The Deming Philosophy: New Ways to Think about the World

Michael D. Tveite

INTRODUCTION

W. Edwards Deming died in 1993, and he has long ceased being a household name (if he ever was). Companies are on to the next program and the program after that. I hesitate to even mention the name of any program or fad because it will probably be gone by the time you read this paper. Even though Deming isn't fashionable any more, his ideas are as relevant as they ever were.

People often misunderstood Deming's teachings when he was still alive; they wanted a list of things to do, and were frustrated because Deming wasn't specific enough for them, or they would try to do what they heard him say and it wouldn't work out well. That is primarily because Deming was not trying to teach a different way to **do** so much as he was trying to teach a different way to **think**.

This paper discusses a theory of behavior, provides a brief introduction to Dr. Deming's system of profound knowledge, and contrasts how a system of profound knowledge provides ways of thinking about the world which are often at odds with what is generally accepted as truth in the United States today.

A MODEL OF ORGANIZATIONAL BEHAVIOR

Based on observing organizations, I have developed a basic model of organizational behavior; it is illustrated in Figure 1. The model proposes that behavior is driven by policies, procedures, systems and structures (PPSS). This doesn't explain behavior of every individual in an organization, but I think it does describe behavior of organizations as entities. In turn, the PPSS are created consistent with the fundamental assumptions of the people who created and own them. (I don't claim this model is original or unique; in fact, as I have used it for the past fifteen years I have seen several similar models. I developed this model based on my experiences or observations, so I don't cite anyone else's work although I'm sure models very like this one were around long before mine.)

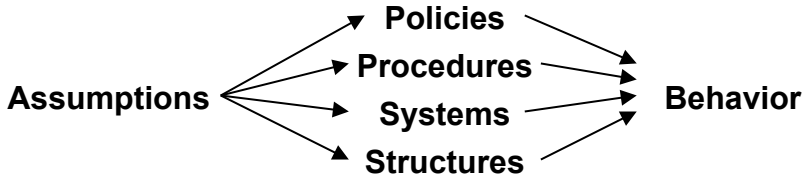

Figure 1. A model of organizational behavior

What does this model of behavior have to do with Deming's ideas? A lot! The PPSS remain visible while the assumptions lie beneath the surface, where they aren't often articulated and are sometimes forgotten. Deming often talked about changing PPSS in ways that were rejected by many in his audiences without even considering why he recommended the changes. For example, Deming often talked about eliminating performance appraisals and merit pay. I often watched managers get very angry at this suggestion and write Deming off as crazy, and they wouldn't even stop to examine the assumptions that led to his statements, or the negative consequences of performance appraisal that were clear to him but invisible to them.

The model of behavior shown in Figure 1 is not intended as a discussion on how to impact behavior change. I realize there are arguments about whether we should strive to change people's assumptions

and behavior will follow or whether we need to change behavior to cause reassessment of assumption. I don't want to get involved in those conversations; instead, this model is intended to describe some dynamics that shape current behavior and need to be considered as change is contemplated. I also propose that behavior change cannot persist unless policies, procedures, systems, structures and, ultimately, assumptions change to support the new behaviors.

INTRODUCTION TO A SYSTEM OF PROFOUND KNOWLEDGE

Deming (1993, page 96) introduces his system of profound knowledge as follows:

> The layout of profound knowledge appears here in four parts, all related to each other:
> - Appreciation for a system
> - Knowledge about variation
> - Theory of knowledge
> - Psychology
>
> One need not be eminent in any part of profound knowledge in order to understand it and to apply it.

One way to think about a system of profound knowledge is that it provides insights into Deming's underlying assumptions, from which he judged policies, procedures, systems and structures. Backaitis (1991) presents the metaphor of a system of profound knowledge as a lens through which to gain insights about the world, which leads to new ways to think about the world.

