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THE FIFTH DISCIPLINE

The Art & Practice of the Learning Organization

PETER M. SENGE

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THE ART AND PRACTICE OF THE LEARNING ORGANIZATION

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INTRODUCTION TO THE REVISED EDITION

THE PREVAILING SYSTEM OF MANAGEMENT

In the spring of 1990, shortly after the writing and editing of the original edition of *The Fifth Discipline* was completed and publication was imminent, my editor at Doubleday asked me who I wanted to write a comment for the book jacket. As a first time author, I had never considered this. After thinking for a while I realized that there was no one I would rather have write something than Dr. W. Edwards Deming, revered around the world as a pioneer in the quality management revolution. I knew of no one who had had a greater impact on management practice. But I had never met Deming. I doubted that a letter with such a request from an unknown author, referring to work with which Deming was unfamiliar, would get a favorable response. Fortunately, through mutual friends at Ford, a copy of the manuscript did reach him. A few weeks later, to my surprise, a letter arrived at my home.

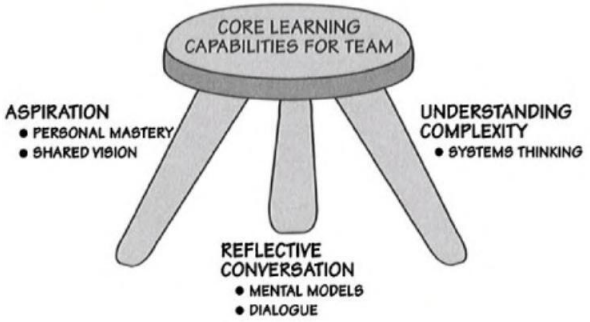
When I opened it I found a short paragraph written by Dr, Deming. Reading the first sentence, I stopped to catch my breath. Somehow he had said in a sentence what I had struggled to put into four hundred pages pages. It is amazing, I thought, how clear and direct you can be when you reach the end of your years (Deming was then almost 90). As I took in the totality of what he had written, I slowly started to realize he had unveiled a deeper layer of connections, and a bigger task, than I had previously understood:

> Our prevailing system of management has destroyed our people. People are born with intrinsic motivation, self-respect, dignity, curiosity to learn, joy in learning. The forces of destruction begin with toddlers—a prize for the best Halloween costume, grades in school, gold stars—and on up through the university. On the job, people, teams, and divisions are ranked, reward for the top, punishment for the bottom. Management by Objectives, quotas, incentive pay, business plans, put together separately, division by division, cause further loss, unknown and unknowable.

As I subsequently learned, Deming had almost completely stopped using the terminology of "Total Quality Management," "TQM" or "TQ" because he believed it had become a superficial label for tools and techniques. The real work, which he simply called the "transformation of the prevailing system of management," lay beyond the aims of managers seeking only short-term performance improvements. This transformation, he believed, required "profound knowledge" largely untapped in contemporary institutions. Only one element of this profound knowledge, "theory of variation" (statistical theory and method), was associated with the common understanding of TQM. The other three elements, to my amazement, mapped almost directly onto the five disciplines: "understanding a system," " theory of knowledge" (the importance of mental models), and "psychology," especially "intrinsic motivation" (the importance of personal vision and genuine aspiration).

These elements of Deming's "profound knowledge" led eventually to the simplest and, today, most widely used way to present the five learning disciplines, a way that was not evident when the original book was completed. The five disciplines represent approaches (theories and methods) for developing three core learning capabilities: fostering aspiration, developing reflective conversation, and understanding complexity. Building on an idea from the original

book, that the fundamental learning units in an organization are working teams (people who need one another to produce an outcome), we came to refer to these as the "core learning capabilities of teams" and symbolically represented them as a three-legged stool, to visually convey the importance of each—the stool would not stand if any of the three were missing.



Even more important for me was Deming's idea that a common "system of management" governed modern institutions, and in particular formed a deep connection between work and school. He would often say, "We will never transform the prevailing system of management without transforming our prevailing system of education. They are the same system." So far as I know, his insight into this connection between work and school was original.

I believe that Deming came to this realization late in his life, in part as a way to make sense of why so few managers seemed able to actually implement real Quality Management as he conceived it. People failed, he realized, because they had been socialized in ways of thinking and acting that were embedded in their most formative institutional experiences. "The relationship between a boss and subordinate is the same as the relationship between a teacher and student," he said. The teacher sets the aims, the student responds to those aims. The teacher has the answer, the student works to get the answer. Students know when they have succeeded because the teacher tells them. By the time all children are 10 they know what it takes to get ahead in school and please the teacher —a lesson they carry forward through their careers of "pleasing bosses and failing to improve the system that serves customers." After Dr. Deming passed away in 1993, I spent many years thinking and talking with

colleagues about what constituted this prevailing system of management as Deming understood it, eventually settling on eight basic elements:[1]

- Management by measurement:
  - Focusing on short-term metrics
  - Devaluing intangibles
    ("You can only measure 3 percent of what matters"
    – W.E. Deming)

- Compliance-based cultures
  - Getting ahead by pleasing the boss
  - Management by fear

- Managing outcomes
  - Management sets targets
  - People are held accountable for meeting management targets (regardless of whether they are possible within existing system and processes)

- "Right answers" vs. "wrong answers"
  - Technical problem solving is emphasized
  - Diverging (systemic) problems are discounted

- Uniformity
  - Diversity is a problem to be solved
  - Conflict is suppressed in favor of superficial agreement

- Predictability and controllability
  - To manage is to control
  - The "holy trinity of management" is planning, organizing, controlling

- Excessive competitiveness and distrust
  - Competition between people is essential to achieve desired performance
  - Without competition among people there is no innovation
    ("We've been sold down the river by competition"
    – W.E. Deming)

- Loss of the whole
  - Fragmentation
  - Local innovations do not spread

Today, most managers probably regard the "Quality Management revolution," like the organizational learning fad of the early 1990s, as history, far from the frontiers of today's challenges. But is that because we have achieved or abdicated the transformation Deming advocated? It is hard for me to contemplate a list like this one and not feel that these maladies still afflict most organizations today, and that it will take generations, not years, to change such deeply embedded beliefs and behaviors. Indeed, perhaps the most obvious question for many of us is: "Will this system of management ever change on a large scale?" Answering deep questions like this about the future requires looking carefully at the present.

A TIME OF CROSSCURRENTS

In the decade and a half since *The Fifth Discipline* was first published much has changed in the world. Our economies are more global than ever; consequently, so is business. Among businesses competing globally, cost and performance pressures are relentless. The time available for people to think and reflect is scarcer, if anything, and in many organizations, resources available for developing people are scarcer still. But there is more to think about than just accelerating change. The globalization of business and industrial development is raising the material standards of living for many, but also creating significant side effects in the form of a host of social and environmental sustainability challenges. All too often, the production of financial capital seems to occur at the expense of social and natural capital. Gaps between "haves" and "have-nots" are widening in many countries. Local environmental stresses, always a feature of industrial development, are now matched by problems on a larger scale, like global warming and weather instability. While the advocates for global industrial growth trumpet its benefits, people around the world are reacting, nonviolently and violently, to losses in traditional ways of living—and this shifting context is getting onto the strategic radar screen of many businesses.

At the same time, the interconnected world creates a greater awareness of others than has ever before existed. It is an unprecedented time of cultures colliding and in many instances learning from one another, and the promise of truly generative "dialogue among civilizations" holds great hope for the future. Young people around the world are creating a web of relationships that has never existed before. The frontiers of Western science, the underpinning of our modern worldview, are revealing a living world of flux and interdependency strangely familiar to aboriginal and native cultures, and one that might, in the words of cosmologist Brian Swimme, once again show us that we have "a meaningful place in the universe." And, as illustrated below, the organizational learning practices that were limited to a few pioneers fifteen years ago have taken deeper root and spread.

In short, it is a time of dramatically conflicting forces. Things are getting better and things are getting worse. The comments of former Czech president Vaclav Havel's to the U.S. Congress in the mid-1990s summarize these perilous times aptly:

> Today, many things indicate that we are going through a transitional period, when it seems that something is on the way out and something else is painfully being born. It is as if something were crumbling, decaying and exhausting itself, while something else, still indistinct, were arising from the rubble.

The shape of Havel's "something else" being born and the sorts of management and leadership skills it might require remain as fuzzy today as they were when he made these remarks a decade ago.

These conflicting forces play out within organizations as well, creating environments in which the need and possibility for learning capabilities are greater than ever, but so too are the challenges of building such capabilities. On one hand, building enterprises capable of continually adapting to changing realities clearly demands new ways of thinking and operating. So do the sustainability challenges, in many ways the archetypal organizational learning challenge of this era. In addition, organizations are becoming more networked, which is weakening traditional management hierarchies and potentially opening up new capacity for continual learning, innovation, and adaptation. On the other hand, the dysfunctions of the traditional management system keep many organizations in per-

petual fire-fighting mode, with little time or energy for innovation. This frenzy and chaos also undermines the building of values-based management cultures and opens the door for opportunistic grabs at individual power and wealth.

