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# Using Performance Measurement to Improve Results: A Life-System Perspective

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## EXECUTIVE SUMMARY

- Few people recognize that using quantitative targets to direct action is appropriate only for machines, not living systems like businesses.
- A living system is not a machine. Treating it as if it were causes harm to the system's long-term performance and ultimately threatens its survival.
- Driving a system by means of external targets and measures may produce desirable results for a while, but eventually it destroys the system.
- The message of this article is *not* to stop measuring, but to stop using measurements to drive actions and outcomes in human organizations.
- Management's job should be to cultivate and nurture patterns that can be observed in life systems.

**“U**sing performance measurement to improve results” is a headline one often sees in articles and seminar programs about cost management. The idea of managing business results by targets defined by quantitative measures is not new, but it seems more popular today than ever before. Indeed, the idea has spread far beyond the business world. Lately it has become a rallying cry even among some environmentalists, who believe that having measurement targets will promote the actions needed to sustain the ecosystem that supports life on Earth (Johnson, 1998).

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## MANAGING SYSTEMS WITH PERFORMANCE MEASURES

Today's enthusiasm for managing systems with performance measures is reinforced by the perception that managing by results has been eminently successful in the business world in the 1990s. This perception is understandable. Corporate profits and stock prices have never risen so rapidly and so steadily as they have in this decade, and the end seems nowhere in sight.

Moreover, business reporters and management gurus usually place these glowing results in the context of stories about executives who use quantitative measures to achieve performance targets through layoffs, new incentive-based compensation schemes, new balanced scorecard tools, new activity-based management programs, and so forth. These stories generally trace successful performance to having quantitative measurement systems that can focus actions precisely on desired results, like having the measurement instruments that guide a ship's antiaircraft guns to a moving target.

### Managing by Results

Almost no one who writes about performance measurement recognizes that managing by results—using quantitative targets to direct action—is appropriate only when you deal with a machine, never with a living system. Using quantitative measures to direct the actions of people in a business organization is legitimate only if we assume a business is a machine. And that is exactly how most executives, business journalists, and management gurus perceive a business today. They assume a business is a mechanistic system whose members, like the parts of a finely tuned machine, perform only in response to external pressures and outside instructions. In other words, a business has no mind of its own.

If an organization were perceived as a life system with a mind of its own, it would be obvious to most people that driving the system's actions with external directions can produce desired results only for a while. Eventually, and inevitably, managing by results destroys the system (Johnson, 1995). Thus, enslaving humans to produce desired output worked for a while in past societies such as ancient Athens and Rome and the antebellum American South. Eventually, however, adverse feedback from the slave system contributed to the downfall of those societies. Similarly, dolphins and killer whales raised in the captive surroundings of a theme park can be taught to perform myriad fascinating tricks not seen in nature, but they live less than half the life span of their species in the wild. Somehow, treating a living system as a machine diminishes that system's long-term performance and threatens its survival.

### Businesses as Life Systems

This caveat applies to any business that is managed according to mechanistic principles, because a business is as much a life system as any other form of life that has evolved on Earth over the past 4 billion years. In large part, life on Earth evolved through a process

of recurrent interactions that give rise to symbiogenesis and structural coupling. In symbiogenesis, living organisms interact with each other in a recurrent, repeating manner that gives rise to a new structure which contains the constituent organisms with their original forms intact. But the new structure, while conserving each individual organism's features, becomes an organism with its own qualities that exceed a simple summation of the combining organisms' individual qualities. For example, photosynthesizing organelles combined with simple bacteria to form the plant cell—arguably the most efficient production system on Earth and certainly much more efficient than any of its constituent organisms. Much later, multicellular species evolved into complex organisms such as human beings. As contemporary biologist Lynn Margulis has said, the human being is little more than a symbiotic community of microbes. But what a community!

### Structural Couplings

Two other modern biologists, Humberto Maturana and Francisco Varela believe that when an organism's development entails recurrent interactions with another organism, a "new phenomenological domain" can arise that is enduring and more complex than, but not destructive of, the interacting organisms that generated it. Particularly interesting to Maturana and Varela are the "structural couplings" that arise from recurrent interactions of organisms that possess nervous systems, especially mammals. Thus, humans interacting recurrently through the medium of language give rise to social couplings such as families, clans, tribes, and other forms of organization such as businesses. I argue that those social couplings—such as business organizations—manifest the properties of life systems just as surely as do the other living systems in the evolutionary hierarchy from which those couplings emerge, such as cells, multicellular organisms, and the metacellular human organism itself.

When we discuss businesses as life systems, it is important to recognize an important distinction that Maturana and Varela draw between organisms and human societies (Maturana and Varela, 1992). The distinction hinges on the different degree of autonomy in their components. In organisms, such as an individual animal, one sees systems of components that have little or no autonomy. Of paramount concern to the organism is to "conserve its adaptation"—in other words, to maintain stability in the unique properties that define its place in the environment. An evolutionary consequence of that concern, revealed in part by the presence of organic processes that can eliminate abnormal cells, is that an organism over time selects components for their behavioral stability.