WAYS TO THINK ABOUT THE WORLD

Rather than attempting to define or describe each of the elements of a system of profound knowledge in detail here, I will attempt to look through the lens of a system of profound knowledge and provide examples that illustrate how a system of profound knowledge causes us to think differently about the world. Specifically, I will address some issues fundamental to thinking about organizations differently.

Views of Organizations

The hierarchical view. Many organizations see themselves primarily as a hierarchy. This implies several things:

- The organization is oriented to the hierarchy. Communication is focused vertically and the person you most need to please is your boss. In this environment, focus on the customers of your work and the consumers of the organization is not reinforced.
- Goals and objectives are set for each department (or other organizational unit). This entails the implicit assumption that departments are independent of each other, and that the result of the entire organization will be the sum of the results of the parts. It is difficult to keep the aim of the entire organization in sight.
- These organizations tend to have detailed job descriptions. There is focus on "what" one does, and "need to know" is a phrase commonly used in these organizations.

The systems view. Dr. Deming (1993, page 58) proposed a flow diagram as a picture of an organization. It is represented here as Figure 2. Deming states

> The flow diagram shown in (Figure 2) was the spark that in 1950 and onward turned Japan around. It displayed to top management and to engineers a system of production. The Japanese had knowledge, great knowledge, but it was in bits and pieces, uncoordinated. This flow diagram directed their knowledge and efforts into a system of production, geared to the market--namely, prediction of needs of customers.

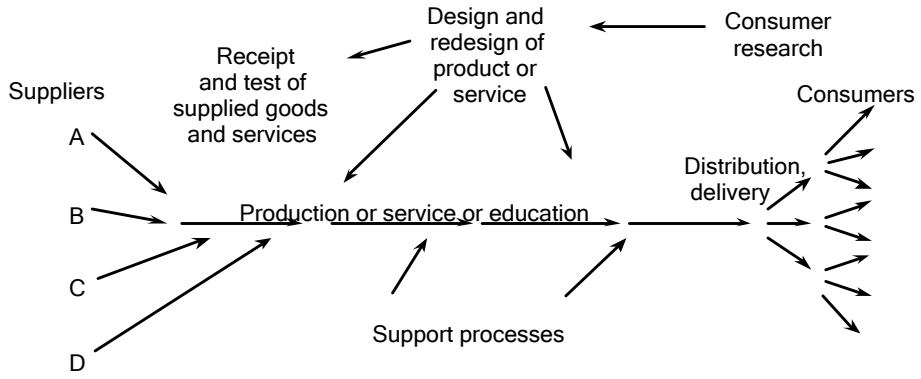

Figure 2. The organization viewed as a system

The systems view of the organization implies several things:

- The organization is oriented horizontally. That is, communication is focused horizontally, in line with the work. In this environment, focus is on the customers of your work and the consumers of the organization.
- Interdependence and interaction between departments are acknowledged and considered in planning and execution. Everyone in the organization is focused on the aims of the entire organization.
- These organizations tend to put less emphasis on detailed job descriptions. Instead, there is focus on the "why" of one's job. A common question asked is "how does my work fit in and contribute to the aim of the organization as a whole?"

Views of Variation

Nolan and Provost (1990) present a table (see Figure 3) which provides contrasting views of variation.

	Variation that indicates good or bad performance	**Variation that results from common or special causes**
Focus	Outcomes of the process (product or service)	Causes of variation in the process
Aim	Classify outcomes as acceptable or not	Provide a basis for action on the process
Basis	What the customer wants or needs	What the process is actually delivering
Methods	Specifications, budgets, forecasts, numerical goals, other tools for judging performance	Control charts

Figure 3. Two interpretations of variation

Each of these interpretations of variation has value when used appropriately. However, before Shewhart (and Deming for management applications), the view of variation as resulting from common and special causes did not exist. Still, viewing variation as judging performance good or bad overwhelms the Shewhart/Deming view.