VOICES FROM THE FRONT

When I was invited by Doubleday to create this new edition of *The Fifth Discipline*, I was initially ambivalent but then became excited. One of the great joys of the past fifteen years has been getting to know countless gifted practitioners of organizational learning—managers, school principals, community organizers, police chiefs, business and social entrepreneurs, military leaders, teachers—people who have somehow found an infinite array of imaginative ways to work with and utilize the five disciplines, even if they had never heard of or read the original book. A few of these figured prominently in the first book, like Arie de Geus and the recently deceased Bill O'Brien. Since then, the worldwide growth of the Society for Organizational Learning (SoL) has brought me in touch with hundreds more such practitioners. In their own ways, each has created an alternative system of management based on love rather than fear, curiosity rather than an insistence on "right" answers, and learning rather than controlling. Now I could use the excuse of this revised edition to talk with many of them.

Those interviews and conversations led to my making many changes in the text of this book and to a new section, Part IV, "Reflections from Practice." The interviews provided fresh insights into how master practitioners initiate change and deal creatively with the challenges of sustaining momentum. In addition to many business successes, people revealed a host of new possibilities in applying organizational learning tools and principles in areas few of us could have imagined fifteen years ago: from growing more environmentally sound businesses and industries to addressing societal problems like gang violence, transforming school systems, promoting economic development, undertaking the improvement of global food production, and reducing poverty. In all these settings, openness, reflection, deeper conversations, personal mastery, and shared visions uniquely energize change; and understanding the systemic causes of problems is crucial.

The interviews also clarified core ideas that implicitly bound together the original work.

• *There are ways of working together that are vastly more satisfying and more productive than the prevailing system of management.* As one senior executive said, reflecting on her first learning experiment—"just getting people to talk to one another" as a way to rethink how their organization was structured—". . . was the most fun I had ever had in business, and the ideas that emerged are still creating a competitive advantage for the company fifteen years later."

• *Organizations work the way they do because of how we work, how we think and interact; the changes required ahead are not only in our organizations but in ourselves as well.* "The critical moment comes when people realize that this learning organization work is about each one of us," commented a twenty-year veteran of corporate organizational learning projects. "Personal mastery is core. If you get the personal mastery element of these changes right, everything else falls into place."

• *In building learning organizations there is no ultimate destination or end state, only a lifelong journey.* "This work requires great reservoirs of patience," commented the president of a global NGO (nongovernmental organization), "but I believe the results we achieve are more sustainable because the people involved have really grown. It also prepares people for the ongoing journey. As we learn, grow, and tackle more systemic challenges, things do not get easier."

I believe that, the prevailing system of management is, at its core, dedicated to mediocrity. It forces people to work harder and harder to compensate for failing to tap the spirit and collective intelligence that characterizes working together at their best. Deming saw this clearly, and I believe that now, so do a growing number of leaders committed to growing organizations capable of thriving in and contributing to the extraordinary challenges and possibilities of the world we are living into.

PART I

How Our Actions Create Our Reality . . . and How We Can Change It

1

"GIVE ME A LEVER LONG ENOUGH...AND SINGLE-HANDED I CAN MOVE THE WORLD"

From a very early age, we are taught to break apart problems, to fragment the world. This apparently makes complex tasks and subjects more manageable, but we pay a hidden, enormous price. We can no longer see the consequences of our actions; we lose our intrinsic sense of connection to a larger whole. When we then try to "see the big picture," we try to reassemble the fragments in our minds, to list and organize all the pieces. But, as physicist David Bohm says, the task is futile—similar to trying to reassemble the fragments of a broken mirror to see a true reflection. Thus, after a while we give up trying to see the whole altogether.

The tools and ideas presented in this book are for destroying the illusion that the world is created of separate, unrelated forces. When we give up this illusion—we can then build "learning organizations," organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together.

As the world becomes more interconnected and business becomes more complex and dynamic, work must become more "learningful." It is no longer sufficient to have one person learning for the organization, a Ford or a Sloan or a Watson or a Gates. It's just not possible any longer to figure it out from the top, and have everyone else following the orders of the "grand strategist." The organizations that will truly excel in the future will be the organizations that discover how to tap people's commitment and capacity to learn at all levels in an organization.

Learning organizations are possible because, deep down, we are all learners. No one has to teach an infant to learn. In fact, no one has to teach infants anything. They are intrinsically inquisitive, masterful learners who learn to walk, speak, and pretty much run their households all on their own. Learning organizations are possible because not only is it our nature to learn but we love to learn. Most of us at one time or another have been part of a great team, a group of people who functioned together in an extraordinary way—who trusted one another, who complemented one anothers's strengths and compensated for one another's limitations, who had common goals that were larger than individual goals, and who produced extraordinary results. I have met many people who have experienced this sort of profound teamwork—in sports, or in the performing arts, or in business. Many say that they have spent much of their life looking for that experience again. What they experienced was a learning organization. The team that became great didn't start off great—it *learned* how to produce extraordinary results.

One could argue that the entire global business community is learning to learn together, becoming a learning community. Whereas once many industries were dominated by a single, undisputed leader—one IBM, one Kodak, one Xerox—today industries, especially in manufacturing, have dozens of excellent companies. American, European, or Japanese corporations are pulled forward by innovators in China, Malaysia, or Brazil, and they in turn, are pulled by the Koreans and Indians. Dramatic improvements take place in corporations in Italy, Australia, Singapore—and quickly become influential around the world.

There is also another, in some ways deeper, movement toward learning organizations, part of the evolution of industrial society. Material affluence for the majority has gradually shifted people's orientation toward work—from what Daniel Yankelovich called an "instrumental" view of work, where work was a means to an end, to

a more "sacred" view, where people seek the "intrinsic" benefits of work.[1] "Our grandfathers worked six days a week to earn what most of us now earn by Tuesday afternoon," says Bill O'Brien, former CEO of Hanover Insurance. "The ferment in management will continue until we build organizations that are more consistent with man's higher aspirations beyond food, shelter and belonging."

Moreover, many who share these values are now in leadership positions. I find a growing number of organizational leaders who, while still a minority, feel they are part of a profound evolution in the nature of work as a social institution. "Why can't we do good works at work?" asked Edward Simon, former president of Herman Miller, a sentiment I often hear repeated today. In founding the "Global Compact," UN Secretary General Kofi Annan invited businesses around the world to build learning communities that elevate global standards for labor rights, and social and environmental responsibility.

Perhaps the most salient reason for building learning organizations is that we are only now starting to understand the capabilities such organizations must possess. For a long time, efforts to build learning organizations were like groping in the dark until the skills, areas of knowledge, and paths for development of such organizations became known. What fundamentally will distinguish learning organizations from traditional authoritarian "controlling organizations" will be the mastery of certain basic disciplines. That is why the "disciplines of the learning organization" are vital.

DISCIPLINES OF THE LEARNING ORGANIZATION

On a cold, clear morning in December 1903, at Kitty Hawk, North Carolina, the fragile aircraft of Wilbur and Orville Wright proved that powered flight was possible. Thus was the airplane invented; but it would take more than thirty years before commercial aviation could serve the general public.

Engineers say that a new idea has been "invented" when it is proven to work in the laboratory. The idea becomes an "innovation" only when it can be replicated reliably on a meaningful scale at practical costs. If the idea is sufficiently important, such as the telephone, the digital computer, or commercial aircraft, it is called a "basic innovation," and it creates a new industry or transforms an

existing industry. In these terms, learning organizations have been invented, but they have not yet been innovated.

In engineering, when an idea moves from an invention to an innovation, diverse "component technologies" come together. Emerging from isolated developments in separate fields of research, these components gradually form an ensemble of technologies that are critical to one another's success. Until this ensemble forms, the idea, though possible in the laboratory, does not achieve its potential in practice.[2]

The Wright brothers proved that powered flight was possible, but the McDonnel Douglas DC-3, introduced in 1935, ushered in the era of commercial air travel. The DC-3 was the first plane that supported itself economically as well as aerodynamically. During those intervening thirty years (a typical time period for incubating basic innovations), myriad experiments with commercial flight had failed. Like early experiments with learning organizations, the early planes were not reliable and cost-effective on an appropriate scale.

The DC-3, for the first time, brought together five critical component technologies that formed a successful ensemble. They were: the variable-pitch propeller, retractable landing gear, a type of lightweight molded body construction called "monocque," a radial air-cooled engine, and wing flaps. To succeed, the DC-3 needed all five; four were not enough. One year earlier, the Boeing 247 was introduced with all of them except wing flaps. Boeing's engineers found that the plane, lacking wing flaps, was unstable on takeoff and landing, and they had to downsize the engine.

