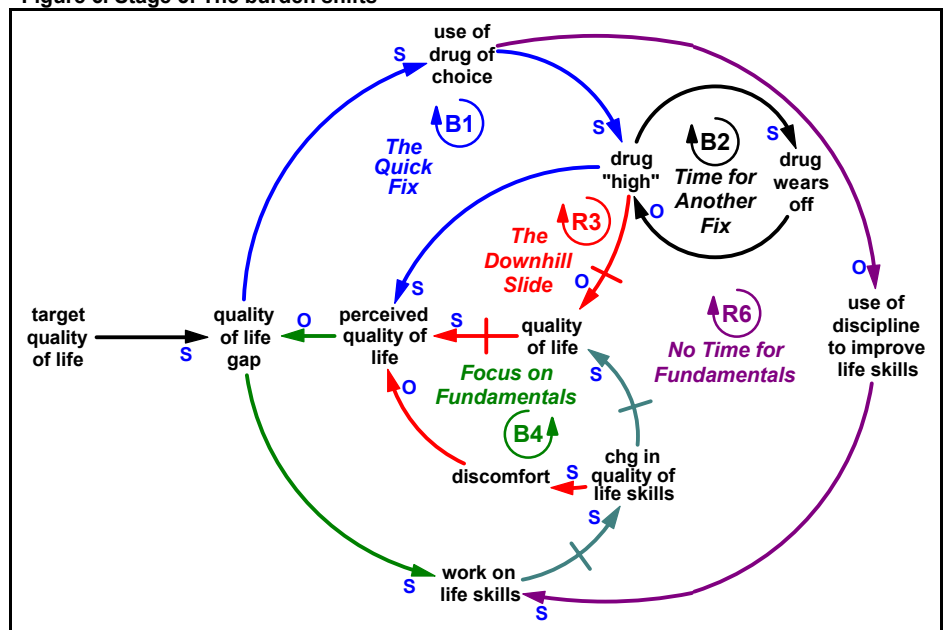
Now there are two ways to close the gap. We can either work to increase the "perceived state of the system" or we can relax and simply decrease the "tar-

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8   As noted above, a "Shifting the Burden" structure can be address a *symptom* of a problem instead of the *fundamental cause*, or it can shift the burden to an *intervenor*, rather than *building basic capability*.

get state of the system." Often, it's really attractive to just lower the target.

This is the "Eroding Goals" structure, which Figure 7 shows as Loop **B7**, *Things Could Be Worse*. Figure 8 shows that when this balancing loop combines with balancing loop **B4**, *Focus on Fundamentals*, it forms a "figure 8" that produces an escalating action: lowering the target leads to less work, which allows quality of life skills to erode over time; this leads to a lower quality of life and even more temptation to lower the target.

One could observe that **B7** and **B1** could also produce an escalation leading to less use of drugs … however that won't happen because **B1** is still driven by the addictive power of **B2** & **R3**.

Altogether Now

So, as if the basic addiction structure weren't powerful enough, the "Addiction," "Fixes that Fail," "Shifting the Burden," "Escalation" and "Eroding Goals" structures all gang up to create a powerful combination that can drive "quality of life" downhill. Fast. This is what we call the Crisis Syndrome.

Addiction is very possibly the greatest of the challenges we have as humans.[9] When we get caught in this downward spiral and "hit bottom," either we bounce or we die. "Every year about half a million men, women, and children in the United States die from the effects of using nicotine, alcohol, and illegal drugs: one of every four American deaths." [10]

How Individuals Escape

If we could somehow increase our use of discipline, we could activate loop **B4**, *Focus on Fundamentals*.

For insight on the source of discipline, we can look to the wisdom in *The Road Less Traveled* by M. Scott Peck. He defines discipline to be "a system of techniques of dealing constructively with the pain of problem-solving — instead of avoiding that pain — in such a way that all of life's problems can be solved."[11]

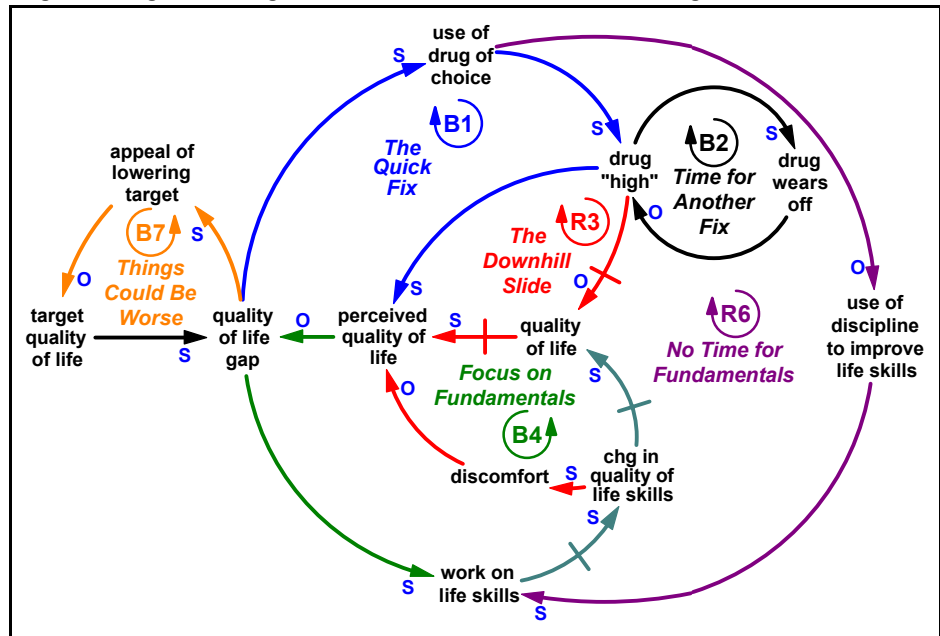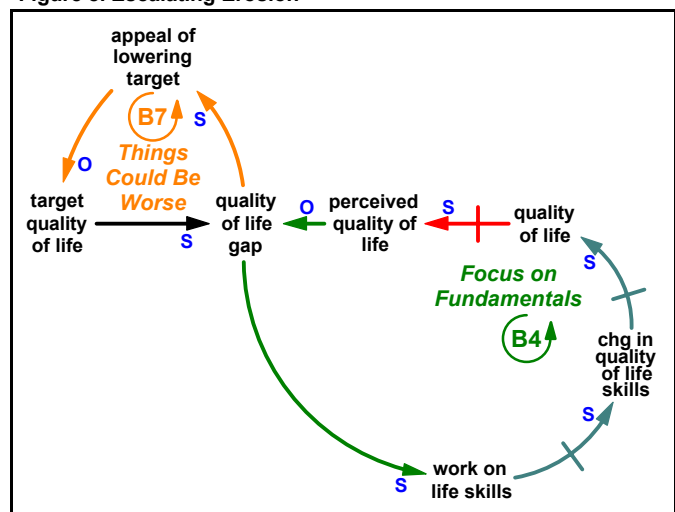Figure 7. Stage 6: Eroding Goals … it's much easier to lower the target

Figure 8. Escalating Erosion

His four basic techniques of discipline are:

- **delaying gratification** - "the process of scheduling the pain and pleasure of life in such a way as to enhance the pleasure by meeting and experiencing the pain first and getting it over with. It is the only decent way to live."[12]

- **assumption of responsibility** - the alternative to accepting responsibility is to escape from freedom … to put someone else in charge.

- **dedication to the truth or reality** - an openness to challenges to our map of reality.