The view of variation as judgment does nothing to improve. It loses sight of systems and looks for the reason (to assign blame) for any variation. An example came from touring a manufacturing plant. They

were having problems meeting schedule; not knowing what else to do, they recorded daily production numbers on an easel pad as shown in Figure 4. Adding the smiling faces next to the "good" numbers sent a clear message: "You did a good job to make the production schedule." There was no need to put frowning faces next to the "bad" numbers; the message was clear there as well: "What did you do wrong? Why didn't you work harder?"

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	26,152 ☺	18,461	18,349	29,515 ☺	25,668 ☺
Week 2	28,111 ☺	22,899	12,354	21,646	18,786
Week 3	16,394	19,358	14,925	28,876 ☺	22,132
Week 4	20,125	32,368 ☺	21,858	27,295 ☺	13,480
Week 5	19,324	26,286 ☺			

Figure 4. Daily production numbers

For these same data, I constructed a control chart. It is shown in Figure 5. The control chart shows that there is probably a stable system of production, although it exhibits a great deal of variation. This would lead to studying the process as a whole, searching for the causes of variation in production. The control chart shown in Figure 5 removes the focus on individual points, and helps focus on improvement of the system as a whole.

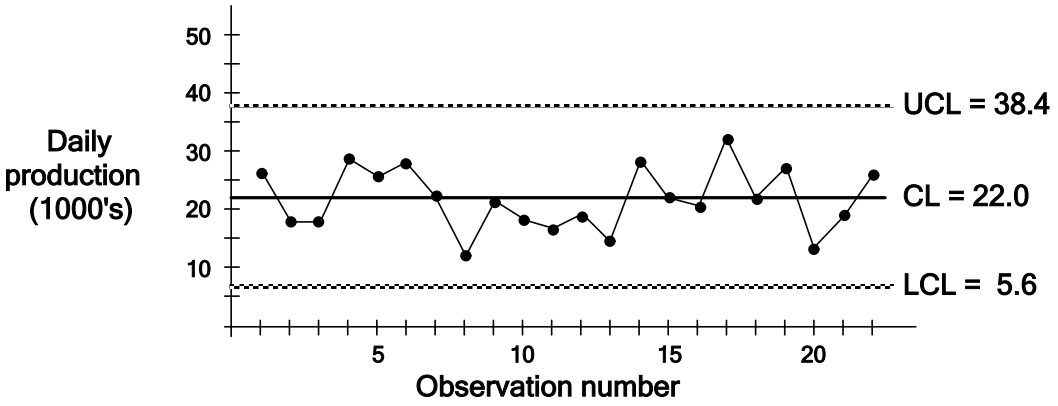

Figure 5. A control chart of daily production numbers

Views of Knowledge and Prediction

Knowledge from experience. I frequently hear people talk about all they have learned through experience. Experience does help us learn, but it often reinforces what we already "know." If we take in data, we often shape the data to reinforce our beliefs. If the data do not fit our experience, we explain them away or deny them. In short, our experience teaches us, but it can also limit what we can learn.

This is pictured in the systems diagram Figure 6 (constructed as in Senge (1989)). The picture in the middle of the figure is a snowball rolling downhill, a cue Senge uses for a reinforcing cycle. Figure 6 shows how experience and perception of cause and effect reinforce each other. This reinforcement can be either positive or negative.

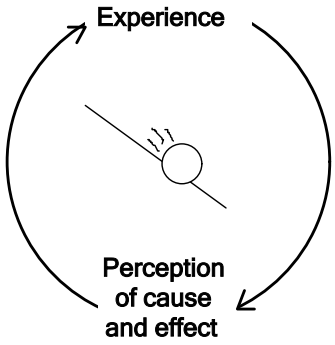

Figure 6. Observation reinforcing experience

As an example, consider a school I once visited: this school had high absenteeism and tardiness and wanted to reduce their incidence. When I asked what they had tried, they responded that they had instituted tough new rules. When asked how the rules were working, they did not know. (They had made a change, but hadn't gathered data to assess the effectiveness of their change!) When they gathered the data, the results were a big disappointment: absenteeism and tardiness were still too high. Instead of questioning the benefit of tough rules, they decided that the rules were not tough enough, and should be made more extreme. After all, the students were hard cases and would have to be shown that if they missed school they would pay. Their perspective is illustrated in Figure 7.