Today, I believe, five new component technologies are gradually converging to innovate learning organizations. Though developed separately, each will, I believe, prove critical to the others' success, just as occurs with any ensemble. Each provides a vital dimension in building organizations that can truly "learn," that can continually enhance their capacity to realize their highest aspirations:

Systems Thinking. A cloud masses, the sky darkens, leaves twist upward, and we know that it will rain. We also know the storm runoff will feed into groundwater miles away, and the sky will clear by tomorrow. All these events are distant in time and space, and yet they are all connected within the same pattern. Each has an influence on the rest, an influence that is usually hidden from view. You can only understand the system of a rainstorm by contemplating the whole, not any individual part of the pattern.

Business and other human endeavors are also systems. They,

too, are bound by invisible fabrics of interrelated actions, which often take years to fully play out their effects on each other. Since we are part of that lacework ourselves, it's doubly hard to see the whole pattern of change. Instead, we tend to focus on snapshots of isolated parts of the system, and wonder why our deepest problems never seem to get solved. Systems thinking is a conceptual framework, a body of knowledge and tools that has been developed over the past fifty years, to make the full patterns clearer, and to help us see how to change them effectively.

Though the tools are new, the underlying worldview is extremely intuitive; experiments with young children show that they learn systems thinking very quickly.

Personal Mastery. "Mastery" might suggest gaining dominance over people or things. But mastery can also mean a special level of proficiency. A master craftsman doesn't dominate pottery or weaving. People with a high level of personal mastery are able to consistently realize the results that matter most deeply to them—in effect, they approach their life as an artist would approach a work of art. They do that by becoming committed to their own lifelong learning.

Personal mastery is the discipline of continually clarifying and deepening our personal vision, of focusing our energies, of developing patience, and of seeing reality objectively. As such, it is an essential cornerstone of the learning organization—the learning organization's spiritual foundation. An organization's commitment to and capacity for learning can be no greater than that of its members. The roots of this discipline lie in both Eastern and Western spiritual traditions, and in secular traditions as well.

Bu few organizations encourage the growth of their people in this manner. This results in vast untapped resources: "People enter business as bright, well-educated, high-energy people, full of energy and desire to make a difference," says Hanover's O'Brien. "By the time they are 30, a few are on the fast track and the rest 'put in their time' to do what matters to them on the weekend. They lose the commitment, the sense of mission, and the excitement with which they started their careers. We get damn little of their energy and almost none of their spirit."

And surprisingly few adults work to rigorously develop their own personal mastery. When you ask most adults what they want from their lives, they often talk first about what they'd like to get rid of: "I'd like my mother-in-law to move out," they say, or "I'd

like my back problems to clear up." The discipline of personal mastery starts with clarifying the things that really matter to us, of living our lives in the service of our highest aspirations.

Here, I am most interested in the connections between personal learning and organizational learning, in the reciprocal commitments between individual and organization, and in the special spirit of an enterprise made up of learners.

Mental Models. Mental models are deeply ingrained assumptions, generalizations, or even pictures or images that influence how we understand the world and how we take action. Very often, we are not consciously aware of our mental models or the effects they have on our behavior. For example, we may notice that a co-worker dresses elegantly, and say to ourselves, "She's a country club person." About someone who dresses shabbily, we may feel, "He doesn't care about what others think." Mental models of what can or cannot be done in different management settings are no less deeply entrenched. Many insights into new markets or outmoded organizational practices fail to get put into practice because they conflict with powerful, tacit mental models.

For example, in the early 1970s, Royal Dutch/Shell, became one of the first large organizations to understand how pervasive was the influence of hidden mental models. Shell's success in the 1970s and 1980s (rising from one of the weakest of the big seven oil companies to one of the strongest along with Exxon) during a period of unprecedented changes in the world oil business—the formation of OPEC, extreme fluctuations in oil prices and availability, and the eventual collapse of the Soviet Union—came in large measure from learning how to surface and challenge managers' mental models as a discipline for preparing change. Arie de Geus, Shell's Coordinator of Group Planning during the 80s, said that continuous adaptation and growth in a changing business environment depends on "institutional learning, which is the process whereby management teams change their shared mental models of the company, their markets, and their competitors. For this reason, we think of planning as learning and of corporate planning as institutional learning."[3]

The discipline of working with mental models starts with turning the mirror inward; learning to unearth our internal pictures of the world, to bring them to the surface and hold them rigorously to scrutiny. It also includes the ability to carry on "learningful" conversations that balance inquiry and advocacy, where

people expose their own thinking effectively and make that thinking open to the influence of others.

Building Shared Vision. If any one idea about leadership has inspired organizations for thousands of years, it's the capacity to hold a shared picture of the future we seek to create. One is hard-pressed to think of any organization that has sustained some measure of greatness in the absence of goals, values, and missions that become deeply shared throughout the organization. IBM had "service"; Polaroid had instant photography; Ford had public transportation for the masses and Apple had "computers for the rest of us."[4] Though radically different in content and kind, all these organizations managed to bind people together around a common identity and sense of destiny.

When there is a genuine vision (as opposed to the all-too-familiar "vision statement"), people excel and learn, not because they are told to, but because they want to. But many leaders have personal visions that never get translated into shared visions that galvanize an organization. All too often, a company's shared vision has revolved around the charisma of a leader, or around a crisis that galvanizes everyone temporarily. But, given a choice, most people opt for pursuing a lofty goal, not only in times of crisis but at all times. What has been lacking is a discipline for translating individual vision into shared vision—not a "cookbook" but a set of principles and guiding practices.

The practice of shared vision involves the skills of unearthing shared "pictures of the future" that foster genuine commitment and enrollment rather than compliance. In mastering this discipline, leaders learn the counterproductiveness of trying to dictate a vision, no matter how heartfelt.

Team Learning. How can a team of committed managers with individual IQs above 120 have a collective IQ of 63? The discipline of team learning confronts this paradox. We know that teams can learn; in sports, in the performing arts, in science, and even, occasionally, in business, there are striking examples where the intelligence of the team exceeds the intelligence of the individuals in the team, and where teams develop extraordinary capacities for coordinated action. When teams are truly learning, not only are they producing extraordinary results, but the individual members are growing more rapidly than could have occurred otherwise.

The discipline of team learning starts with "dialogue," the capacity of members of a team to suspend assumptions and enter into a genuine "thinking together." To the Greeks dia-logos meant a free-flowing of meaning through a group, allowing the group to discover insights not attainable individually. Interestingly, the practice of dialogue has been preserved in many "primitive" cultures, such as that of the American Indian, but it has been almost completely lost to modern society. Today, the principles and practices of dialogue are being rediscovered and put into a contemporary context. (Dialogue differs from the more common "discussion," which has its roots with "percussion" and "concussion," literally a heaving of ideas back and forth in a winner-takes-all competition.)

The discipline of dialogue also involves learning how to recognize the patterns of interaction in teams that undermine learning. The patterns of defensiveness are often deeply ingrained in how a team operates. If unrecognized, they undermine learning. If recognized and surfaced creatively, they can accelerate learning.

Team learning is vital because teams, not individuals, are the fundamental learning unit in modern organizations. This is where the rubber meets the road; unless teams can learn, the organization cannot learn.

If a learning organization were an engineering innovation, such as the airplane or the personal computer, the components would be called "technologies." For an innovation in human behavior, the components need to be seen as *disciplines*. By "discipline," I do not mean an "enforced order" or "means of punishment," but a body of theory and technique that must be studied and mastered to be put into practice. A discipline (from the Latin *disciplina*, to learn) is a developmental path for acquiring certain skills or competencies. As with any discipline, from playing the piano to electrical engineering, some people have an innate gift, but anyone can develop proficiency through practice.

To practice a discipline is to be a lifelong learner. You never arrive; you spend your life mastering disciplines. You can never say, "We are a learning organization," any more than you can say, "I am an enlightened person." The more you learn, the more acutely aware you become of your ignorance. Thus, a corporation cannot be "excellent" in the sense of having arrived at a permanent excellence; it is always in the state of practicing the disciplines of learning, of getting better or worse.

That organizations can benefit from disciplines is not a totally new idea. After all, management disciplines such as accounting have been around for a long time. But the five learning disciplines differ from more familiar management disciplines in that they are personal disciplines. Each has to do with how we think and how we interact and learn with one another. In this sense, they are more like artistic disciplines than traditional management disciplines. Moreover, while accounting is good for "keeping score," we have never approached the subtler tasks of building organizations, of enhancing their capabilities for innovation and creativity, of crafting strategy and designing policy and structure through assimilating new disciplines. Perhaps this is why, all too often, great organizations are fleeting, enjoying their moment in the sun, then passing quietly back to the ranks of the mediocre.

