



Continuous Improvement Associates

From Causal Loops to Action

Causal Loops Look Too Theoretical?

They are theory, but they're practical, too!
Here's how to use them.

Systems Thinking:
It's more than you think.SM

They don't look all that useful

Let's admit it up front, systems thinking causal loop diagrams and system dynamics stock & flow diagrams represent "theories" of the system. They don't look too practical. And we don't have all that much respect for theory. After all, when we're in a hurry, someone will say, "That's too theoretical. Let's get practical. Let's just get on with it." Indeed, such impatience can be justified. Many organizations have created complex diagrams, but they haven't known what to do with them. That is, how to use them as a basis for action. This is how.

Theory and measurement

So much to measure, so little time. We can't measure everything, so we must choose. To guide the choosing, we need theory. Without it, we don't know how to put the data of our experience in order. There's nothing so practical as a good theory.

A real example

As a context for illustrating how to go from causal loops to action, we'll use the "short pay" mechanism that Jim Collins described in the *Harvard Business Review*.* The mechanism is: A company includes on each invoice the following statement: "If you are not satisfied for any reason, don't pay us for it. Simply scratch out the line item, write a brief note about the problem, and return a copy of this invoice along with your check for the balance."

What is systems thinking?

Seeking to understand system behavior by examining "the whole" ... instead of by analyzing the parts.

Drastic, yes, but it forces a company to face problems with its product or service head on. The revenue loss forces attention on how to prevent future problems ... a long term focus..

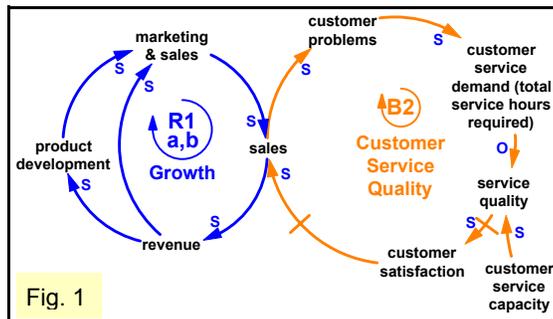


Fig. 1

The problem the company must overcome to continue growing (R1) is to improve customer satisfaction (B2).

The "short pay" structure

Figure 1 shows the stories associated with the familiar "Limits to Growth" structure.
R1: Growth. Sales grow or decline based on the effectiveness of product development, marketing, sales and revenue from sales.
B2: Customer Service Quality. As sales grow, customers report more problems, service quality declines (for constant customer service capacity), and sales decline. [The slashes on two of these links indicate longer delays.]

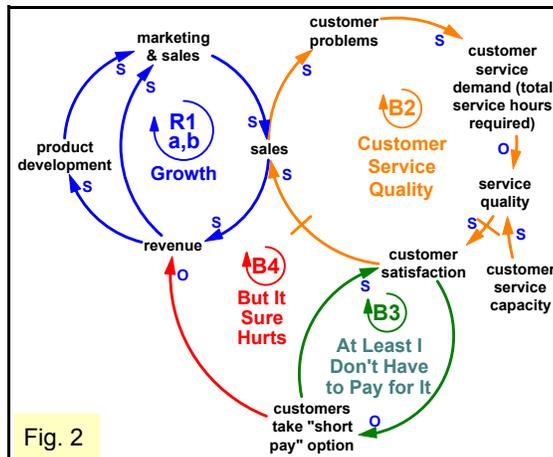


Fig. 2

To improve customer satisfaction and promote learning how to continually improve, allow customers to not pay if they're not satisfied (B3). It hurts revenue (B4), but ...

Short-term & long-term effects

Figure 2 shows a preliminary extension of the structure to look at the "short pay" policy.
B3: At Least I Don't Have to Pay for It. The use of "short pay" gives some immediate increase in customer satisfaction, because at least they don't have to pay for products or services with which they are unhappy.
B4: But It Sure Hurts. There's an immediate negative impact on revenue when customers take the "short pay" option.

These short-term effects set the stage for long-term improvement. This is typical of the "worse before better" behavior observed when

we take action to benefit long-term health, rather than action to relieve symptoms (to "feel better fast"). The policy provides incentives for long-term improvement.

"No theory, no learning."
W. Edwards Deming

Figure 3 adds the long-term effects.

* Jim Collins, "Turning Goals into Results: The Power of Catalytic Mechanisms," *HBR*, Jul-Aug 1999

B5: Fewer Problems in the Future. In the long term a decrease in “customer satisfaction” is counteracted by the learning associated with finding the root cause of problems and reducing the number of problems.

B6: More Efficient in the Future. If the learning associated with investigating problems is conveyed to customer service personnel, then the time to address customer problems can also be reduced.