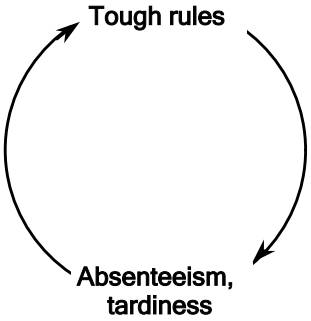

Figure 7. Absenteeism and tardiness balanced with tough rules

Knowledge from theory. Experience may provide a starting point for learning, but a system of profound knowledge provides a different, independent perspective to allow us to see that which, through our default lens, we could not see. This is illustrated in Figure 8.

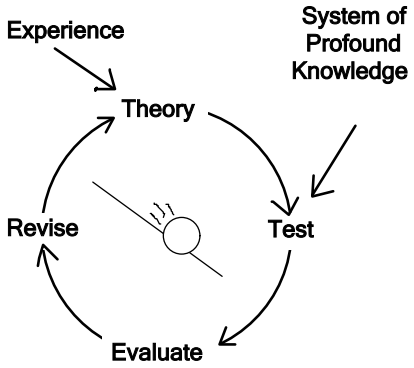

Figure 8. Knowledge from theory

In the school example introduced above, some teachers had studied a system of profound knowledge; they wondered about the system aim. In this case, the aim was to have students "in class, ready to learn." Given this aim, it became apparent that the "tough rules" approach was inappropriate; when considered from the systems perspective, it was clear that "in class" and "ready to learn" are not independent. These teachers studied what impact the tough rules had, not only on attendance, but also on indicators like classroom disruptions and quality of relationship between teachers and students (indicators of readiness to learn). They saw that the tough rules which were intended to get students in class were undermining their ability to accomplish the aim of having students ready to learn.

With this recognition, these teachers began to focus on addressing the problem of absenteeism and tardiness, not by working on getting the students in class, but rather by engaging the students, helping them be ready to learn. Their theory was that if the students are ready to learn and engaged in class, attendance will not be a problem. These teachers began challenging basic assumptions about high school teaching, such as 50 minute class periods in single classrooms: they tried two to four hour classes taught by interdisciplinary teams. The systems diagram of this example is shown in Figure 9. The diagram illustrates that focus on the upper (symptomatic) loop undermines the ability to address the lower (fundamental solution) loop.

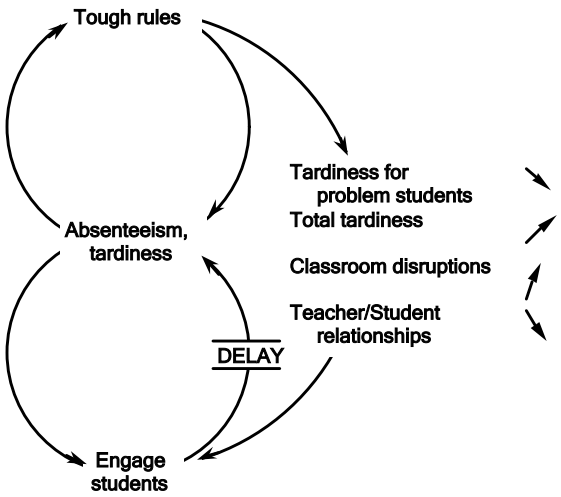

Figure 9. The systems view of absenteeism

Views of Cause and Effect

Many people manage organizations as though causes and effects have very simple, direct, one-to-one relationships, as illustrated in Figure 101. They look for **the** cause of an outcome and try to impact the outcome of interest, never taking into account the impact their action will have on other outcomes of interest. This is one of the potentially biggest problems with management by objectives.