Practicing a discipline is different from emulating a model. All too often, new management innovations are described in terms of the "best practices" of so-called leading firms. I believe benchmarking best practices can open people's eyes as to what is possible, but it can also do more harm than good, leading to piecemeal copying and playing catch-up. As one seasoned Toyota manager commented after hosting over a hundred tours for visiting executives, "They always say 'Oh yes, you have a Kan-Ban system, we do also. You have quality circles, we do also. Your people fill out standard work descriptions, ours do also.' They all see the parts and have copied the parts. What they do not see is the way all the parts work together." I do not believe great organizations have ever been built by trying to emulate another, any more than individual greatness is achieved by trying to copy another "great person."

When the five component technologies converged to create the DC-3 the commercial airline industry began. But the DC-3 was not the end of the process. Rather, it was the precursor of a new industry. Similarly, as the five component learning disciplines converge they will not create *the* learning organization but rather a new wave of experimentation and advancement.

THE FIFTH DISCIPLINE

It is vital that the five disciplines develop as an ensemble. This is challenging because it is much harder to integrate new tools than simply apply them separately. But the payoffs are immense.

This is why systems thinking is the fifth discipline. It is the disci-

pline that integrates the disciplines, fusing them into a coherent body of theory and practice. It keeps them from being separate gimmicks or the latest organization change fads. Without a systemic orientation, there is no motivation to look at how the disciplines interrelate. By enhancing each of the other disciplines, it continually reminds us that the whole can exceed the sum of its parts.

For example, vision without systems thinking ends up painting lovely pictures of the future with no deep understanding of the forces that must be mastered to move from here to there. This is one of the reasons why many firms that have jumped on the "vision bandwagon" in recent years have found that lofty vision alone fails to turn around a firm's fortunes. Without systems thinking, the seed of vision falls on harsh soil. If nonsystemic thinking predominates, the first condition for nurturing vision is not met: a genuine belief that we can make our vision real in the future. We may say "We can achieve our vision" (most American managers are conditioned to this belief), but our tacit view of current reality as a set of conditions created by somebody else betrays us.

But systems thinking also needs the disciplines of building shared vision, mental models, team learning, and personal mastery to realize its potential. Building shared vision fosters a commitment to the long term. Mental models focus on the openness needed to unearth shortcomings in our present ways of seeing the world. Team learning develops the skills of groups of people to look for the larger picture beyond individual perspectives. And personal mastery fosters the personal motivation to continually learn how our actions affect our world. Without personal mastery, people are so steeped in the reactive mindset ("someone/something else is creating my problems") that they are deeply threatened by the systems perspective.

Lastly, systems thinking makes understandable the subtlest aspect of the learning organization—the new way individuals perceive themselves and their world. At the heart of a learning organization is a shift of mind—from seeing ourselves as separate from the world to connected to the world, from seeing problems as caused by someone or something "out there" to seeing how our own actions create the problems we experience. A learning organization is a place where people are continually discovering how they create their reality. And how they can change it. As Archimedes said, "Give me a lever long enough . . . and single-handed I can move the world."

METANOIA—A SHIFT OF MIND

When you ask people about what it is like being part of a great team, what is most striking is the meaningfulness of the experience. People talk about being part of something larger than themselves, of being connected, of being generative. It becomes quite clear that, for many, their experiences as part of truly great teams stand out as singular periods of life lived to the fullest. Some spend the rest of their lives looking for ways to recapture that spirit.

The most accurate word in Western culture to describe what happens in a learning organization is one that hasn't had much currency for the past several hundred years. It is a word we have used in our work with organizations for some ten years, but we always caution them, and ourselves, to use it sparingly in public. The word is "metanoia" and it means a shift of mind. The word has a rich history. For the Greeks, it meant a fundamental shift or change, or more literally transcendence ("*meta*"—above or beyond, as in "metaphysics") of mind ("*noia*," from the root "*nous*," of mind). In the early (Gnostic) Christian tradition, it took on a special meaning of awakening shared intuition and direct knowing of the highest, of God. "Metanoia" was probably the key term of such early Christians as John the Baptist. In the Catholic corpus the word "metanoia" was eventually translated as "repent."

To grasp the meaning of "metanoia" is to grasp the deeper meaning of "learning," for learning also involves a fundamental shift or movement of mind. The problem with talking about "learning organizations" is that the "learning" has lost its central meaning in contemporary usage. Most people's eyes glaze over if you talk to them about "learning" or "learning organizations." The words tend to immediately evoke images of sitting passively in schoolrooms, listening, following directions, and pleasing the teacher by avoiding making mistakes. In effect, in everyday use, learning has come to be synonymous with "taking in information." "Yes, I learned all about that at the training yesterday." Yet, taking in information is only distantly related to real learning. It would be nonsensical to say, "I just read a great book about bicycle riding—I've now learned that."

Real learning gets to the heart of what it means to be human. Through learning we re-create ourselves. Through learning we become able to do something we never were able to do. Through learning we reperceive the world and our relationship to it. Through learning we extend our capacity to create, to be part of the genera-

tive process of life. There is within each of us a deep hunger for this type of learning. As anthropologist Edward Hall says, "Humans are the learning organism par excellence. The drive to learn is as strong as the sexual drive—it begins earlier and lasts longer."[5]

This, then, is the basic meaning of a "learning organization"—an organization that is continually expanding its capacity to create its future. For such an organization, it is not enough merely to survive. "Survival learning" or what is more often termed "adaptive learning" is important—indeed it is necessary. But for a learning organization, "adaptive learning" must be joined by "generative learning," learning that enhances our capacity to create.

A few brave organizational pioneers are pointing the way, but the territory of building learning organizations is still largely unexplored. It is my fondest hope that this book can accelerate that exploration.

PUTTING THE IDEAS INTO PRACTICE

I take no credit for inventing the five major disciplines of this book. The five disciplines described below represent the experimentation, research, writing, and invention of hundreds of people. But I have worked with all of the disciplines for years, refining ideas about them, collaborating on research, and introducing them to organizations throughout the world.

When I first entered graduate school at MIT I was already convinced that most of the problems faced by humankind concerned our inability to grasp and manage the increasingly complex systems of our world. Little has happened since to change my view. Today, the environmental crisis, the continuing gap between "haves and have-nots" and consequent social and political instability, the persisting global arms race, the international drug trade, and the explosive U.S. budget, trade deficits, and consequent financial fragility all attest to a world where problems are becoming increasingly complex and interconnected. From the start at MIT I was drawn to the work of Jay Forrester, a computer pioneer who had shifted fields to develop what he called "system dynamics." Jay maintained that the causes of many pressing public issues, from urban decay to global ecological threat, lay in the very well-intentioned policies designed to alleviate them. These problems were "actually systems" that lured policymakers into interventions that focused on obvious

symptoms not underlying causes, which produced short-term benefit but long-term malaise, and fostered the need for still more symptomatic interventions.

As I began my doctoral work, I began to meet business leaders who came to visit our MIT group to learn about systems thinking. These were thoughtful people, deeply aware of the inadequacies of prevailing ways of managing. Unlike most academics, they were engaged, not detached intellectuals, and many were working to build new types of organizations—decentralized, nonhierarchical organizations dedicated to the well-being and growth of employees as well as to success. Some had crafted radical corporate philosophies based on core values of freedom and responsibility. Others had developed innovative organization designs. All shared a commitment and a capacity to innovate that I found lacking in other sectors. Gradually, I came to realize why business is the locus of innovation in an open society. Despite whatever hold past thinking may have on the business mind, business has a freedom to experiment missing in the public and education sectors and, often, in nonprofit organizations. It also has a clear bottom line, so that experiments can be evaluated, at least in principle, by objective criteria.

But why were they interested in systems thinking? Too often, the most daring organizational experiments were foundering. Local autonomy produced business decisions that were disastrous for the organization as a whole. "Team building" exercises focused on better relationships among people who often still held radically different mental models of the business system. Companies pulled together during crises, and then lost all their inspiration when business improved. Organizations which started out as booming successes, with the best possible intentions toward customers and employees, found themselves trapped in downward spirals that got worse the harder they tried to fix them.

When I was a student and young professor, we all believed that the tools of systems thinking could make a difference in these companies. As I worked with different companies, I came to see why systems thinking was not enough by itself. It needed a new type of management practitioner to really make the most of it. At that time, in the mid-1970s, there was a nascent sense of what such a management practitioner could be. But it had not yet crystallized. It began to do so with the formation of a "CEO group" that met regularly at MIT starting around 1980 that included William O'Brien of Hanover Insurance, Arie de Geus of Shell, Edward Simon from Herman Miller, and Ray Stata, CEO of Analog Devices. The group

continued for over a decade eventually drawing participants from Apple, Ford, Harley-Davidson, Philips, Polaroid, and Trammell Crow.