### Self-Conscious Observers

In human societies, however, the components are humans who interact recurrently through self-conscious communication by language—a capacity that exists in no other life form on Earth. Because

the components of the human social system are self-conscious observers, not stable objects, the existence of the social system therefore requires, and depends upon, the behavioral plasticity of its components, not upon their behavioral stability. In Maturana and Varela's words, "the organism restricts the individual creativity of its component[s], as these [components] exist for that organism. The human social system amplifies the individual creativity of its components, as that system exists for these components." (Maturana and Varela, 1992)

#### EXTERNAL TARGETS

Maturana and Varela go on to state that human communities which "embody enforced mechanisms of stabilization in [the behavior] of their members, constitute impaired human social systems: they have lost their vigor and have depersonalized their components. . . ." (Maturana and Varela, 1992) An example of such impairment, I would argue, is a business that drives the actions of its members with external targets and information designed to enforce goals defined by someone outside the members' community, such as share price goals defined by mutual fund managers. Such "managing by results," while appropriate in a machine or perhaps even in an organism, inevitably generates adverse feedback in a human social system that eventually causes the system to chronically underperform, at best, or totally collapse, at worst.

Obviously, a human social system driven by outside goals can achieve extraordinary performance for brief periods. But continually suppressing the creativity of its components in the interests of "system stability" ultimately cripples the human social system by destroying its unique learning capacity. In other words, managing by results impairs the human social system's ability to capitalize on the "behavioral plasticity" that is embodied in the remarkable nervous systems of its components. That impairment is the price businesses pay when they insist on "using performance measurements to improve results."

#### MECHANISTIC THINKING

In most businesses today, the idea of using performance measurement to influence results reflects the mechanistic thinking that has guided almost all scientific effort over the past 400 years. Basically, a mechanistic system is any system whose operation can be explained with quantitative measurement. That means any system in which relations among parts can be reduced entirely to quantitative terms. In such a system, the performance of the whole is nothing more than the sum of the performance in each of the parts. Moreover, the parts and the whole are assumed to be independent objects that interact only in response to external force. Such systems are characterized by strict independence and lineal cause-effect relationships. Thus, to change output you simply change input in the desired amount and direction.

Another way to characterize a mechanistic system is to say that managing it does not require one to distinguish between means and ends. Changing the ends, or performance results, simply entails moving the parts—the means—in whatever amount and direction you desire the ends to move. It's all one and the same thing. It doesn't matter how you move the parts—whip the slaves if necessary—just be sure to move them in the right direction and amount to achieve the desired results. That pretty much defines current management thinking underlying such practices as using performance incentives to achieve profit targets, laying people off to achieve cost targets, outsourcing to cut costs, merging companies to eliminate resource redundancies, and so forth. The idea is just to move enough pieces—any pieces, it doesn't matter which ones—to reach someone's idea of what costs or profits should be.

### **LINKING ENDS AND MEANS**

Such thinking does not work in the long run, however, if one is dealing with a life system. In life systems, the ends and means are not easily linked, if at all. Indeed, the hallmark of a life system is that everything is related to everything else in a great cybernetic web of interdependent and recursive connections. In such a web, one observes mutual causality, not lineal cause-and-effect relationships. With radical interdependence and mutual causality, the unique properties of a life system are not defined by the system's parts. Rather, what makes the system unique is defined by relationships among the parts, and the patterns shaping those relationships, not by the qualities of the individual parts themselves. Consider what it means to think of yourself as nothing more than the collection of cells that are all part of your body. Obviously there is something more to "you," and that something arises from invisible relationships among those parts. Such relationships are what life is about. They distinguish a life system from a machine.

### **RELATIONSHIPS NOT MEASURABLE**

But therein lies the heart of the dilemma concerning the use of measurement to guide the affairs of a life system such as a business system. Relationships can't be measured. They can't be reduced to the single dimension of quantity. Instead, relationships can be discussed only in terms of patterns shaping them, and only by telling stories about those patterns.

In a life system, reality is not defined by objects that we measure; rather, it is defined by unmeasurable relationships that give rise to the systemic properties that we find interesting, including business results. Gregory Bateson once expressed this idea by saying that Nature probably never ordered up five fingers for primates and humans. Instead, Nature probably posited four paired relationships and left it to the process of evolution to come up with five fingers. Who knows how many alternative "results" there might have been, depending on circumstances and context?

The point is, having someone force results without considering all the relationships at stake is likely to generate highly imperfect or unsustainable outcomes in the type of stochastic and cybernetic system that one observes in Earth's evolving life system.

Keep in mind that I have *not* said to stop measuring. The message here is to stop using measurements to drive actions and outcomes in human organizations. Certainly, measurement can be used to describe a state or a condition of any system, whether mechanical or living. In a life system, however, measurement must not be used to direct actions aimed at changing a state or condition. Actions that shape a life system's emergent properties—including quantitative results—must emanate from an understanding of the relationships and patterns connecting the system's parts. Management's job, then, is to cultivate and nurture patterns that shape relationships according to those patterns one observes in life systems.

Emulate life's patterns and results congruent with systemic health and long-term survival will naturally occur. I think this is what Dr. W. Edwards Deming meant when he used to say that 97 percent of what matters in a business can't be measured (Deming, 1994; Baker, 1994). One wonders what inconsequential matters managers are tending to who spend all their time imagining they "fly the company" with "instrument panels" full of performance measures. And what immeasurable damage is being caused by their earnestly attending only to what can be measured. ♦

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