Figure 10. A simple view of cause and effect

In reality, Senge (1989) teaches us that cause and effect are separated in time and space. We want to definitively attribute cause and effect. However, Senge points out that it isn't nearly so easy, that causes

and effects are complexly intertwined, more like Figure 11 than Figure 10.

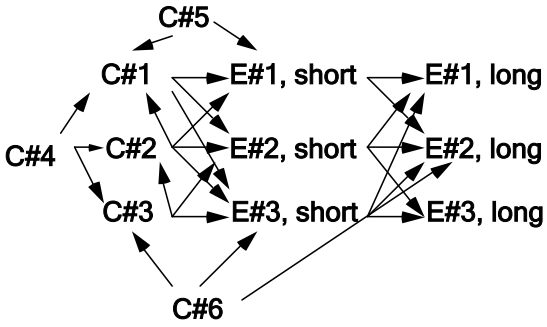

Figure 11. A more realistic view of cause and effect

Figure 11 illustrates that any actions we take have, at least, short term and long term effects, as well as impacting several outcomes and also interacting with other factors.

When we act ignoring the complexity of these relationships and pretending the world is like Figure 10, we often suboptimize the system; that is, we optimize a part at the expense of the whole.

A good example of someone who understood the system and what he needed to do to optimize it was Tommy Henrich, a baseball player for the New York Yankees in the 1940s. Consider the following exchange, related by Halberstam (1989, page 64):

> (Tommy) Henrich (New York Yankee) had always been a good player, one whose value belied the more ordinary quality of his statistics. He had come up through hard times, when Ed Barrow ran the team. After one season Henrich asked Barrow for a raise. Barrow replied by citing Henrich's batting average. It was quite disappointing, Barrow said. In fact, he was thinking of cutting him for the next year. Henrich stood his ground. "What do you want, a higher batting average for me personally or value to the team? Every day, every at-bat, I do what's good for the team, I move runners around, and I knock runners in. But if you want batting average I'll give that to you next year. It'll weaken the team, but you can have what you want." Barrow recanted and Henrich got a raise of $2,000.

This passage shows that even the statistics of players on a baseball team interact, and are not purely a reflection of the talents and abilities of their owners. Such things as where players bat in the line-up and how strong the other hitters are can impact a player's personal statistics, as well as the role they play on the team.

Views about Relationships

Win-lose (really lose-lose) versus win-win. Inside most organizations there are many win-lose relationships. Departments are in competition for scarce resources, and will do anything required to get the resources. Why? Because, often, individual compensation and status rely on individual's "winning" regardless of the effect on the organization as a whole.

If win-lose relationships are common inside organizations, they are more prevalent in dealings with suppliers and even customers. Deming (1993, page 74) relates a powerful story in a letter sent to him:

> My marriage went from rough to rocky, rougher to rockier, eternal trouble, win, lose, each one jockeying to be the winner. I took your seminar and learned about a system, cooperation, win, win. I explained it to my husband. We thereupon worked together on every detail, seeking win, win: both of us win. We both won. Who would wish to compete in

a marriage? The winner would be married to a loser. Who would wish to be married to a loser?

This letter raises a good question: Who would wish to do business with a loser? would anyone wish for his supplier to be a loser? … his customer? … his employees? … the employees of his supplier, of his customers? Of course not."

SUMMARY

Dr. Deming's teaching was not just about doing things a little differently. Deming challenged organizations to become open to different ways of thinking and of viewing the world around them. As they look at the world differently, they will change the way they do things, and these changes will leave them transformed, not recognizable to people familiar with what they were before. Since Deming died, many of the practices that he disagreed with have become much more entrenched: emphasis on achieving quarterly financials at all costs (or appearing to achieve them), reliance on merit appraisals and management by number. Deming's ideas are at least as relevant in this environment as they were in 1993, when he last lectured about them.

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