For over twenty-five years I have also been involved in developing and conducting leadership workshops, which have introduced people from all walks of life to the fifth discipline ideas that grew out of our work at MIT. These ideas combined initially with Innovation Associate's path-breaking work on building shared vision and personal mastery and the workshops continue today as part of the global Society for Organizational Learning (SoL). When *The Fifth Discipline* was originally published, over four thousand managers had attended these workshops and they were in fact the "target audience" to whom the book was aimed. (When it became apparent that many more people were using the book as an introduction to organizational learning, we created *The Fifth Discipline Fieldbook* in 1994, thinking that a book of practical tools, stories, and tips might in fact be a better introduction.) Over the course of these experiences the initial focus on corporate senior executives broadened, as it became evident that the basic disciplines of systems thinking, personal mastery, mental models, team learning and shared vision were relevant for teachers, public administrators and elected officials, students, and parents. All were in leadership positions of importance. All were in "organizations" that had still untapped potential for creating their future. All felt that to tap that potential required developing their own capacities, that is, learning.

So, this book is for the learners, especially those of us interested in the art and practice of collective learning.

For managers, this book should help in identifying the specific practices, skills, and disciplines that can make building learning organizations less of an occult art (though an art nonetheless).

For parents, this book should help in letting our children be our teachers, as well as we are theirs—for they have much to teach us about learning as a way of life.

For citizens, the dialogue about why contemporary organizations are not especially good learners and about what is required to build learning organizations reveals some of the tools needed by communities and societies if they are to become more adept learners.

2

DOES YOUR ORGANIZATION HAVE A LEARNING DISABILITY?

Few large corporations live even half as long as a person. In 1983, a Royal Dutch/Shell study found that one-third of the firms that had been in the Fortune "500" in 1970 had vanished.[1] Shell estimated that the average lifetime of the largest industrial enterprises is less than forty years, roughly half the lifetime of a human being! Since then this study has been repeated by EDS and several other corporations, and served as a point of reference in James Collins' *Good to Great,* published in 2001. The chances are fifty-fifty that readers of this book will see their present firm disappear during their working career.

In most companies that fail, there is abundant evidence in advance that the firm is in trouble. This evidence goes unheeded, however, even when individual managers are aware of it. The organization as a whole cannot recognize impending threats, understand the implications of those threats, or come up with alternatives.

Perhaps under the laws of "survival of the fittest," this continual death of firms is fine for society. Painful though it may be for the

When those actions have consequences that come back to hurt us, we misperceive these new problems as externally caused. Like the person being chased by his own shadow, we cannot seem to shake them.

The "Enemy Is Out There" syndrome is not limited to assigning blame within the organization. During its last years of operation, the once highly successful People Express Airlines slashed prices, boosted marketing, and bought Frontier Airlines—all in a frantic attempt to fight back against the perceived cause of its demise: increasingly aggressive competitors. Yet, none of these moves arrested the company's mounting losses or corrected its core problem, service quality that had declined so far that low fares were its only remaining pull on customers.

For years American companies who had lost market share to foreign competitors blamed cheap foreign wages, labor unions, government regulators, or customers who "betrayed us" by buying products from someone else. "The enemy is out there," however, is almost always an incomplete story. "Out there" and "in here" are usually part of a single system. This learning disability makes it almost impossible to detect the leverage we can use "in here" on problems that straddle the boundary between us and "out there."

3. THE ILLUSION OF TAKING CHARGE

Being "proactive" is in vogue. Managers frequently proclaim the need for taking charge in facing difficult problems. What is typically meant by this is that we should face up to difficult issues, stop waiting for someone else to do something, and solve problems before they grow into crises. In particular, being proactive is frequently seen as an antidote to being "reactive"—waiting until a situation gets out of hand before taking a step. But is taking aggressive action against an external enemy really synonymous with being proactive?

Once, a management team in a leading property and liability insurance company with whom we were working got bitten by the proactiveness bug. The head of the team, a talented vice president for claims, was about to give a speech proclaiming that the company wasn't going to get pushed around anymore by lawyers litigating more and more claims settlements. The firm would beef up its own legal staff so that it could take more cases through to trial by verdict, instead of settling them out of court.

Then we and some members of the team began to look more systemically at the probable effects of the idea: the likely fraction of cases that might be won in court, the likely size of cases lost, the monthly direct and overhead costs regardless of who won or lost, and how long cases would probably stay in litigation. Interestingly, the team's scenarios pointed to increasing total costs because, given the quality of investigation done initially on most claims, the firm simply could not win enough of its cases to offset the costs of increased litigation. The vice president tore up his speech.

All too often, proactiveness is reactiveness in disguise. Whether in business or politics, if we simply become more aggressive fighting the "enemy out there," we are reacting—regardless of what we call it. *True proactiveness comes from seeing how we contribute to our own problems.* It is a product of our way of thinking, not our emotional state.

4. THE FIXATION ON EVENTS

Two children get into a scrap on the playground and you come over to untangle them. Lucy says, "I hit him because he took my ball." Tommy says, "I took her ball because she won't let me play with her airplane." Lucy says, "He can't play with my airplane because he broke the propeller." Wise adults that we are, we say, "Now, now, children—just get along with each other." But are we really any different in the way we explain the entanglements we find ourselves caught in? We are conditioned to see life as a series of events, and for every event, we think there is one obvious cause.

Conversations in organizations are dominated by concern with events: last month's sales, the new budget cuts, last quarter's earnings, who just got promoted or fired, the new product our competitors just announced, the delay that just was announced in our new product, and so on. The media reinforces an emphasis on short-term events—after all, if it's more than two days old it's no longer "news." Focusing on events leads to "event" explanations: "The Dow Jones average dropped sixteen points today," announces the newspaper, "because low fourth-quarter profits were announced yesterday." Such explanations may be true, but they distract us from seeing the longer-term patterns of change that lie behind the events and from understanding the causes of those patterns.

Our fixation on events is actually part of our evolutionary pro-

gramming. If you wanted to design a cave person for survival, ability to contemplate the cosmos would not be a high-ranking design criterion. What is important is the ability to see the saber-toothed tiger over your left shoulder and react quickly. The irony is that, today, the primary threats to our survival, both of our organizations and of our societies, come not from sudden events but from slow, gradual processes: the arms race, environmental decay, the erosion of a society's public education system, and decline in a firm's design or product quality (relative to competitors' quality) are all slow, gradual processes.

Generative learning cannot be sustained in an organization if people's thinking is dominated by short-term events. If we focus on events, the best we can ever do is predict an event before it happens so that we can react optimally. But we cannot learn to create.

5. THE PARABLE OF THE BOILED FROG

Maladaptation to gradually building threats to survival is so pervasive in systems studies of corporate failure that it has given rise to the parable of the "boiled frog." If you place a frog in a pot of boiling water, it will immediately try to scramble out. But if you place the frog in room temperature water, and don't scare him, he'll stay put. Now, if the pot sits on a heat source, and if you gradually turn up the temperature, something very interesting happens. As the temperature rises from 70 to 80 degrees F., the frog will do nothing. In fact, he will show every sign of enjoying himself. As the temperature gradually increases, the frog will become groggier and groggier, until he is unable to climb out of the pot. Though there is nothing restraining him, the frog will sit there and boil. Why? Because the frog's internal apparatus for sensing threats to survival is geared to sudden changes in his environment, not to slow, gradual changes.

The American automobile industry has had a long-standing case of boiled frog. In the 1960s, it dominated North American sales. That began to change very gradually. Certainly, Detroit's Big Three did not see Japan as a threat to their survival in 1962, when the Japanese share of the U.S. market was below 4 percent. Nor in 1967, when it was less than 10 percent. Nor in 1974, when it was under 15 percent. By the time the Big Three began to look critically

at their own practices and core assumptions, it was the early 1980s, and the Japanese share of the American market had risen to 21.3 percent. By 1990, the Japanese share was approaching 25 percent, and by 2005 it was closer to 40 percent.[2] Given the financial health of the U.S. car companies it is unclear whether this particular frog will ever regain the strength to pull itself out of the hot water.

Learning to see slow, gradual processes requires slowing down our frenetic pace and paying attention to the subtle as well as the dramatic. If you sit and look into a tidepool, initially you won't see much of anything going on. However, if you watch long enough, after about ten minutes the tidepool will suddenly come to life. The world of beautiful creatures is always there, but moving a bit too slowly to be seen at first. The problem is our minds are so locked in one frequency, it's as if we can only see at 78 rpm; we can't see anything at 33-1/3. We will not avoid the fate of the frog until we learn to slow down and see the gradual processes that often pose the greatest threats.

6. THE DELUSION OF LEARNING FROM EXPERIENCE

The most powerful learning comes from direct experience. Indeed, we learn eating, crawling, walking, and communicating through direct trial and error—through taking an action and seeing the consequences of that action; then taking a new and different action. But what happens when we can no longer observe the consequences of our actions? What happens if the primary consequences of our actions are in the distant future or in a distant part of the larger system within which we operate? We each have a "learning horizon," a breadth of vision in time and space within which we assess our effectiveness. When our actions have consequences beyond our learning horizon, it becomes impossible to learn from direct experience.