- **balancing** - an ability for flexible response (e.g., live in the moment *and* plan for the future).

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9   At the heart of Buddhism is the need to "let go" of our attachments.
10 "Dispelling the Myths About Addiction: Strategies to Increase Understanding and Strengthen Research," Committee to Identify Strategies to Raise the Profile of Substance Abuse and Alcoholism, Research Institute of Medicine
11 M. Scott Peck, *The Road Less Traveled*, 1980, p. 77.
12 M. Scott Peck, *The Road Less Traveled*, 1980, p. 19.

Figure 9. Scott Peck's Disciplines and their Source

Disciplines

Deferred Gratification

Dedication to the Truth, Reality

Responsibility

Balancing

Require

strength
energy
willingness
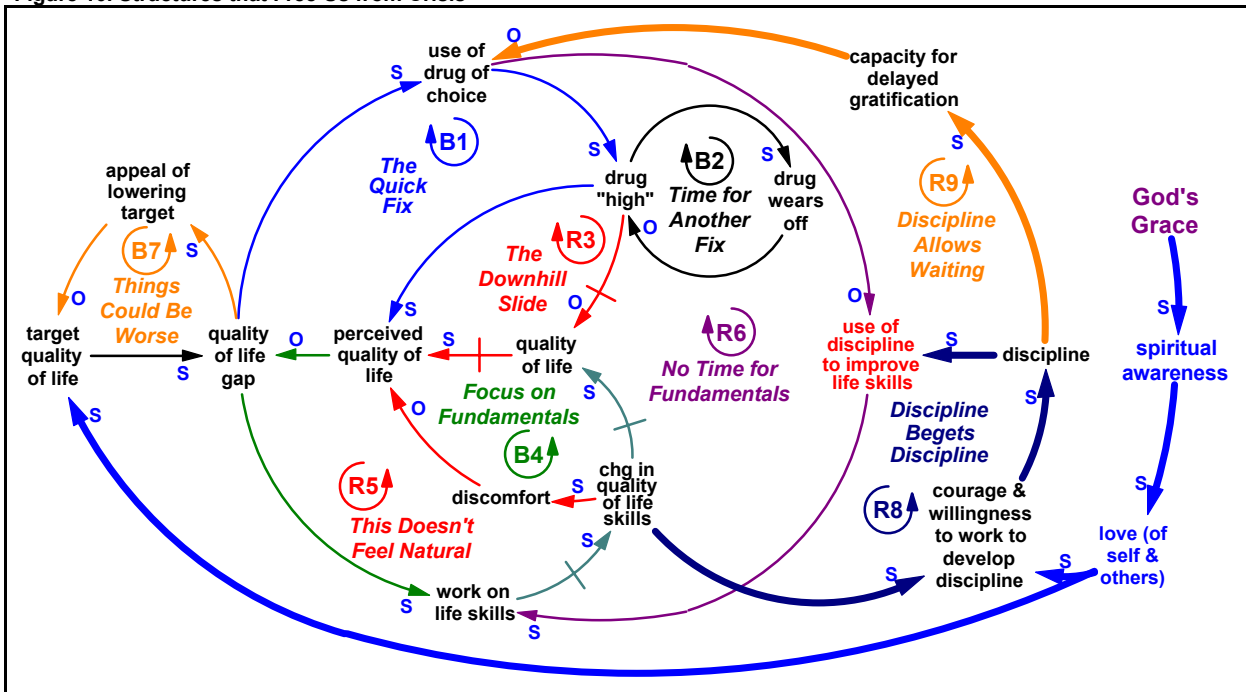courage

Which Are Provided by

Love

cation" to helps reduce our use of drugs. Also, increased "love (of self & others)" raise our "target quality of life." All are beneficial effects.

Scott Peck also says that "love (of self & others)" comes from "spiritual awareness," which in turn is a result of "God's Grace." This is consistent with the experience of the "twelve step program" used by Alcoholics Anonymous.

Is This Relevant to Organizations?

Well, they don't call it the "quick fix" for nothing. It's exactly the same structure. Figure 11 shows the same

Figure 10. Structures that Free Us from Crisis

He says, "The strength, energy and willingness to use [the techniques of discipline] are provided by love…"[13] of self and others. Love also provides the necessary courage. (See also Figure 9.)

The Entire Structure

Figure 10 shows all these causal relationships and how they relate to the structure built so far. If greater "love (of self & others)" gives us "the courage & willingness to work to develop discipline," it gives us increased "discipline" and activates loop **R8**, *Discipline Begets Discipline*. Increased "discipline" increases "work on life skills" to increase "quality of life skills" over time. This in turn gives us more "courage & willingness … ."

R9, *Discipline Allows Waiting* shows that more "discipline" also gives us more "capacity for delayed gratifi-

structure adapted to address an organization's production/distribution system. Perhaps the problem is that it's less efficient and effective than desired.

But the prescription shown for extricating ourselves from the personal addiction structure in Figure 10 is problematic in business. It's not generally acceptable to use four-letter words like "love" (much less that three-letter word, "God").

As an alternative, Stephen Covey's *Principle-Centered Leadership*[14] describes the source of "discipline" as "Values, Purpose and Envisioned Future"; and the source of these is "Principles." It's less objectionable to substitute "Principles" and "strength of Values, Purpose & Envisioned Future" as the source of "courage and willingness to work to develop discipline."

In his book, *Synchronicity*, Joseph Jaworski addresses

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[13] M. Scott Peck, The Road Less Traveled, 1978, p. 77.
[14] Steven Covey, *Principle-Centered Leadership*, 1990

Figure 11. An Application to Organizations
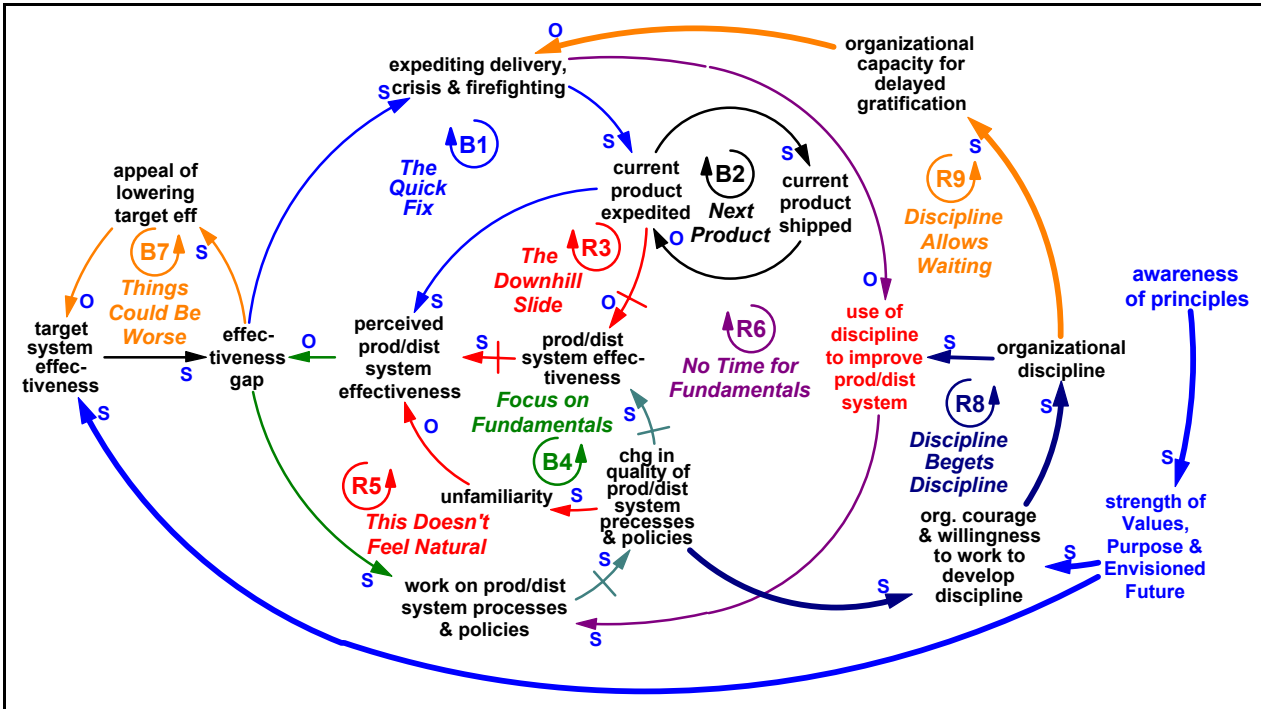
this issue as he writes of his vision of founding the American Leadership Forum.[15]

> After I concluded my remarks that day in Hartford, a member of the group stood up and asked me what the role of God was in all of this. He said I had spoken of servant leadership, alluding to service to mankind and service to something higher. "Where do you stand on this question?" he'd asked.
>
> I gave a weak reply, not really knowing how to handle the delicate subject of God in a secular setting, particularly where I was dealing with senior people in the business world. The day after that encounter, I telephoned John Gardner and told him of my uncertainty about how to respond in this sort of circumstance. John simply said, "over the entrance to Carl Jung's home in Switzerland is a Latin inscription: *Vocatus atque non vocatus, Deus, aderit* — 'Invoked or not invoked, God is present.'"

So, even though a short-term fix for getting product out is to expedite product shipment, there's always another product to expedite … and expediting tends to create other products that need to be expedited. It also tends to gum up the whole production/distribution system and reduce its general health. We'd be better off if we'd work on improving processes and policies.

To actually do this, we need the same kind of discipline, in this case both *organizational and personal discipline*, which are truly derived from the source

shown in Figure 10.

The Process Capability Trap

Figure 12 shows the heart of a structure in a paper by Repenning and Sterman on a barrier to process improvement.[16] Below is a brief description of the dynamic:[17]

B1, *Work Harder*, is a way to balance workload and close the performance gap. Another way to close the gap is **B2**, *Work Smarter*; this takes longer because the flow, "invest in process capability," takes time to fill the stock[18] of "Process Capability."

Figure 13 shows how we get trapped by the interaction between these two loops. Everyone knows it's better to work smarter, but when there's pressure to get work done, there's a choice to be made between "time improving process" and "time working" … and the short-term most often wins … there's only so much time. This means we're more likely to get stuck in **B3**, *Focus on Getting the Work Done*, instead of working on the long-term **R4**, *Reinvest in Process*.

This is especially true since we're prone to make the attribution that people are the problem and apply management pressure and control, loop **B5**, *Crack the Whip*. This *Crack the Whip* pressure leads to making

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15 Joseph Jaworski, *Synchronicity, The Inner Path of Leadership*, 1996, p. 60 & p. 191
16 Repenning & Sterman, "Nobody Ever Gets Credit for Fixing Problems that Never Happened: Creating and Sustaining Process Improvement," 2000, http://web.mit.edu
17 This diagram has been modified to add "perceived performance" and the positive link to it from "untested process changes." Also added is a negative link from "attribution: workers are the problem" to "pressure to improve capability."
18 See Appendix I for and explanation of stocks and flows.

"untested process changes" that initially appear to improve "perceived performance" and reduce the "performance gap." This creates **B6**, *Process Shortcuts*. However, loop **R7**, *Process Integrity* shows that "untested process changes" "erode process capability" to reduce "actual performance." Even later "perceived performance" is lower.

Figure 14 is a revised mapping of this same structure that is more consistent with the mapping Figure 6. To make it easier to see the similarity, Figure 15 omits some of the structure to make the comparison apparent: "actual performance" is the counterpart of "quality of life." The "untested process changes," like drugs, are immediately perceived to have a positive effect, but over time they degrade "Process Integrity" and "actual performance." Loop **B2**, *Work Smarter* in Figure 15 is the counterpart to loop **B4**, *Focus on Fundamentals* in Figure 6.

This remapping shows that a portion of the "Process Capability Trap" structure is a specific example of the general "Crisis Syndrome" structure.

What is not in the "Crisis Syndrome" structure is the "reality-creating" loop formed in Figure 14 by the "outsides" of loops **B5**, *Crack the Whip*, and **R7**, *Process Integrity*. In this larger loop, more "attribution: workers are the problem" causes increased "pressure to get work done" and then more "untested process changes." Over time this reduces "Process Capability" to create more of a "performance gap" and more "attribution: workers are the problem." That's a self-confirming attribution. And an example of the Fundamental Attribution Error: "The attribution of a problem to the characteristics — and character flaws — of individuals in a system, rather than to the system in which they find themselves, is so pervasive that psychologists call it the "fundamental attribution error'"[19]

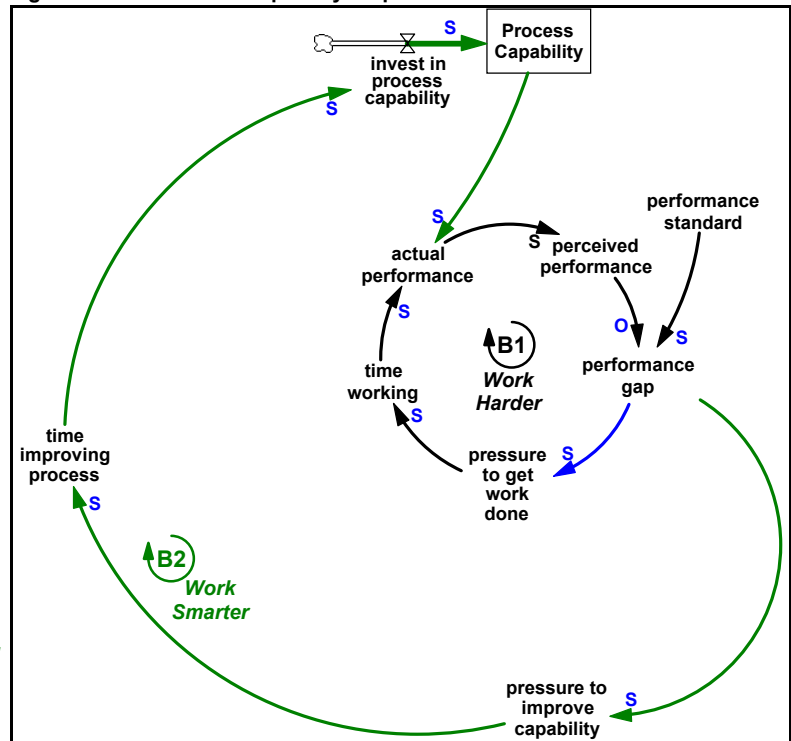Figure 12. The Process Capability Trap - the initial choice

Figure 13. The Process Capability Trap
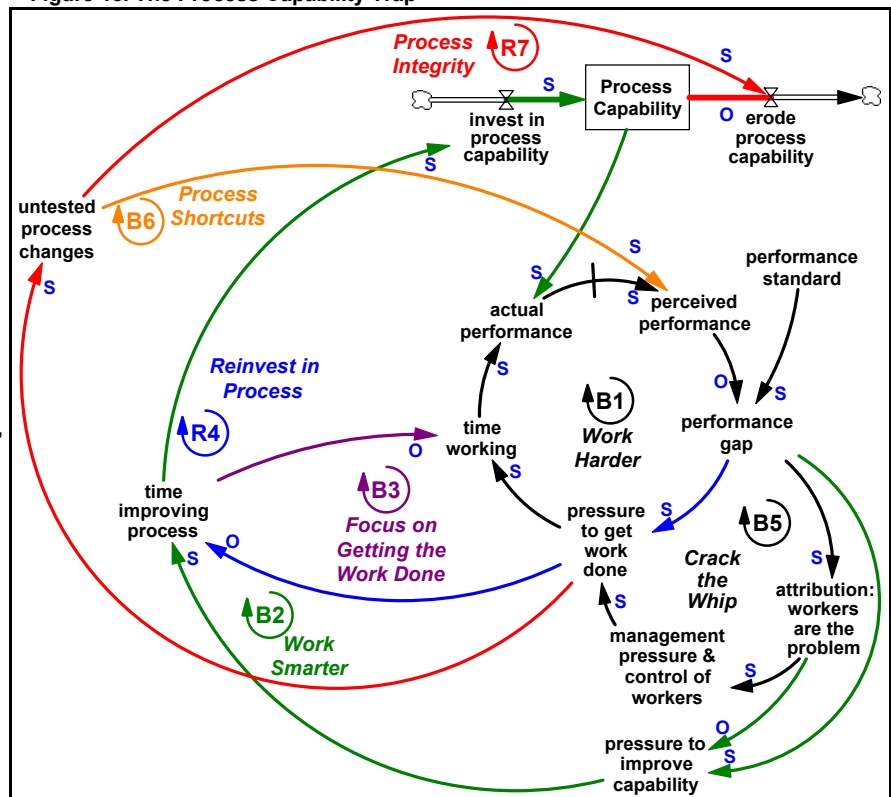
Recovery Approaches

Organizations can select one or more recovery ap-

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19 Repenning & Sterman, "Nobody Ever Gets Credit for Fixing Problems that Never Happened: Creating and Sustaining Process Improvement," 2000, http://web.mit.edu. Note that this same dynamic is present in the related structure in Figure 16, also from Repenning and Sterman. It is discussed in the section below on Transformational Psychology.

proaches to help transition from a short-term to a long-term focus. The problem is the same for organizations as for individuals and the approaches for organizations parallel those used to help individuals escape an addictive cycle. All of these approaches require discipline and caring about the future.

An article on addiction in *Psychology Today* states, "One reason that many people become addicted is that they rarely experience the worst consequences of their behavior soon enough to override the pleasure."[20] This is a perfect statement of one of the problems created by dynamic complexity.

Treat the System

For individuals in addiction, we've learned to move to family therapy, where the family is treated, not just the "identified" person. Similarly, for performance problems in organizations, we must move from optimizing the parts to optimizing the system. This involves weaning the organization from an addiction to blame: moving from "don't blame the person, blame the process," to "don't blame the process, blame the system," to understanding our mental models and assumptions so we can finally move to "don't blame the system … eliminate blame."[21]

Aversion Therapy

We've learned that an effective approach for addicted individuals is to provide immediate negative feedback so they immediately experience "the worst consequences of their behavior." In organizations we can make it standard practice to convene a group immedi-

Figure 14. The Process Capability Trap - remapped

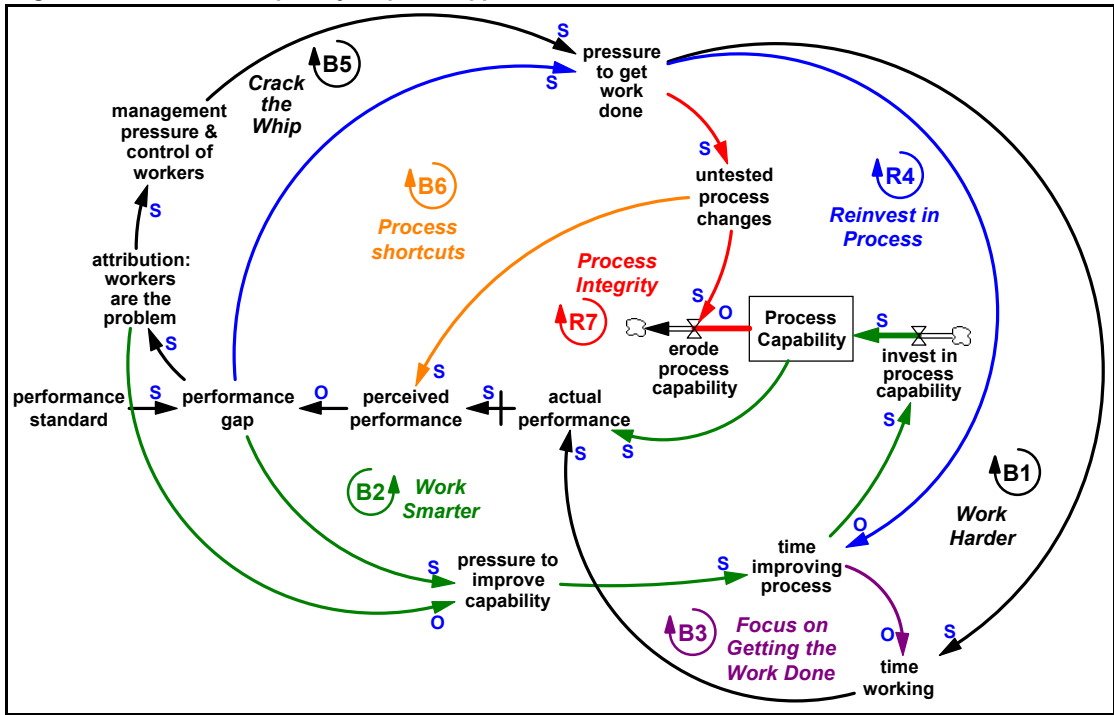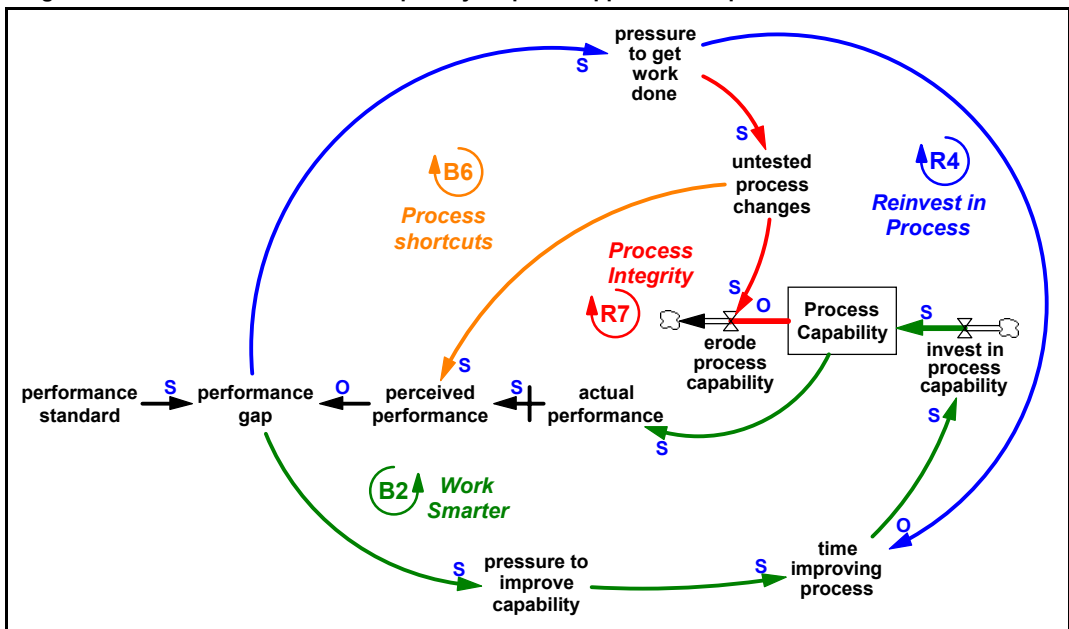**Figure 15. The Core of the Process Capability Trap - remapped and simplified**

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[20] "Addiction, A Whole New View," *Psychology Today*, Oct. 1994
[21] Margie Mulligan, Varian, 5/9/96, Learning-org — An Internet Dialog on Learning Organizations

ately after each firefighting episode to discuss what happened. This doesn't have to be unpleasant if it is done without blame.

The group can determine what might have prevented the fire and also examine the potential negative consequences of the firefighting effort. They can then initiate activities to make the needed changes or include the activities in a list of pending candidate projects.

Behavioral Shaping

For individuals we can change the reward system, in particular increase rewards which encourage abstinence. For organizations we can learn how to measure the *real health of the system* and not depend on feedback from symptoms. With this we can set up rewards for problem prevention and base rewards on measured progression down the half-life curve, comparing progress against expectations estimated from the technical and organizational complexity of the process being improved.[22]

Brief Intervention & Motivational Interviewing

For individuals, it's been found that "… very brief treatment, if designed properly, is highly successful against even moderately severe addictions."[23] In comparisons between a "treatment group," which got counseling & Antabuse, and a "control group," which got a brief self-help manual and was told to go home, read it and do their best, the control group did just as well as the treatment group. To determine why this happened, they then gave one group the manual and another group no manual. They found that "the handing out of the manual" had inadvertently motivated control group despite expectations. "The addicts changed and moderated their drinking. Simply giving them the manual, saying to them that we believed they could help themselves, could handle it, you can do this, was enough."

Motivational interviewing is examining "what's worked in the past" to encourage more of the same.

An approach for individuals and for organizations is to combine "motivational interviewing" and "brief-intervention" therapy.[24] This approach has the following key components, which have the acronym, **FRAMES**:

- **F**eedback - specific and tailored to the individual, not general
- **R**esponsibility - it's up to you, your choice, you are not a helpless victim of a disease
- **A**dvice - firm and clear recommendations
- **M**enu - there are different ways to work this out
- **E**mpathy - the best therapists have empathy, neither pushy nor confrontational, but supportive and warm
- **S**elf-efficacy - "you can do it" … empowerment

Transformational Psychology

Research on abrupt personality change has shown that there are special instances (e.g., Joan of Arc, Malcolm X, AA co-founder Bill Wilson) where some addicts have kicked their habits overnight. "We know that 'relatively sudden and profound changes can and do occur, at least occasionally.' If that capability could be harnessed, the impact on addiction could be profound."[25] Similar results have been observed in organizations, such as abrupt mental model shifts at Harley-Davidson.[26] They learned the new language of causal loop diagrams and had the structure of their system explained in those terms (see Figure 16).[27] Their new mental models improved their understanding and allowed teams to recognize what was happening. A representative comment was, "We're stuck in B1 and B2 (the Remake and Rework loops), instead of using B3 (the Fundamental Improvement loop)."

"Warm turkey"

Tapering down gives addicts a chance to kick their habits. It helps them not give up if they fail. They are taught "relapse prevention" skills for coping with mistakes and setbacks. It allows for moderate continuation of some addictions for some people, rather than insisting on total abstinence.

This may be the best approach in organizations, where an abrupt ban on firefighting might cause excessive pain for the customers and the organization. It's been called "lowering the water" to uncover problems.

An example in manufacturing is to gradually reduce the allowed amount of WIP (work in process) to slowly uncover the problems that interrupt the flow of the production line, that cause people to hoard WIP to protect

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22 See our paper on Exponential Improvement
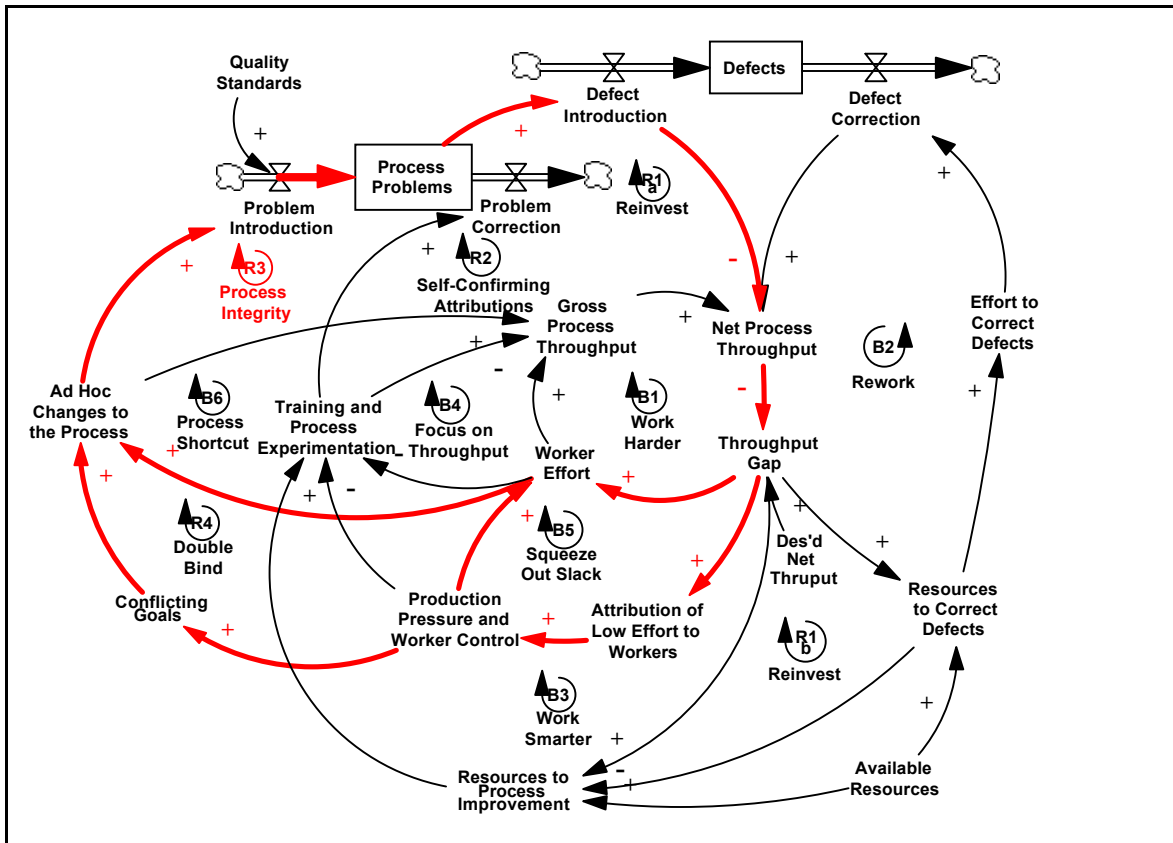23 "Addiction, A Whole New View," *Psychology Today*, Oct. 1994
24 "Addiction, A Whole New View," *Psychology Today*, Oct. 1994, citing the work of William R. Miller, Ph.D., professor of psychology and psychiatry and director of the Center on Alcoholism, Substance Abuse, and Addictions at the University of New Mexico. His work showed that many alcoholics could be taught to drink moderately, with many becoming abstainers. He says, "The old domino theory that 'one drink equals a drunk' proved for some, to be baloney. We know with cigarette smoking and alcohol and other addictive behaviors that moderation, tapering and 'warm' turkey can be very effective."
25 "Addiction, A Whole New View," *Psychology Today*, Oct. 1994
26 Nelson Repenning, MIT Center for Organizational Learning, and Don Kieffer, Harley-Davidson Co., "Strategies for Product Development: Early Lessons at Harley-Davidson," 1997 *Power of Systems Thinking* ™ Conference, 5/14/97, Pegasus Communications, Inc., One Moody Street, Waltham, MA, 02154-5339, 617 398-9700, www.pegasuscom.com.
27 We caption Figure 15, "The Road to Hell," because believing "people are the problem" leads to that being exactly the case, as in their Process Improvement Trap structure. Note the two structures describe much the same dynamics.

Figure 16. The Road to Hell

Quality Standards

Defects

Defect Introduction

Defect Correction

Process Problems

Problem Introduction

Problem Correction

Ra1 Reinvest

R3 Process Integrity

Self-Confirming Attributions

R2

Gross Process Throughput

Net Process Throughput

Effort to Correct Defects

B2 Rework

Ad Hoc Changes to the Process

B6 Process Shortcut

Training and Process Experimentation

B4 Focus on Throughput

Worker Effort

B1 Work Harder

Throughput Gap

R4 Double Bind

B5 Squeeze Out Slack

Des'd Net Thruput

Resources to Correct Defects

Conflicting Goals

Production Pressure and Worker Control

Attribution of Low Effort to Workers

R1b Reinvest

B3 Work Smarter

Resources to Process Improvement

Available Resources

From Nelson P. Repenning and John D. Sterman, "Getting Quality the Old-Fashioned Way: Self-Confirming Attributions in the Dynamics of Process Improvement", 1997. http://web.mit.edu/jsterman/www/.

themselves.

An example in engineering is to gradually and progressively advance design "freeze" dates to allow more up front planning and problem prevention in preparation for the next design. If engineering is allowed to continue delaying design release to "fix" the current design, there will be insufficient work on improving the design process for the next design.

Support Groups

Individuals seek out a support group (e.g., Alcoholics Anonymous). This is one of the most powerful approaches. The group gives people support when they "backslide." The organizational parallel is reflected in the theme of the 1997 *Systems Thinking in Action*™ Conference: "from learning organizations to learning communities." Peter Senge has spoken of the purpose of this transition being to provide continuing, mutual support to companies developing the disciplines of the learning organization.[28]

Visioning

Time to examine envisioned future keeps targets high, leads to setting higher targets, and opposes long term goal erosion.[29]

This is as true for organizations as for individuals. *Built to Last* by Collins and Porras describes increased financial returns achieved by organizations that preserve core Values and Purpose and pursue an inspirational Vision to stimulate progress.[30]

Experimentation & Preparation for Change

Experimentation can encourage individuals and organizations to "just try it" for a while and see if it works. If the trial period is long enough for benefits to appear, that may be enough to reinforce the new practice.

Preparation for change provides forewarning that there will be some discomfort associated with the change ...

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[28] Peter M. Senge, "The Knowledge-Building Process: The Important Role of Learning Communities," The *Power of Systems Thinking*™ Conference, 1997, Boston, MA, video and audio tape available from Pegasus Communications, Inc., One Moody Street, Waltham, MA, 02154-5339, 617 398-9700, www.pegasuscom.com.

[29] See our paper on Service Quality Erosion and the quote from Jay Forrester at the end of the next section.

[30] James C. Collins and Jerry I. Porras, *Built to Last*, 1994. See our paper on Systems Thinking Leadership on how leadership is creating structures that support Values, Purpose and Vision to create the outcomes we desire.

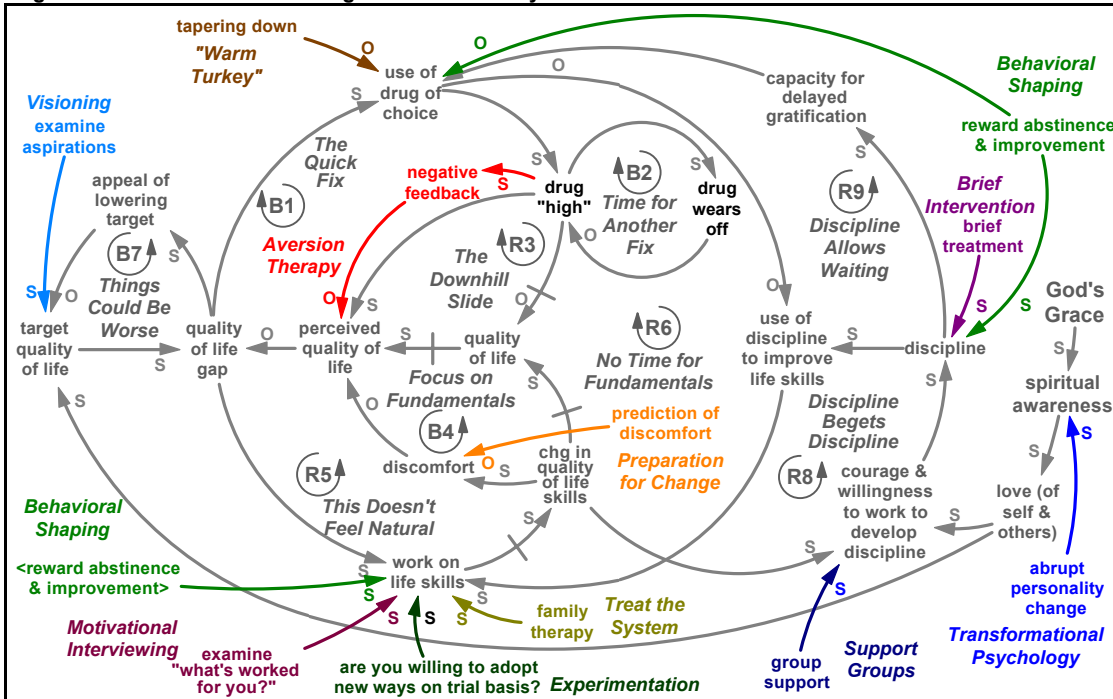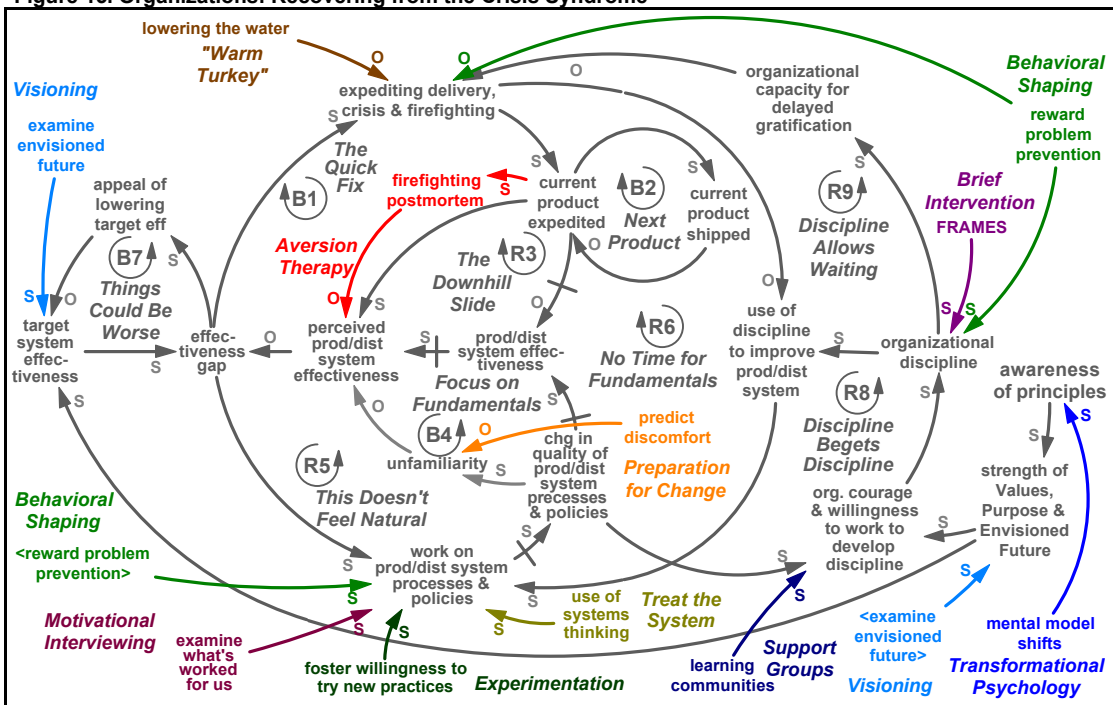**Figure 16. Individuals: Recovering from the Crisis Syndrome**

Figure 15. Organizations: Recovering from the Crisis Syndrome

run.[31] There is cost associated with improvement ... in the short-run, even when there's net long-run benefit. In organizations, for example, even improved processes will initially be unfamiliar and result in mistakes and stress. It's necessary to "stick with it" for a while for full benefits to appear.

How Policies Affect Structure

These recovery approaches influence and change system structure. Figures 17 and 18 show how these recovery approaches affect the structure of the Crisis Syndrome.

Discipline & Organizational Learning

Scott Peck's four basic techniques of discipline echo prescriptions for organizational heath from systems thinking and organizational learning. They're as critical for helping organizations escape the Crisis Syndrome as they are for individuals.

Here are the parallels:

even if the change is positive. That very warning may lessen the pain caused by change.

Experimentation and preparation for change are as useful for organizations as for individuals. This is because when we do the right thing for the long run, we almost always experience negative effects in the short

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31   This is the "worse before better" behavior encountered in systems when addressing root causes rather than symptoms, or when increasing fundamental capabilities rather than relying on an intervenor.

- **delaying gratification** - this allows us to understand and tolerate the worse-before-better behavior in systems when we take action that best serves the long-term. When Scott Peck says, "It is the only decent way to live.," it makes me think, wouldn't it be great if all organizations could do this?
- **assumption of responsibility** - we know from the systems point of view that "system-as-cause" thinking "is vital for establishing a perspective of personal responsibility for performance."[32]
- **dedication to the truth or reality** - our openness to challenge of our mental models is critical for successful dialogue, skillful discussion or modeling & simulation.
- **balancing** - a need for an ability for flexible response is similar to the systems thinking lesson of a need to use both-and, rather than either-or, thinking.

The principle of "assumption of responsibility" is particularly important. It's as important for company success as it is for personal success. Jay Forrester[33] said,

> … success and failure arises primarily from the internal policies and information flows. There is a great tendency when there is some kind of difficulty, problem or failure to blame it on the outside world, to blame it on other people, but I would say that, almost always, the problem arises from the internal structure, the internal policies, even in situations where there's a clear, unambiguous external cause. You look back into the organization and you find that it has policies that made it vulnerable to that situation, rather than making it much more invulnerable. … you find corporations that will go for decades in a certain mode like low profitability or high instability of employment where competitors in the same environment are not experiencing problems of that sort. It clearly has to be something that is internal and continuing in that organization … there are systemic reasons for most of the important things that happen.

The truth is that there will always be crises. The root of the problem is avoiding the pain of undertaking the long-term or fundamental internal solution. Scott Peck says,[34]

> In our pain-avoiding culture, we have a very strange attitude toward mental health. We Americans think that what characterizes the mentally healthy is an absence of crises. What characterizes mental health is the ability to meet our crises early.

Discipline often has a negative connotation, but it has a powerful positive influence. We desperately need discipline, both personally and organizationally. There was good reason for Peter Senge to not call his book, *The Fifth Habit*; it's stated well in this quote from a paper in the *Harvard Business Review*.[35]

> If an organization is to change the way its people think and act and interact, … people must internalize a set of principles or disciplines that shape their reactions and govern behavior. … Habits are automatic and therefore mindless. … Disciplines are mindful.

High weight must be given to maintaining enduring values and purpose to prevent a downward spiral of the health of the system. Jay Forrester wrote,[36]

> As the present is emphasized over the future, the result is long term deterioration and further emphasis on the short run. … Unless some effective institutional mechanism exists for sustaining a vision of the future and subordinating short-term conflicting goals, all social systems are subject to the erosion of long-term goals.

We can pull out of, or better yet prevent, this downward spiral. Understanding the structure of the Crisis Syndrome can help give us the faith that taking a fundamental or long-term approach will be effective. We know we must understand and deal with "perception delay," the delay we experience before we perceive the result of an action.

We also need the courage to deal with the larger issue of what might be called a "faith delay,"[37] the delay we experience between having an idea and perceiving the results of action based on that idea. This is about having the faith that our actions for the long term will bear fruit, even though it will take time to see.

Farmers plant seeds with faith that crops will result. For organizational improvement we need to have at least as much faith as farmers.

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[32] Barry Richmond, "System-as-Cause Thinking," *Systems Thinker*, October 1997
[33] Jay Forrester, Power of Systems Thinking Conference, May 1995, Boston, MA
[34] M. Scott Peck, Further Along the Road Less Traveled, 1993, p. 147
[35] Pascale, Millemann & Gioja, "Changing the Way We Change," Harvard Business Review, Nov/Dec 1997
[36] Jay W. Forrester, "Churches at the Transition Between Growth and World Equilibrium," *Collected Papers of Jay W. Forrester*, 1975, p. 261 (paper presented at annual meeting of the Program Board of the Div. of Overseas Ministries of Nat'l Council of Churches, 11/4/71).
[37] The "faith delay" would include the "perception delay."

Appendix I. A brief introduction to systems diagrams

Why systems thinking is important

Societies, organizations, and persons are systems. The essence of the systems approach is to understand the "structure" of the system by understanding the relationships and interactions between its parts.

The premise, a key principle of system dynamics, is that *the behavior of the system is determined primarily by its internal structure, not by external influences*. It's not that external influences do not affect system behavior, it's that first we look for how the system itself may be creating (or will create) behavior. When an external influence is considered, the premise is that the system's response to that external influence is determined by its internal structure, not by the external influence. "Structure" is used in a very specific way in this context; it consists of the influences of system variable on each other. For example, all else being equal, increasing "travel time" decreases the "attractiveness of driving."

Because everything is connected to everything else, we can't simply "map or model the system." Determining the boundary of the system is a major, but necessary, challenge. We establish a system boundary by defining the problem to be addressed, not the system to be understood.

The language of causal loops

- An "S" means an influence in the "Same" direction, e.g., more "births" give more "population," or fewer "births" give less "population" (than there otherwise would have been).
- An "O" means an influence in the "Opposite" direction, e.g., more "deaths" gives less "population" … or fewer "deaths" gives more "population" (than there otherwise would have been).
- Loops are reinforcing if there are an even number of "O" links (zero being an even number). The action of a Reinforcing Loop is to increase or decrease the amplitude of the behaviors associated with the loop.
- Loops are balancing if there are an odd number of "O" links. The action of a Balancing Loop is goal seeking, to decrease the variations in behaviors associated with the loop (though large oscillations can result if there are long delays).
- A slash across a link indicates that it has a significantly longer time delay than the other links.

How to read Causal Loop Diagrams

Though some diagrams are complex, they are relatively simple to read. The loops are essentially stories; follow the arrow links to read them. As an example, at right is a diagram that goes with a saying; read it like this:

- *More* "customer traffic" creates a *longer* "length of line."
- A *longer* "length of line" creates *more* "wait time."
- *More* "wait time" results in *lower* "service quality" and, after some delay, *lower* "perceived service quality." It takes us time to perceive that the service quality is lower. Note "wait time," compared to "expected wait time," determines "service quality." The *greater* the "expected wait time," the *better* the "service quality."]
- After some delay, that is, after this happens one or more times to some people, *less* "perceived service quality" creates *less* "customer traffic."

In this case we started with *more* "customer traffic" and completed the loop with *less* "customer traffic." The diagram's "story" can also be told in the opposite sense, starting with *less* "customer traffic," etc., and ending with *more* "customer traffic."

This is an example of a "goal-seeking" balancing loop, where going entirely around the loop creates an influence that counteracts the initial change. A balancing loop's action is similar to that of a home heating system with a thermostat; in this case "expected wait time" is the thermostat setting. A thermostat-like reference is present for all balancing loops, either explicitly or implicitly. This diagram shows that "customer traffic" increases until "wait time" equals the "expected wait time." If "wait time" increases above the "expected wait time," the influence will cause "customer traffic" to fall back to a level where "wait time" equals "expected wait time" … or perhaps oscillate about that level.

In the case of a reinforcing loop, going around the entire loop produces an action in the direction of the original action … it re-

What is systems thinking?
Seeking to understand system behavior by examining "the whole" … instead of by analyzing the parts.
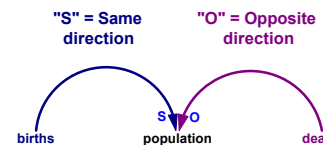
What is structure?
The influences and interdependencies among actions and measures, including feedbacks, that determine system behavior.

What is feedback?
In this context, it is not "constructive criticism." It's when changes in one part of the system affect other parts of the system, which in turn affect the original part.
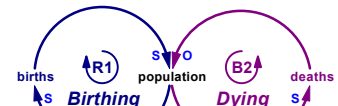
Links and Loops

"That place is too popular. Nobody goes there anymore."
Yogi Berra
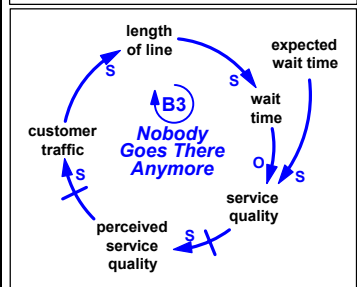
inforces to produce an increasing or decreasing response (an increasing feedback example is the squeal of sound system feedback). Reinforcing loops are two-edged swords; they can be either virtuous or vicious cycles.

## How to Read Stock and Flow (S&F) Diagrams

A S&F diagram distinguishes between stocks and flows; it shows the flows into and out of the stocks. A stock is represented by a rectangle and flows are indicated by valve-like structures. In the example at right, the "Net Revenue" is the difference between "revenue" and "cost."

A stock is the accumulation of the flows over time. Mathematically, a stock is the integral of the flows over time. This sounds complicated, but it is our common experience. The water in a lake is the accumulation over time of the water flow into the lake minus the water flow out of the lake (nature integrates).

The links between the valves and arrows have the polarity indicated. Note that, though the S&F "cost" flow arrow goes _out_ of the "net revenue" stock (showing that cost is an outflow), the *influence* of the cost variable is _on_ "net revenue" and the influence is negative.

As shown in the causal loop diagram of the same structure, the arrow goes from "cost to net revenue." Note that the typical causal loop diagram does not distinguish between stocks and flows.

It's good to remember though that in a simulation model, whether a flow is actually in or out of a stock is determined by the equations governing the flow, not the direction of the arrows.

A Stock and Flow Diagram

A Causal Loop Diagram
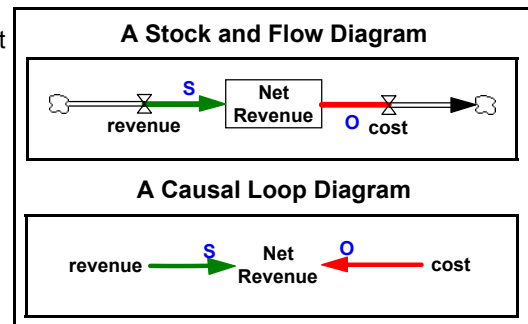
Why do loops matter?

Loops matter because nothing grows without a reinforcing process … and
nothing grows forever, because limiting actions of some kind always arise. These loops are structure. As noted above, though there are outside forces that act on the system, the response of the system to those external influences is determined by the structure of the system. Unless we understand the reinforcing and balancing feedbacks, the drivers of behavior, we cannot design policies to produce the behaviors we desire.

The diagrams form a "theory of the system." Theory is not just academic; it is very practical. The word "theory" comes from the same root as the word "theater" … both are ways of displaying our thinking. Systems thinking is an especially useful lens through which to gain insight; and it creates a framework for productive dialogue. Talking about the issues in the context of the diagrams can be very powerful. Beyond that, it is productive to create a system dynamics model, gather data to populate the model, then engage in simulation, testing, and dialogue … and iterate and iterate and .…

Questions to ask about models:

- Does the structure have the potential to create the behavior observed?
- Is there disagreement about the influences in the model? If so, the disagreement is an opportunity for learning. Often models can be altered to display the alternate competing effects … with *both/and* thinking, rather than *either/or* thinking. In other cases, disagreement can point to data that's needed to resolve the dispute.
- What measures are we missing that are needed to track what's happening? There's so much data than could be taken, we need theory to guide us in selecting the data to collect … the data that will be most useful in confirming or disconfirming theory.[38]
- Are there latent potential feedbacks that are not yet activated? They could affect the future behavior of the system.[39]

Models are always incorrect. They are only approximations, not the real thing. So they're not about their absolute correctness, but about their usefulness for as a foundation for dialogue and understanding the root of system behavior with respect to the problem being addressed.

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[38] Every measurement is guided by some explicit or implicit theory that tells us that the measure is important. Unfortunately, we often manage based on the measures we happen to have, rather than the measures that are important.

[39] This points to a difficult aspect of modeling. Just because a model predicts the past does not mean it can tell us what will happen in the future. Dormant loops often become active and produce what we perceive as "surprising behavior." For this reason, using spreadsheets of past performance and projecting into the future with regression formulas is like driving while looking through the rear view mirror. This is a major weakness of econometrics.