Fostering long-term focus

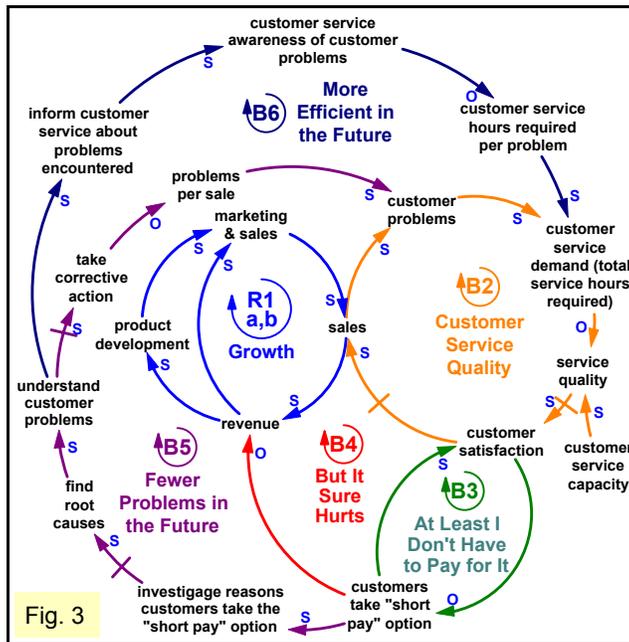
These last two loops provide the incentive for long-term improvement. The “short pay” policy accepts short-term pain for long-term improvement. Often we do the opposite. We get short-term relief, but pay a long-term price.

Connecting the silos

Figure 4 shows different organizations involved at different parts of the loops. We tend to organize functionally, but success depends on fostering favorable operation of the loops. No wonder we have difficulty managing them.

From loops to action

So finally we’re prepared to show how to use causal loop diagrams to move to coordinated action. To do this use the strategy matrix in Figure 5. This approach is adapted from an HBR paper by Clayton Christensen.** We extend his approach to take into account feedback loops (which we can consider internal drivers) as well as driving forces (external drivers).



... it's real incentive for everyone in the organization to find the root causes. This reduces future problems (B5) and it takes less time to resolve similar problems (B6).

“The single most important point ... is the critical importance of creating tangible mechanisms aligned to preserve the core and stimulate progress.” Collins & Porras, *Built to Last*
Better yet, causal loops are *organic processes* that do exactly that.

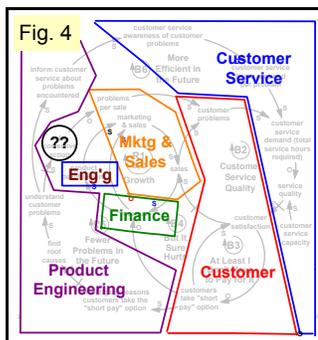
Each group or individual defines their strategy for improving the operation of each loop. Also each defines a summary strategy for all loops. “Loop leaders” can summarize how all groups will foster each loop.

More specifically, we have a well-defined project when all groups and individuals define “who’s going to do what, by when, with what level of quality” for each box in the matrix. This engages everyone in improving system performance.

Conclusion

Systems diagrams provide a shared understanding of how everyone’s actions promote success. Teams learn when they create them and they provide an integrating framework for action.

[For more on fostering action for the long-term, see our papers on Exponential Improvement, Create Strategic Focus, and The Crisis Syndrome series.]



If loop spans functions, it shows who should work with whom ...

Fig. 5	Key Success Loops & Driving Forces						Summary of Strategy for each Function
	Loop B2	Loop B4	Loop B5	Loop B6	Driving Force F1	Driving Force F2	
Organization or Individual	Customer Service Quality	Short Pay Effect on Revenue	Short Pay Effect on Customer Satisfaction	Short Pay Effect on Customer Service Efficiency			
Mktg & Sales							
Finance							
Customer Service							
Product Eng'g							
Other							
Summary of Strategy for Each Loop or Driving Force							

... and when they do, to define strategies and action plans to improve loop operation, it sets the stage for major improvement.

Feedback is Power - Tap It

Feedback loops matter. They matter because nothing grows without a reinforcing process. And nothing grows forever ... limiting actions of some kind always arise. These loops are structure. While there are outside forces that act on the system, the response of the system to those external influences is determined by the internal structure of the system itself.

Unless we understand the reinforcing and balancing feedbacks, the drivers of behavior, we cannot design policies to produce the outcomes we desire.

Workshop Note

Systems diagrams can initially appear complicated. And many of them are complicated. But when a team gets used to the language (it doesn't take long) and develops them in creative group processes, it externalizes understanding and results in valuable group learning.

Management teams think at a higher level and, from the explicit and shared understanding they develop, they move to coordinated action.

The Importance of Causal Structure

“The moral is simple: one cannot specify what information is required for decision making until an explanatory model of a decision process and the system involved has been constructed and tested. Information systems and subsystems are control systems. They cannot be designed adequately without taking control into account.”

Russell Ackoff, “Management Misinformation Systems” *Management Science* 14, #4, 12/67

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** Clayton Christensen, “Making Strategy: Learning by Doing,” *Harvard Business Review*, Nov/Dec 1997