Herein lies the core learning dilemma that confronts organizations: *we learn best from experience but we never directly experience the consequences of many of our most important decisions.* The most critical decisions made in organizations have systemwide consequences that stretch over years or decades. Decisions in R&D have first-order consequences in marketing and manufacturing. Investing in new manufacturing facilities and processes influences quality and delivery reliability for a decade or more. Promoting the right people

into leadership positions shapes strategy and organizational climate for years. These are exactly the types of decisions where there is the least opportunity for trial and error learning.

Cycles are particularly hard to see, and thus learn from, if they last longer than a year or two. As systems-thinking writer Draper Kauffman, Jr., points out, most people have short memories. "When a temporary oversupply of workers develops in a particular field," he writes, "everyone talks about the big surplus and young people are steered away from the field. Within a few years, this creates a shortage, jobs go begging, and young people are frantically urged into the field—which creates a surplus. Obviously, the best time to start training for a job is when people have been talking about a surplus for several years and few others are entering it. That way, you finish your training just as the shortage develops."[3]

Traditionally, organizations attempt to surmount the difficulty of coping with the breadth of impact from decisions by breaking themselves up into components. They institute functional hierarchies that are easier for people to "get their hands around." But, functional divisions grow into fiefdoms, and what was once a convenient division of labor mutates into the "stovepipes" that all but cut off contact between functions. The result: analysis of the most important problems in a company, the complex issues that cross functional lines, becomes a perilous or nonexistent exercise.

7. THE MYTH OF THE MANAGEMENT TEAM

Striding forward to do battle with these dilemmas and disabilities is "the management team," the collection of savvy, experienced managers who represent the organization's different functions and areas of expertise. Together, they are supposed to sort out the complex cross-functional issues that are critical to the organization. What confidence do we have, really, that typical management teams can surmount these learning disabilities?

All too often, teams in business tend to spend their time fighting for turf, avoiding anything that will make them look bad personally, and pretending that everyone is behind the team's collective strategy—maintaining the appearance of a cohesive team. To keep up the image, they seek to squelch disagreement; people with serious reservations avoid stating them publicly, and joint decisions are watered-down compromises reflecting what everyone can live with,

3

PRISONERS OF THE SYSTEM, OR PRISONERS OF OUR OWN THINKING?

In order to see the learning disabilities in action, it helps to start with a laboratory experiment—a microcosm of how real organizations function, where you can see the consequences of your decisions play out more clearly than is possible in real organizations. For this reason, we often invite people to take part in a simulation called the "beer game," first developed in the 1960s at MIT's Sloan School of Management. Because it is a laboratory replica of a real setting, rather than reality itself, we can isolate the disabilities and their causes more sharply than is possible in real organizations. This reveals that the problems originate in basic ways of thinking and interacting, more than in peculiarities of organization structure and policy.

The beer game does this by immersing us in a type of organization which is rarely noticed but widely prevalent: a production/distribution system, the kind responsible for producing and shipping consumer and commercial goods in all industrial countries. In this case, it's a system for producing and distributing a single brand of

beer. The players at each position are completely free to make any decision that seems prudent. Their only goal is to manage their position as best they can to maximize their profits.[1]

As with many games, the playing of a single session of the beer game can be told as a story. There are three main characters in the story—a retailer, a wholesaler, and the marketing director of a brewery.[2] This story is told, in turn, through each players' eyes.

THE RETAILER

Imagine that you're a retail merchant. Perhaps you're the franchise manager of a brightly lit twenty-four-hour chain store at a suburban intersection. Or maybe you own a mom-and-pop grocery on a street of Victorian-era brownstones. Or a discount beverage outlet on a remote highway.

No matter what your store looks like, or whatever else you sell, beer is a cornerstone of your business. Not only do you make a profit on it, but it draws customers in to buy, perhaps, popcorn and potato chips. You stock at least a dozen different brands of beer, and keep a rough tally of how many cases of each are in your back room, which is where you keep your inventory.

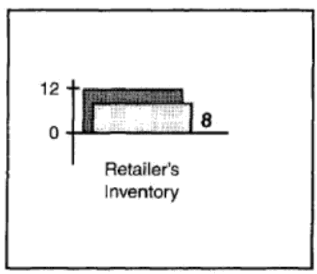
Once each week, a trucker arrives at the rear entrance of your store. You hand him a form on which you've filled in that week's order. How many cases of each brand do you want delivered? The trucker, after he makes his other rounds, returns your order to your beer wholesaler, who then processes it, arranges outgoing orders in a proper sequence, and ships the resulting order to your store. Because of all that processing, you're used to a four-week delay on average on your orders; in other words, a delivery of beer generally arrives in your store about four weeks after you order it.

You and your beer wholesaler never speak to each other directly. You communicate only through those check marks on a piece of paper. You probably have never even met him; you know only the truck driver. And that's for good reason: you have hundreds of products in your store. Dozens of wholesalers dole them out to you. Meanwhile, your beer wholesaler handles deliveries to several hundred stores, in a dozen different cities. Between your steady deluge of customers and his order-shuffling, who has time for chitchat? That single number is the only thing you need to say to each other.

One of your steadiest beer brands is called Lover's Beer. You are

dimly aware that it's made by a small but efficient brewery located about three hundred miles away from you. It's not a super-popular brand; in fact, the brewery doesn't advertise at all. But every week, as regularly as your morning newspaper deliveries, four cases of Lover's Beer sell from the shelves. Sure, the customers are young—most are in their 20s—and fickle; but somehow, for every one who graduates to Miller or Bud, there's a younger sister or brother to replace him.

To make sure you always have enough Lover's Beer, you try to keep twelve cases in the store at any time. That means ordering four cases each Monday, when the beer truck comes. Week after week after week. By now, you take that four-case turnover for granted; it's inextricably wedded to the image in your mind of the beer's performance. You don't even articulate it to yourself when placing the order: "Oh, yeah," runs the automatic litany. "Lover's Beer. Four cases."

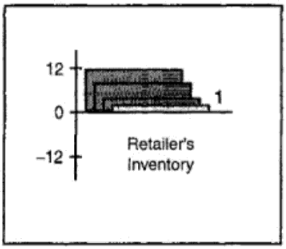


Week 2

Week 2: Without warning, one week in October (let's call it Week 2), sales of the beer double. They jump from four cases to eight. That's all right, you figure; you have an eight-case surplus in your store. You don't know why they've sold so much more suddenly. Maybe someone is having a party. But to replace those extra cases, you raise your order to eight. That will bring your inventory back to normal.

Week 3: Strangely enough, you also sell eight cases of Lover's Beer the *next* week. And it's not even spring break. Every once in a while, in those rare moments between sales, you briefly ponder the reason why. There's no advertising campaign for the beer; you would have received a mailing about it. Unless the mailing got lost, or you accidentally threw it out. Or maybe there's another reason . . . but a customer comes in, and you lose your train of thought.

At the moment the deliveryman comes, you're still not thinking much about Lover's Beer, but you look down at your sheet and see that he's brought only four cases this time. (It's from the order you placed four weeks ago.) You only have four cases left in stock, which means—unless there's a drop-back in sales—you're going to sell out all your Lover's Beer this week. Prudence dictates an order of at least eight cases to keep up with sales. Just to be on the safe side, you order twelve so you can rebuild your inventory.



Week 4

Week 4: You find time on Tuesday to quiz one or two of your younger customers. It turns out that a new music video appeared a month or so back on the popular cable television channels. The video's recording group, the Iconoclasts, closes their song with the line, "I take one last sip of Lover's Beer and run into the sun." You don't know why they used that line, but your wholesaler would have told you if there was any new merchandising deal. You think of calling the wholesaler, but a delivery of potato chips arrives and the subject of Lover's Beer slips your mind.

When your next delivery of beer comes in, only five cases of beer arrive. You're chagrined now because you have only one case in stock. You're almost sold out. And thanks to this video, demand might go up even *further*. Still, you know that you have some extra cases on order, but you're not sure exactly how many. Better order at least sixteen more.

Week 5: Your one case sells out Monday morning. Fortunately, you receive a shipment for seven more cases of Lover's (apparently your wholesaler is starting to respond to your higher orders). But all are sold by the end of the week, leaving you with absolutely zero inventory. Glumly, you stare at the empty shelf. Better order another sixteen. You don't want to get a reputation for being out of stock of popular beers.

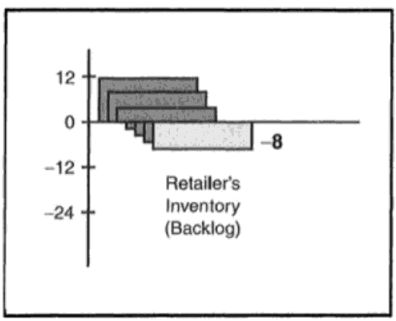
Week 6: Sure enough, customers start coming in at the beginning

of the week, looking for Lover's. Two are loyal enough to wait for your backlog. "Let us know as soon as it comes in," they say, "and we'll be back to buy it." You note their names and phone numbers: they've promised to buy one case each.

Only six cases arrive in the next shipment. You call your two "backlogged" customers. They stop in and buy their shares; the rest of the beer sells out before the end of the week. Again, two customers give you their names to call as soon as your next shipment arrives. You wonder how many more you could have sold had your shelves not been empty at the end of the week. Seems there's been a run on the beer: none of the stores in the area have it. This beer is hot, and it's apparently getting more popular all the time.

After two days of staring at the parched, empty shelf, it doesn't feel right to order any less than another sixteen cases. You're tempted to order more, but you restrain yourself because you know the big orders you've been placing will start to arrive soon. But when . . . ?

Week 7: The delivery truck brings only five cases this week, which means that you're facing another week of empty shelves. As soon as you fill your back orders, Lover's Beer is sold out again, this time within two days. This week, amazingly, five customers give you their names. You order another sixteen and silently pray that your big orders will start arriving. You think of all the lost potato chip sales.



Week 8

Week 8: By now, you're watching Lover's Beer more closely than any other product you sell. The suspense is palpable: every time a customer buys a six-pack of that quiet beer, you notice it. People seem to be talking about the beer. Eagerly, you wait for the trucker to roll in the sixteen cases you expect. . .

worth of Lover's Beer per week, and you still don't have it. By the end of last week, you had backlogged orders of another twenty-nine truckloads. Your staff is so used to fielding calls that they've asked you to install an answering machine devoted to an explanation about Lover's Beer. But you're confident that, this week, the twenty truckloads you ordered a month ago will finally arrive.

However, only six truckloads arrive. Apparently the brewery is still backlogged, and the larger production runs are only now starting to get shipped out. You call some of your larger chains and assure them that the beer they ordered will be coming shortly.

Week 10 is infuriating. The extra beer you were expecting—at least twenty truckloads' worth—doesn't show. The brewery simply couldn't ramp up production that fast. Or so you guess. They only send you eight truckloads. It's impossible to reach anybody on the phone down there—they're apparently all on the factory floor, manning the brewery apparatus.

The stores, meanwhile, are apparently selling the beer wildly. You're getting unprecedented orders—for twenty-six truckloads this week. Or maybe they're ordering so much because *they* can't get any of the beer from you. Either way, you have to keep up. What if you can't get any of the beer and they go to one of your competitors?

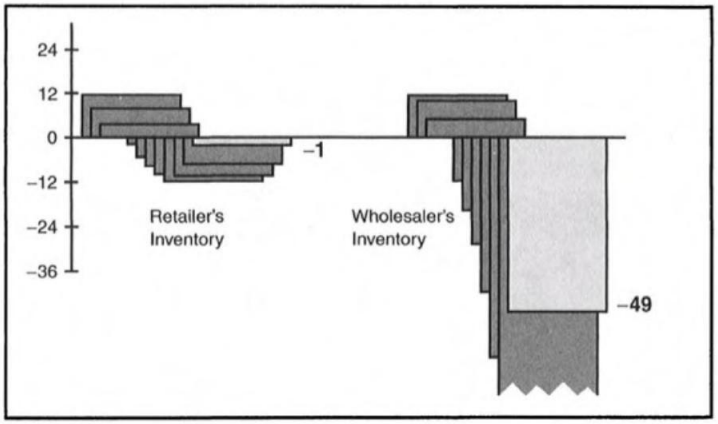
You order forty truckloads from the brewery.

In **Week 11,** you find yourself tempted to take extra-long lunches at the bar around the corner from your warehouse. Only *twelve* truckloads of Lover's Beer arrive. You still can't reach anybody at the brewery. And you have over *a hundred* truckloads' worth of orders to fill: seventy-seven truckloads in backlog, and another twenty-eight truckloads' worth of orders from the stores which you receive this week. Some of those backlog costs come due, and you're afraid to tell your accountant what you expect.

You've got to get that beer: you order *another* forty truckloads from the brewery.

By **Week 12,** it's clear. This new demand for Lover's Beer is a far more major change than you expected. You sigh with resignation when you think of how much money you could make if you only had enough in stock. How could the brewery have *done* this to you? Why did demand have to rise so *quickly?* How are you ever expected to keep up? All you know is that you're never going to get caught in this situation again. You order sixty more truckloads.

For the next four weeks, the demand continues to outstrip your supply. In fact, you can't reduce your backlog at all in **Week 13.**



Week 14

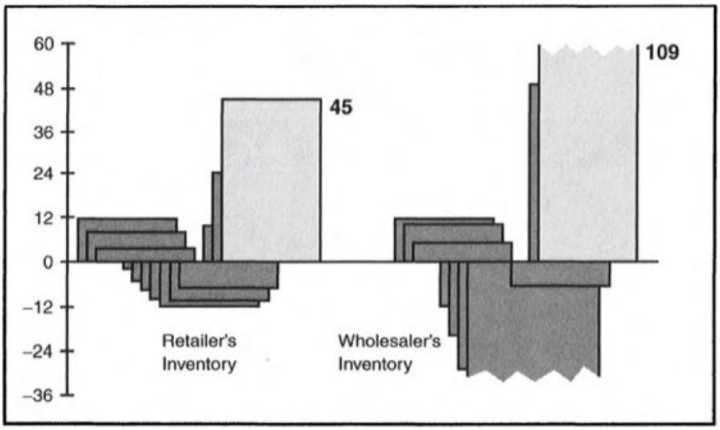
You finally start receiving larger shipments from the brewery in **Weeks 14 and 15.** At the same time, orders from your stores drop off a bit. Maybe in the previous weeks, you figure, they overordered a bit. At this point, anything that helps work off your backlog is a welcome reprieve.

And now, in **Week 16,** you finally get almost *all* the beer you asked for weeks ago: fifty-five truckloads. It arrives early in the week, and you stroll back to that section of the warehouse to take a look at it, stacked on pallets. It's as much beer as you keep for any major brand. And it will be moving out soon.

Throughout the week, you wait expectantly for the stores' orders to roll in. You even stop by the intake desk to see the individual forms. But on form after form, you see the same number written: zero. Zero. Zero. Zero. Zero. What's wrong with these people? Four weeks ago, they were screaming at you for the beer, now, they don't even want any.

Suddenly, you feel a chill. Just as your trucker leaves for the run that includes the brewery, you catch up with him. You initial the form, and cross out the twenty-four truckloads you had ordered, replacing it with a zero of your own.

Week 17: The next week, sixty more truckloads of Lover's Beer arrive. The stores still ask for—zero. You still ask for—zero. One hundred and nine truckloads of the stuff sit in your warehouse. You could bathe in the stuff every day, and it wouldn't make a dent.



Week 17

Surely the stores will want more *this* week. After all, that video is still running. In your brooding thoughts, you consign every retailer to the deepest corner of hell; the corner reserved for people who don't keep their promises.

And, in fact, the retailers once again order zero cases of Lover's Beer from you. You, in turn, order zero truckloads from the brewery. And yet, the brewery continues to deliver beer. Sixty more truckloads appear on your dock this week. Why does that brewery have it in for you? When will it ever end?

THE BREWERY

Imagine that you were hired four months ago to manage distribution and marketing at the brewery, where Lover's Beer is only one of several primary products. Yours is a small brewery, known for its quality, not its marketing savvy. That's why you were hired.

Now, clearly, you have been doing something right. Because in only your second month (Week 6 of this game), new orders began to rise dramatically. By the end of your third month on the job, you felt the satisfaction of getting orders for forty gross of beer per *week,* up dramatically from the four when you started. And you shipped out . . . well, you shipped out thirty.

Because breweries get backlogs too. It takes (in your brewery, at least) two weeks from the time you decide to brew a bottle of beer

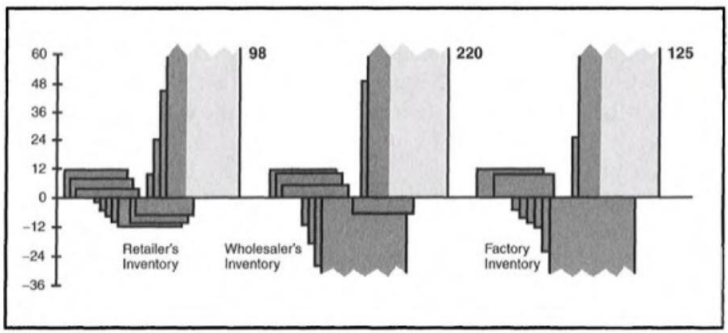
until the moment when that beer is ready for shipment. Admittedly, you kept a few weeks' worth of beer in your warehouse, but those stocks were exhausted by Week 7, only two weeks after the rising orders came in. The next week, while you had back orders for nine gross and another twenty-four gross in new orders, you could send out only twenty-two gross. By that time you were a hero within your company. The plant manager had given everyone incentives to work double-time, and was feverishly interviewing for new factory help.

You had lucked out with that Iconoclasts video mentioning the beer. You had learned about the video in Week 3—from letters written by teenagers to the brewery. But it had taken until Week 6 to see that video translate into higher orders.

Even by Week 14, the factory had *still* not caught up with its backlogged orders. You had regularly requested brew batches of seventy gross or more. You had wondered how large your bonus would be that year. Maybe you could ask for a percentage of the profits, at least once you caught up with back orders. You had even idly pictured yourself on the cover of *Marketing Week.*

Finally, you *had* caught up with the backlog in Week 16. But the next week, your distributors had asked for only nineteen gross. And last week, **Week 18,** they had not asked for any more beer at all. Some of the order slips actually had orders crossed out on them.

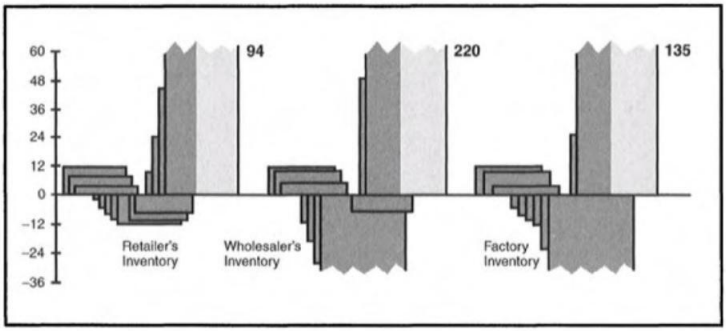
Now, it's **Week 19.** You have a hundred gross of beer in inventory. And the orders, once again, ask for virtually no new deliveries. Zero beer. Meanwhile the beer you've been brewing keeps rolling in. You place the phone call you've dreaded making to your boss. "Better hold off on production for a week or two," you say. "We've got"—



Week 21

and you use a word you've picked up in business school—"a discontinuity." There is silence on the other end of the phone. "But I'm sure it's only temporary," you say.

The same pattern continues for four more weeks: **Weeks 20, 21, 22, and 23.** Gradually your hopes of a resurgence slide, and your excuses come to sound flimsier and flimsier. Those distributors screwed us, you say. The retailers didn't buy enough beer. The press and that rock video hyped up the beer and got everybody sick of it. At root, it's the fickle kids—they have no loyalty whatsoever. How could they buy hundreds of cases one month, and nothing at all the next?



Week 24

Nobody misses you when you borrow the company car at the beginning of **Week 24.** Your first stop is the wholesaler's office. Not only is it the first time you have ever met face to face, it's only the second time you have ever spoken. There has never been anything to say until this crisis. You greet each other glumly, and then the wholesaler takes you out to the back warehouse. "We haven't gotten an order for your brand in two months," says the wholesaler. "I feel completely jerked around. Look! We still have 220 truckloads here."

What must have happened, you decide together, is that demand rose rapidly, and then fell dramatically. Another example of the fickleness of the public. If the retailers had stayed on top of it and warned you, this would never have happened.

You are working over the phrasing of a marketing strategy report in your mind on the way home when, on a whim, you decide to stop at the store of a retailer you pass along the way. Fortuitously, the owner of the store is in. You introduce yourself and the retailer's

pant made well-motivated, clearly defensible judgments based on reasonable guesses about what might happen. There were no villains, but there was a crisis nonetheless—built into the structure of the system.

In the last twenty years, the beer game has been played thousands of times in classes and management training seminars. It has been played on five continents, among people of all ages, nationalities, cultural origins, and vastly varied business backgrounds. Some players had never heard of a production/distribution system before; others had spent a good portion of their lives working in such businesses. Yet every time the game is played the same crises ensue. First, there is growing demand that can't be met. Orders build throughout the system. Inventories are depleted. Backlogs grow. Then the beer arrives en masse while incoming orders suddenly decline. By the end of the experiment, almost all players are sitting with large inventories they cannot unload—for example, it is not unusual to find brewery inventory levels in the hundreds overhanging orders from wholesalers for eight, ten, or twelve cases per week.[3]

If literally thousands of players, from enormously diverse backgrounds, all generate the same qualitative behavior patterns, the causes of the behavior must lie beyond the individuals. The causes of the behavior must lie in the structure of the game itself.

Moreover beer game-type structures create similar crises in real-life production-distribution systems. For instance, in 1985, personal computer memory chips were cheap and readily available; sales went down by 18 percent and American producers suffered 25 to 60 percent losses.[4] But in late 1986 a sudden shortage developed and was then exacerbated by panic and overordering. The result was a 100 to 300 percent increase in prices for the same chips.[5] A similar surge and collapse in demand occurred in the semiconductor industry in 1973 to 1975. After a huge order buildup and increases in delivery delays throughout the industry, demand collapsed and you could have virtually any product you wanted off any supplier's shelf overnight. Within a few years, Siemens, Signetics, Northern Telecom, Honeywell, and Schlumberger all entered the business by buying weakened semiconductor manufacturers.[6]

In mid-1989, General Motors, Ford, and Chrysler, as the May 30 *Wall Street Journal* put it, "were simply producing far more cars than they were selling, and dealer inventories were piling up . . . The companies already are idling plants and laying off workers at rates not seen for years."[7] Entire national economies undergo the same

sorts of surges in demand and inventory overadjustments, due to what economists call the "inventory accelerator" theory of business cycles.

Similar boom and bust cycles continue to recur in diverse service businesses. For example, real estate is notoriously cyclic, often fueled by speculators who drive up prices to attract investors to new projects. "The phone would ring," Massachusetts condominium developer Paul Quinn told the *MacNeil-Lehrer Newshour* in 1989, "in our offices, and we said 'How are we going to handle this? We'll tell everybody to send in a $5,000 check with their name and we'll put them on the list.' The next thing we knew, we had over 150 checks sitting on the desk." The glut followed quickly on the boom: "It was a slow, sinking feeling," Quinn said, interviewed in a seaside town full of unsold developments. "Now's the time to start building for the next boom. Unfortunately, the people in the real estate industry are too busy trying to address the problems they have left over from the last one."[8]

In fact, reality in production-distribution systems is often worse than the beer game. A real retailer can order from three or four wholesalers at once, wait for the first group of deliveries to arrive, and cancel the other orders. Real producers often run up against production capacity limits not present in the game, thereby exacerbating panic throughout the distribution system. In turn, producers invest in additional capacity because they believe that current demand levels will continue into the future, then find themselves strapped with excess capacity once demand collapses.

The dynamics of production-distribution systems such as the beer game illustrate the first principle of systems thinking:

STRUCTURE INFLUENCES BEHAVIOR

When placed in the same system, people, however different, tend to produce similar results.

The systems perspective tells us that we must look beyond individual mistakes or bad luck to understand important problems. We must look beyond personalities and events. We must look into the underlying structures which shape individual actions and create the conditions where types of events become likely. As Donella Meadows expresses it:

> A truly profound and different insight is the way you begin to see that the system causes its own behavior.[9]

This same sentiment was expressed over a hundred years ago by a systems thinker of an earlier vintage. Two thirds of the way through *War and Peace,* Leo Tolstoy breaks off from his narrative about the history of Napoleon and czarist Russia to contemplate why historians, in general, are unable to explain very much:

> The first fifteen years of the nineteenth century present the spectacle of an extraordinary movement of millions of men. Men leave their habitual pursuits; rush from one side of Europe to the other; plunder, slaughter one another, triumph and despair; and the whole current of life is transformed and presents a quickened activity, first moving at a growing speed, and then slowly slackening again. What was the cause of that activity, or from what laws did it arise? asked the human intellect.
>
> The historians, in reply to that inquiry, lay before us the sayings and doings of some dozens of men in one of the buildings in the city of Paris, summing up those doings and sayings by one word—revolution. Then they give us a detailed biography of Napoleon, and of certain persons favorably or hostilely disposed to him; talk of the influence of some of these persons upon others; and then say that this it is to which the activity is due; and these are its laws.
>
> But, the human intellect not only refuses to believe in that explanation, but flatly declares that the method of explanation is not a correct one . . . The sum of men's individual wills produced both the revolution and Napoleon; and only the sum of those wills endured them and then destroyed them.
>
> "But whenever there have been wars, there have been great military leaders; whenever there have been revolutions in states, there have been great men," says history. "Whenever there have been great military leaders there have, indeed, been wars," replies the human reason; "but that does not prove that the generals were the cause of the wars, and that the factors leading to warfare can be found in the personal activity of one man. . . ."[10]

Tolstoy argues that only in trying to understand underlying "laws of history," his own synonym for what we now call systemic structures, lies any hope for deeper understanding: