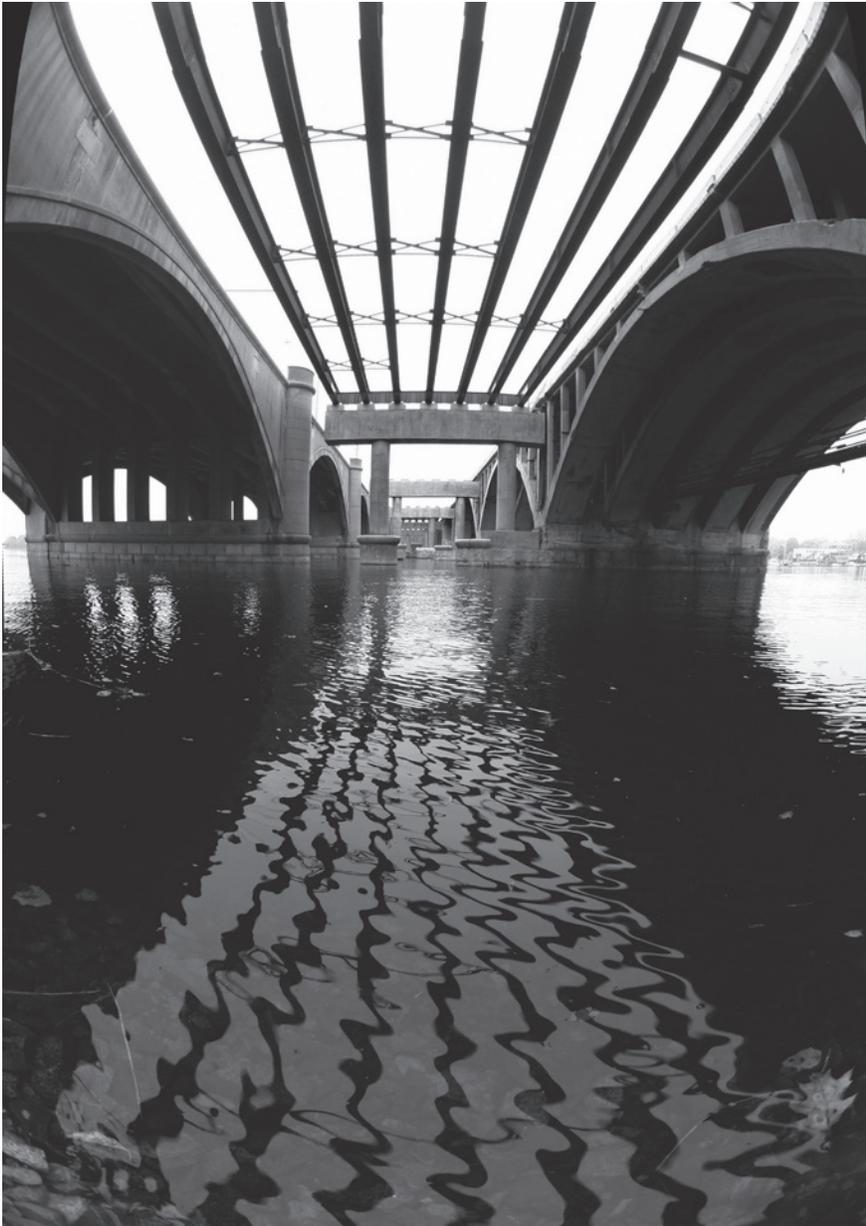


Reflections

The SoL Journal
on Knowledge, Learning, and Change



ISTOCK

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BOOK EXCERPT

The Managerial Moment of Truth

Bruce Bodaken, Robert Fritz

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C. Sherry Immediato

A KEY PREMISE OF A LEARNING COMMUNITY is that other people's experiences provide a source of insight and perspective that can better help us achieve the results we desire. Typically, we assume that we can improve our performance by copying the behavior that produces the accomplishments we admire. But we need only look at the many frustrated attempts to replicate the Toyota production system to know that while imitation may be the sincerest form of flattery, it does not reliably produce either results or learning. Why? And how can we redirect these well-intentioned efforts to gain the knowledge that we seek?

In this issue of *Reflections*, we have assembled a group of articles that speak to the broader issue of performance improvement, and how we can effectively learn from others.

"The Thinking Production System" by Michael Ballé, Godefroy Beauvallet, Art Smalley, and Durward K. Sobek directs our attention to the purposes that underlie the Toyota approach (TPS). According to practitioners of TPS, implementing lean practices will only produce the desired results if managerial aims are consistent with the methods. One practitioner describes the primary aim as drawing out people's capability and motivation. That's a little different than driving out cost. The authors hope that by framing the change to be implemented primarily as a "thinking" system, we will appreciate that the work of management is about "frame control" and producing a supportive context for new tools and methods. They offer illustrations of how frame control can be both taught and learned. Plug Power CEO Roger Saillant shares his own experience as a practitioner in the accompanying commentary.

SoL research member George Roth has studied lean enterprises extensively. He observes that the gains associated with these efforts have been achieved by practices that are not emphasized in current change management frameworks, and therefore might be overlooked by the frame-bound observer. "Distributing Leadership Practices for Lean Transformation" describes in-depth one of the five capabilities – rethinking organizational boundaries, installing innovations in sets, pushing and pulling change, seeking growth opportunities, and distributing leadership practices – that are effectively integrated in creating lean systems. Long time lean practitioner Bill Bellows from Pratt & Whitney Rocketdyne offers a commentary on Roth's findings.

Feedback and reward systems have always presented a particular challenge in effectively implementing a performance-oriented culture. Bahattin Aydin and members of the Ulker Star Team have provided a case study of their experience in designing and implementing a performance feedback system. "From Human Resources to Human Relations" documents the transformation of the company performance management system from bureaucratic paperwork to meaningful interaction. The case also documents the team's learning journey, including a systems thinking analysis of the design and implementation issues they faced. A consultant to this effort, Evrim Calkaver, a coordinator for SoL's local community in Turkey, authors a commentary.

A second case study is offered by SoL member Peter Pruyn and Michael Sterling of the United Space Alliance. In “Space Flight Resource Management: Lessons Learned from Astronaut Team Learning” the authors’ intent is to document their specific case as well as to provide the reader with a toolbox with which to build their own team learning and group decision-making curriculum.

This issue’s book excerpt is from *The Managerial Moment of Truth*. Bruce Bodaken, CEO of health care insurer Blue Shield of California, and Robert Fritz have been collaborating for a number of years to develop a method to use the opportunities for performance improvement that surface every day. Using the concept of creative tension, they reframe the conversations we have when we’ve gotten off track relative to desired results. We feature the preface to this work.

Many SoL members have noted how much Marilee Adams’ practical guidance on how to inquire more deeply has helped them change their frames. Lee Salmon provides a review of Adams’ most recent work, *Change Your Questions, Change Your Life*.

Finally, we are delighted when readers write! Reflections from SoL research member Mary Ann Allison describe a way to frame the teamwork underlying successful hastily configured networks (HFNs) described in our last issue.

We also want to alert you to the following recent publications by SoL members and friends:

- *Artful Leadership: Awakening the Commons of the Imagination* by Michael Jones. Go to <http://www.pianoscap.es.com> for more information and to order copies of the book and accompanying music CD. (Michael published an earlier article in *Reflections* when he was developing this book – see: *Reflections* Vol. 4, No. 3.)
- *Learning Organization Journey – A Success Story* (Turkish) by Evrim Çalkavur. Go to <http://www.evrimgalkavur.com> (See Evrim’s commentary in this issue.)
- *Three Deep Breaths* by Thomas Crum. Go to <http://www.aikiworks.com/>. Thomas Crum’s work has provided inspiration for many of the physical embodiment exercises used in SoL courses. His latest work is an allegory offering simple practices for returning to one’s center.

Upcoming issues of *Reflections* will be organized around sustainability, systems thinking and new developments in the theory and practice of organizational learning. We invite both your submissions and requests. And in the spirit of this issue, your suggestions about how we can better meet your needs are always welcome and appreciated. We look forward to hearing from you.



C. Sherry Immediato
Managing Director, SoL

HASTILY FORMED NETWORKS AND GROUPS OF PURPOSE

I'D LIKE TO THANK AUTHORS PETER DENNING AND TRACY HUSTON for their powerful work on hastily formed networks (HFNs) in *Reflections 7.1*, and use this opportunity to connect their findings with several other *Reflections* articles and some of the things I have been observing and thinking about in my research on groups of purpose and systemic social change.

Two questions that HFNs raise for me are:

- What defines and holds groups of people together and how has this changed over time?
- How visible and compelling are various types of goals or purposes around which groups might form?

Before the Industrial Revolution, most people lived in small villages. Everyone knew everyone else. People were born, lived, and died in a “ready-made” group or community; groups were defined by a geographic place. The land, shared customs, and the comparatively- simple hierarchical power of village and family patriarchs held people together.

After the Industrial Revolution, villages grew larger and many people lived in cities. Even those who didn't live in cities moved more frequently. People didn't know everyone else in their locale. Local geography no longer provided ready-made groups into which people were born, where becoming a group member was “automatic” and where everyone worked together “naturally.” People began to spend most of their time and attention in new types of groups – bureaucracies – where group membership is granted by the organization in question. For example, business organized as bureaucracies make hiring decisions; if the business doesn't hire you, you are not part of that group. Even if you live a country (and in some cases, even if your family has lived in that country for generations), if the government bureaucracy doesn't recognize you as citizen, you are not part of that nation-state's citizen group. Bureaucratic groups are typically held together by complex top-down hierarchical power, which often comes in both carrot and stick form. Businesses pay salaries and offer learning and accomplishment (carrots) and fire people who do not perform (stick). Countries extend protection, infrastructure, and rights (carrots) while fining and jailing people who don't obey their laws (stick).

While most of us still spend most of our time in bureaucratic groups, with increasing frequency, many of us take part in a new type of group – not a village group bound by geography and simple hierarchy nor a bureaucratic group bound by formal processes and complex hierarchy – but a group formed when individuals recognize a shared commitment to a purpose. With no geography and little or no hierarchy to hold the group together, these groups exist only as long as their individual members are committed enough to the shared purpose to work together. (See Sandow and Allen, *Reflections 6.2*.) When the commitment fades, so does the group. I call these groups *groups of purpose*. HFNs are one example; SOL is another and quite different example. Some communities of practice are groups of purpose; others are not. The difference lies in whether the group actually *does something as a group* in the world as opposed to sharing information and learning which is applied individually.

The Information Revolution – as powerful as the Industrial Revolution – is triggering a systemic change throughout society. As measured by the World Economic Forum at Davos, public trust in our essential bureaucracies – national governments, the United Nations, and global companies – is low and

declining rapidly. This isn't because these institutions, or the people in them, are inherently bad but because the form of organization is not suited to this environment. At the SOL conference in Vienna last year and reported in *Reflections* (*Reflections* 6.7), French sociologist Alain de Vulpian, described how, in the process of developing a new society, "ordinary people are becoming more autonomous" (p. 82). As hierarchy loses its ability to hold groups together, families, business, and governments naturally change.

We should expect to be – and are – seeing changes in group form. Bureaucracies were suited to the Industrial Age; groups of purpose are emerging to function effectively in the Information Age where we are immersed in electronic communications and information and the situation changes minute by minute. In 1750 England, it would have been difficult, if not impossible, to see in a small, dark spinning factory the roots of global businesses. Based on more than twenty years of research which models social change over centuries, I feel confident in comparing HFNs, SOL, and other groups of purpose to those

Key Factors in Group Attention and Cohesion Arising from Various Types of Purposes

TYPE OF GROUP PURPOSE/ EXAMPLE	CHARACTERISTICS OF PURPOSE	LEVEL OF SHOCK AND HIGH STRESS	VISIBILITY OF THE NEED AND/OR PURPOSE	TYPICALLY ADDRESSING MASLOW LEVEL	RESPONSE TIME REQUIRED	TIME GROUP PERFORMANCE TO BE SUSTAINED
Hastily Formed Network formed to meet an emergency	Shared purpose is visible and immediate – if not always well understood or articulated	High (reduces performance)	Highly visible but perception often incomplete	1 Sometimes 2	Immediate	Hours, days, weeks
The individuals and organizations who responded to the 9/11 attacks			"The cave bear is attacking; we kill it or die."	Important for survival of self and/or others		
Self-organized work groups housed in a bureaucracy	Often housed in organizational goals; shared understanding	Medium (makes call to action more difficult to sustain; but tying response to compensation and accomplishment helps)	Brought into visibility by seeing the organization's goals in the context of competition	2 3 Sometimes 4	Weeks, months, Years	Weeks, months, years
An emergent Nissan work group "creating the future we want"						
Group with medium to long-term intentions not related to immediate survival	Generated by individuals who come together around shared purpose; the purpose is often difficult to explain to others	Low (makes call to action more difficult to sustain)	Often difficult to see or understand	3 4 Sometimes 5	Years	Years
The Society for Organizational Learning			"We are like the frog who slowly boils to death in increasingly hot water."			

early Industrial factories and identifying them as early stages of the type of group which will come to characterize the Information Age.

Potentially immensely powerful but also sometimes very fragile, groups of purpose are held together by shared purpose, which leads to my second question: How visible and compelling are various types of goals or purposes around which groups might form?

To help us think about purposes, I invite two guests: a cave bear and a frog. Let's start with the cave bear. We are all descended from those who were able to kill or get out of the way of an attacking cave bear. Our senses, our attention, and our ability to cooperate are finely honed to make sense of and respond to immediate danger. We are very clear about the dangers of an angry cave bear. Even if our response is not as fully perceptive, nuanced, and collaborative as it might once have been, those of us who survive have embedded in our being an ability to recognize and collaborate to respond to immediate danger. The frog, on the other hand, is that proverbial frog described in so many training programs that doesn't have a nervous system which is good at noticing very gradual changes in temperature. As the story goes, a frog dropped into hot water will immediately jump out but, if induced to sit in a pot of water which is heated very slowly, will not notice the changes and may very well be boiled to death.

For HFNs, often the shared purpose is like the cave bear – visible, immediate, and compelling – if not always well understood or articulated. This visibility often carries with it a high level of shock which reduces our ability to think clearly and a very limited time to reflect and organize thoughtfully. On the other hand, typically the group does not need to sustain itself over long periods of time.

On the other hand, SoL, for instance, is self-organized around a purpose which, while very compelling to a few people, is often difficult to explain to others. Unlike 9/11, where the need was clear and compelling, many people either don't see the need “to discover, integrate and implement theories and practices for the interdependent development of people and their institutions” or, even if they do see the need, do not place it high enough in their list of priorities. While SOL has the time to be thoughtful, engage in practice, and developing collaborative trust over time, it is more difficult to sustain focus on goals or purposes which do not appear related to more immediate and pressing matters.

It seems to me that self-organized work groups at Nissan fall somewhere in between these two examples. I've summarized some of my thinking in the following table and invite readers to send me their comments, examples, and questions.

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The Thinking Production System

Michael Ballé, Godefroy Beauvallet, Art Smalley, Durward K. Sobek



Michael Ballé



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Durward K. Sobek

Toyota Motor Corporation no longer needs an introduction. The spectacular success of Toyota in the last few years, combined with the no less spectacular problems of western automakers, has propelled Toyota from an isolated curiosity within one industry to a model of world-class design, development and manufacturing. Much of its success is attributed to its now fabled Toyota Production System (TPS), dubbed lean manufacturing (or simply, “lean”) in Womack, Jones and Roos’ ground-breaking book, *The Machine That Changed the World*.¹ Since that time, TPS has been extensively studied with dozens of books and articles describing the system and its tools and techniques, and promising significant gains in efficiency, quality and on-time delivery. Numerous authors have described successful lean transformations². Toyota itself has contributed significantly to the diffusion of its model, because they need their local suppliers to perform at the same high level if they want to reproduce their success outside of Japan. Indeed, lean is now being applied across broad sectors of the economy, from logistics to healthcare³ to building construction⁴ to services.⁵

And yet, though many corporate players have endeavored to “go lean,” few have succeeded beyond reaping the low-hanging fruits. Hajime Ohba, head of the Toyota Supplier Support Center, recently commented, “Many firms have doubled productivity in the short run, but few have been able to evolve by continuing to apply the principles of TPS.”⁶ Similarly, in the authors’ experience, despite the increasing armies of internal and independent consultants en route to turning lean consultancy and training into an industry of its own, truly lean enterprises as defined by Womack and Jones⁷ are rare.

In today’s environment of global competition and intense cost pressures, the low rate of successful lean transformation is worth investigation. At first, explanations about the difficulties of implementing lean in western companies were about culture. But, as Toyota transplants have shown that TPS can perform equally well in the U.S. or Europe as it does in Japan, the culturalist argument gave way to a “lack of leadership” thesis. But even that is not very satisfying as, clearly, companies in the automotive industry and elsewhere have taken lean very seriously. They’ve created lean-VPs, invested in lean offices staffed with lean officers, and driven their lean programs hard. Thus, the failure to realize the full promise of lean does not seem to be due to lack of initiative or effort – something else is at work.

We believe deep frames pervade TPS that fundamentally alter how the system is understood and therefore how to proceed with implementation. “Frames,” or “frameworks” are the mental constructs through which we see, interpret and act on the world. Furthermore, we argue that if lean tools (such as kanban, SMED, 5S, TPM, poka-yoke, etc.) are applied without “frame control,” the results will be disappointing beyond gathering the obvious low-hanging fruit. If managers and program leaders fail to understand the frameworks underlying TPS, they consequently miss the point of the tools and therefore fail to achieve the expected results. The fact is, TPS masters continually harp on issues of frame control (making sure the

tools are applied in the right perspective), but few seem to pay much heed. The good news, though, is frame control can be taught, and thereby significantly improve the effectiveness of lean programs. Indeed, the implementation implications of better understanding the framing of TPS are significant, and open the way for another approach to lean implementation.

Framing the Toyota Production System

Framing is a well-studied concept in social science. It can be described as implicitly selecting some aspects of perceived reality as more salient than others, thus orienting problem definition, causal interpretation, moral evaluation and eventually action recommendation. Framing, then, explains why the same events can be interpreted very differently depending on the observer's framework. Framing can be thought of as, literally, looking at a situation through a picture frame and focusing on some aspects, while completely missing others.

The lean movement has been responsible for changing some frames in the industrial world. For instance, large inventories, which were once viewed as healthy assets that could be tapped when needed, are now generally seen as sources or symptoms of waste. Large batches produced to fulfill "economic order quantities" are increasingly unacceptable as a result of a new framework for seeing inventory. Toyota's expertise in creating level flow of goods through a "pull" manufacturing system has changed the frame by demonstrating that the real issue was reduction of inventory, rather than the management of it. For instance, an expensive Texas Instrument (now Raytheon) automated warehouse was scrapped before reaching full production when it was realized that the real issue was to reduce inventories rather than build ever-more efficient warehouses.⁸ In this case, reframing led TI executives to focus on the causes of excessive stock and how it should reduce inventories rather than building ever-more efficient warehouses.

Today the true promise of lean can be realized through a shift in how executives frame this system. Most western efforts at implementing lean are about, in one way or another, *applying lean tools to every process* in the company. This would seem logical enough to most western thinkers. This approach eliminates waste, improves quality, and leads to greater profits over time. Who can argue with this? But Toyota's own TPS masters have a different take. As TPS veteran Teruyuki Minoura⁹ explains, the "T" in TPS stands for "Thinking." To him, TPS is about creating "an environment where people have to think [which] brings with it wisdom, and this wisdom brings with it kaizen (continuous improvement)." Nampachi Hayashi,¹⁰ a Toyota Executive Advisory Engineer and disciple of the legendary Taiichi Ohno, argued that the essence of TPS is developing within in each employee a "kaizen consciousness." TPS master Hajime Ohba, quoted earlier, attributes the difficulties of transferring lean to a failure to apply TPS as a "system of training." In other words, TPS masters view lean transformation from a different frame: *changing the thought processes of every employee*.

Going lean, then, is less about "leaning out" every business process or applying finely tuned tools to achieve a certain lean aesthetic, and more about improving organizational performance, seeing problems, solving them the "right" way, and in doing so continually increasing the intellectual capacity and skill of all members of the organization. Why is this important? As we explain in the following pages, the "apply lean tools to every process" frame is inherently limited. Such an approach can spark real gains – yet these improvements are often isolated, blind to the waste they cause elsewhere in the system, and invariably doomed to wane when the key players move on or another fad sweeps the workplace. On the



other hand, tapping and evolving the creativity of every employee, if properly cultivated and directed, has unlimited potential. This enables the core principle of lean – *kaizen* – to take root at the genetic level so that learning becomes an organic process of operations. Realizing the full promise of this thinking production system requires a shift to this learning frame.

We expose this fundamental difference in perspectives by identifying four deep frames that pervade the TPS. It's important to learn how to recast one's understanding of commonly "understood" lean practices with the following frames: *performance mindset, problem awareness, solving problems the "right" way, and developing people through problem-solving.*

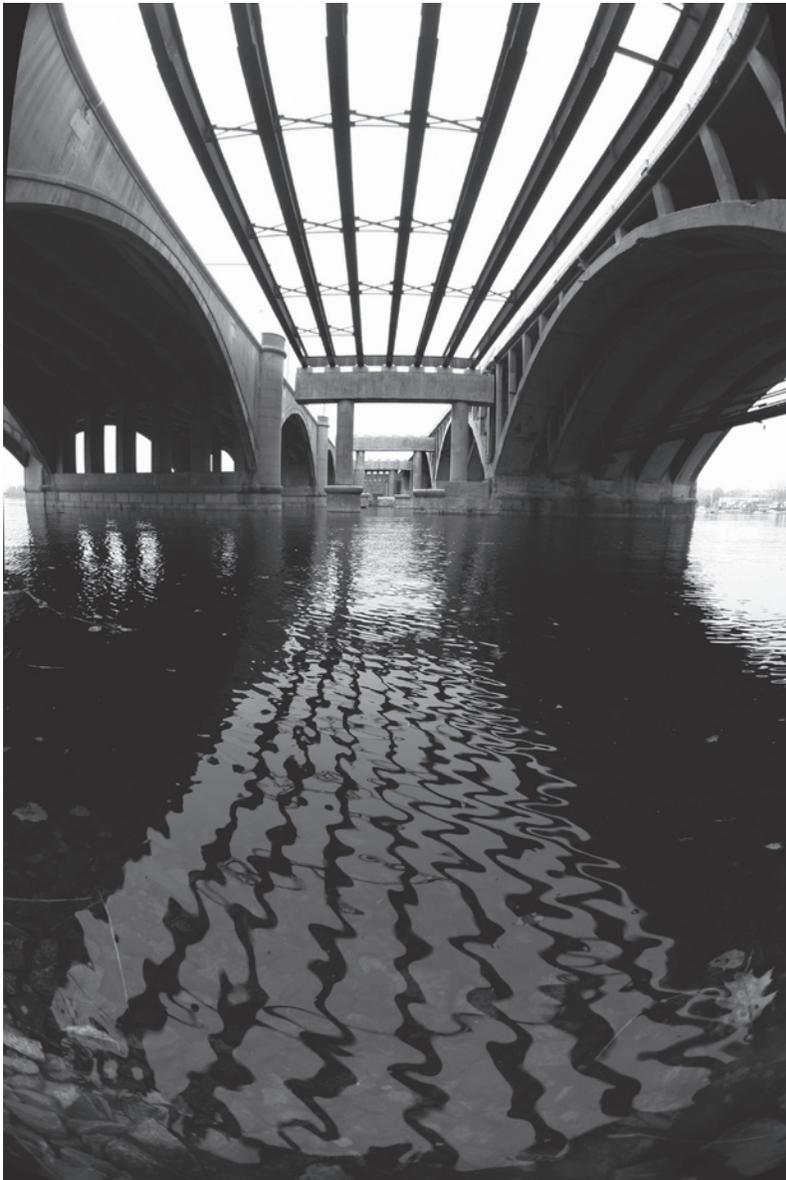
Improving Performance: Quality, Cost and Lead-Time Reduction

Improving performance is the first goal of TPS, not implementing tools for the tools' sake. Improving performance is explicitly framed as:

- *Quality improvement* through building in quality 100% at the process rather than inspecting it in later.
- *Improving customer service by reducing response time:* how can I please my customers by delivering to them exactly what they want, exactly when they want it, in the right quantity at the highest quality and the lowest cost?

- *Cost reduction through waste elimination:* anything other than the minimum amount of equipment, materials, parts and working time absolutely essential to production are merely surpluses that only raise cost.

Missing the deep “performance improvement” frame can lead to self-defeating outcomes. For instance, one of the authors, who worked several years for Toyota in Japan and was trained in the plant where Taiichi Ohno initially tested many of the TPS tools, agreed to help a U.S. based company with the implementation of TPS principles in a low volume, high mix machine intensive shop where others were having no real luck. After discussion and analysis it was decided with management that improving on-time delivery, reducing inventory, and improving productivity were key goals that mattered over the next year. Furthermore, from his observations and discussions, he determined that on-time delivery problems were due to an incorrect mix of components coming from the critical pacemaker machining processes. Over the following weeks and months, the author advised the plant personnel in improving



set-up times, reducing batch sizes, and reducing lost production time on specific machines through cross-training among other improvements. As a result, plant employees discovered the main problems in each the key areas, devised countermeasures, and implemented them on a trial basis as necessary. A year later, the most problematic plant in the division was now shipping almost 100% on-time with one third less inventory, and labor productivity was up 15% or more. As a result of the improved shipping performance, organic growth, and other key improvement activities, sales were increased and profits as measured by return on sales were up nearly six percentage points from a year earlier.

The division managers and plant staff expected to receive internal accolades for their improved performance. Sadly, however, they were in for a rude awakening. Despite its recent performance improvements, the plant scored among the lower performers in the entire company on a standard lean survey audit that measured adherence to tools. The reasons cited were that the value stream maps and tracking center did not follow the internal standard, all

machines did not have standardized work charts, and the way visual control was implemented also was not the method the central function wanted, etc. In other words the corporate auditors had a very different frame than that of the plant and our author-consultant. Despite the tremendous improvement in performance and customer satisfaction, the corporate “apply lean tools to every process” frame lead them to view the plant’s lean progress as not up to snuff and deserving of a dressing down – which it disappointingly received.

Problem Awareness: Developing a Kaizen Consciousness

The second deep frame of TPS is problem awareness, in which lean thinkers continually know precisely where the system falls short of perfection and relentlessly pursue these “problems” every day. In the words of Nampachi Hayashi: “the biggest problem is thinking you are okay.” A general, and understandable, human tendency is to blame circumstances when we run into difficulties. The TPS frame looks to take responsibility, challenge assumptions and conduct the famed “5 Why” exercise of asking “Why?” until the root cause of a problem is uncovered. Steven Spear and H. Kent Bowen describe¹¹ a harrowing session when a TPS master asked a group working on tool change reduction why they had not achieved the five-minute goal they had originally established, even though they had reduced the changeover time by 50%. The group offered explanations to do with machine complexity, technical difficulties and equipment upgrade cost. The TPS sensei responded to these replies with more questions, and pushed the group members to challenge their assumptions on the smallest details. Spear and Bowen assert that the sensei was not suggesting the team had failed, but that he was trying to get them to realize that they had not fully explored all their improvement opportunities because they had not questioned their assumptions deeply enough. They thought they were okay because they had achieved the “easy” 50% reduction.

Because confronting problems is a strongly embedded frame of TPS, managers learn to avoid their natural urge to “work-around” a problem with a quick fix, and instead sort out the fundamental issue. That’s why TPS masters say “No problem is a problem.” For example, one of the authors recently toured a 1,000-person Toyota engine plant in West Virginia that manufactures over a half million small engines and transmissions annually. The plant has won the prestigious Harbor award for four years running in North America as the most efficient engine plant in the U.S, which numbers for inventory, scrap, defects, downtime and safety problems that stand up to, and in some cases exceeds, the operating metrics of its sister plants in Japan. The overall design of the plant down to the minutest details was well thought out. The workforce was bright, multi functional, and highly engaged.

Yet despite being perhaps the best Toyota engine plant in the world, management’s mindset was focused solely on further improvement opportunities. On each production line, the respective team leader pointed out the precise details of the top five quality problems, the top ten downtime machines in terms of frequency and intensity, the most likely potential causes for accidents in their area, not to mention the two top reasons for some real or perceived minor decline in worker morale. Everyone was focused on exactly how to get another 10%

A general, and understandable, human tendency is to blame circumstances when we run into difficulties. The TPS frame looks to take responsibility, challenge assumptions and conduct the famed “5 Why” exercise of asking “Why?” until the root cause of a problem is uncovered.

productivity improvement in the upcoming year. This mindset was problem awareness to the fifth degree.

Problem-Solving: Go and See, Quick Experiments and Rigorous Results Checking

Thirdly, TPS also conveys a deep-frame for experiential problem-solving. As Ohno once said¹², “in a production plant operation, data are highly regarded – but I consider facts to be even more important.” The difference is more than semantic: TPS considers facts to be events that you have yourself witnessed at the real place, with the real parts and the real people. Questions are not abstract exercises but real shop floor experiments that highlight the problem and uncover the flaws through many iterations. Indeed, many of the most famous TPS “tools” such as SMED, flow-and-layout, and others, are nothing but observation practices that permit a hands-on understanding of the issues, and therefore a concrete resolution. Masters seek clear explanations instead of quick “solutions.”

One of us witnessed this frame early in his career as an engineering trainee at Toyota. A particular grinding process was producing between 2-3% scrap, which was ten times the current “acceptable” amount for that type of machine. After studying various data at his desk all morning without arriving at any insight as to the cause of the problem, he was asked by his supervisor to go stand in front of the machine for an hour and then report back. Upon doing so the trainee felt no closer to solving the problem than he had in the morning. The supervisor then suggested that the trainee draw out the grinding process in excruciating detail and then list all the potential things that could be affecting the quality of the part on a flip chart. After about 15 things were listed and accepted as potential causes, the trainee was told to devise a test for each of them, carry them out only one at a time, and report back his findings after each one. The tests involved grinding wheel speed changes, wheel in-feed changes, dressing wheel changes, clamping changes, cycle time changes, coolant amount, and other variables that each took a couple hours to ready and involved much begging of help from either the operator or maintenance.

The first eight experiments took two days to complete and did not resolve the problem but did importantly clarify cause and effect of certain items in the trainee’s mind. The ninth experiment on the morning of the third day finally yielded a breakthrough. The machine’s coolant tank was badly contaminated with bacteria of some sort and fouling the concentricity of the solution. This minor issue was enough to cause the majority of the scrap problem on the machine. The question then acquired a new focus: why hadn’t the coolant been checked on a proper interval as specified, and how had this machine been missed? Furthermore, what had contaminated the coolant and how had this occurred?

After resolving the high scrap rate problem in the grinding problem above, the trainee asked his supervisor how quickly he would have isolated the cause of the problem. The supervisor’s reply: about ten minutes. He had solved a similar problem years ago and could tell the contamination by smell. When asked why he did not share this insight up front and saved the trainee several days of work, he remarked, “This way you learned one thing for sure that worked and eight other things that did not work. If I had told you the answer up front you would have learned eight things less.” The trainee’s focus had been in fixing a quality problem. The Toyota manager’s goal was to teach the Toyota way of thinking while solving an actual problem, reflecting one of the deeper, essential frames of TPS, that of developing people as the starting point for making things.



Developing People Before Making Parts

Recalling his days as an Ohno disciple, Teruyuki Minoura muses, “I don’t think he was interested in my answer at all. I think he was just putting me through some kind of training to get me to learn how to think.” Hajime Ohba depicts TPS as fundamentally a system of training where everyone solves problems under the guidance of a mentor. Kenji Miura, head of Toyota’s Operations Management Consulting Division, on recent visit to a European plant chided the plant management, “Don’t have kaizen-men and observers.” This was a strong way of saying that developing a “kaizen consciousness” was the responsibility of the management, not of staff “experts.” In fact, the TPS frames every manager’s job very strongly as:

- Build the performance mindset
- Establish the standard method
- Track actual performance (make problems or abnormalities visible)
- Teach a basic way for analyzing work
- Develop employees through solving problems or improvement tasks

This difference in framing is extremely significant for lean implementation because the goal is not likely to be the same. The endgame of a traditional lean program is a plant that “looks lean,” where the tools in the manual are being used and obvious wastes cannot be seen. In contrast, the goal of the true TPS form is a shop floor where production processes perform at a very high level, but also where every production worker routinely identifies problems in their work routines and actively works on solving them; where supervisors and team leaders coach their direct reports in problem-solving, but are also aware of the most important problems plaguing their work area and are working hard at resolving problems of their own, again under the close guidance of a coach; where line stoppages and gaps between performance and goals are commonplace.

Certainly solving the problem at hand is important. But just as important, perhaps more so, is the learning and skill development that takes place. In this sense, problem resolution is the test or confirmation of the learning. Thus, TPS mentors ask structured questions that force the trainee to stay on track and reinforce the problem solving mindset:

- What is the exact problem in question?
- What is the specific goal of your activity?

- What is the root cause of the problem?
- What action items are necessary to solve the problem?
- How will you check the actual effect of the action items?
- What remains to be addressed to achieve your goal?

In TPS, a problem or any deviation from a standard requires immediate attention. For a supervisor or manager, however, it is not only a matter of solving the problem; it is a matter of training and development as well. A true measure of a manager is said to be when he hands over duties to a subordinate. If performance stays on track after the hand off, the manager has done his job correctly. If performance falls, the manager is viewed by everyone as having done a poor job in terms of employee development.

The Role Of The Tools

All of this talk of frames is not to say that the principles and tools of TPS are unimportant. They have a key role to play in frame-control. Lean principles function to orient the thinker in the right direction, such as the Just-in-time principle to reduce or eliminate the stagnation of material and information, or the Jidoka principle to build quality into the product by “stopping at the first defect.” The lean principles tell us which performance metrics are important (*performance mindset* frame control), help us identify problems (*problem awareness* frame control), provide direction in the appropriate countermeasures to move the operation forward with a learning approach (*problem-solving* frame control), and indicate what concepts must be mastered and internalized as part of one’s skill development (*developing people* frame control). Thus lean principles are important, but do not supplant the primary frame. Rather, they guide organizational behaviors and priorities in ways that deepen the basic frame.

The lean tools take on a whole new dimension from this new perspective. They become much more than just mechanisms to implement the lean ideals, as important as that is. They also become vehicles by which the deep frames are instilled. For instance, from the typical frame, 5S is often seen as a straightforward housekeeping tool or practice (“everything has a place and everything in its place,” etc.). However, with the new frame in mind, what was a tool or practice for cleaner working environments becomes a way to develop an operator’s knowledge and responsibility about their work cell. 5S becomes an ongoing practice to help people think about how their workstation is laid out and arranged, and for them to act on all the small things that can make it better, safer, more ergonomic, and easier to work in. Companies that do not share this frame will hire external consultants or appoint a “5S manager” to make sure that the shop floor is clean all the time, not recognizing that the teams must take ownership for their cells, by applying the tool themselves! Management in these companies understands the part about cleaner environments, but they completely miss the “developing people” frame. Not surprisingly, like a fad diet without change in the fundamental behavior of the person, these “5S” drives fail time and time again. The tool is important, but must be applied with the proper frame in mind.

Value stream mapping is another useful tool for companies on the road to lean. From the typical frame, the VSM helps the plant (or value stream) manager envision what the overall material and information flow in the lean system should look like, identify the true value-adding activities, and determine the potential for production lead-time improvement. However, from the new frame, VSM highlights specific kinds of problems (i.e., those related

to stagnation of material and information flow), and where to focus their people's problem-solving efforts to have the biggest impact on performance measures of significance to overall plant performance. From the traditional frame, VSM is useful; from the TPS frame, it is powerful.

Certainly, workshops (or "kaizen events") such as flow-and-layout manpower, Single Minute Exchange of Die for lowering tool change-over time, or Quick Response Quality Control are invaluable tools to kick-start the thinking process in any plant. But to gain sustained improvement over time, these efforts must be conducted with the right frame – to uncover problems, challenge assumptions, resolve problems, and ultimately help shop floor staff learn how to best use their existing equipment to produce better parts for the customer. The act of improvement however in TPS can not be separated from that of people development. In TPS the Japanese phrase "mono zukuri wa hito zukuri" (making things by making people) is a required way of life.

Management Implications

The framing debate has considerable managerial implications, both at the levels of day-to-day management and for the deployment of "lean" programs. Firstly, frame control becomes essential, that is, the ability to keep the frame of reference focused on the right things: performance improvement, problem awareness, solving problems the right way, and developing people. This, in itself, is a major challenge for any manager, whose days are typically consumed by fighting one fire after another. Making sure that managers and supervisors surface problems rather than go around them, and then treat them as development opportunities for employees requires a deep commitment to continuous improvement, and rigor in day-to-day applications. Truly, many TPS tools properly applied will help, as their main purpose is to make problems appear at the right place, and the right time. Moreover, "frame control" also applies to the way programs for lean transformation are conceived and deployed, on four main points: focusing on performance in terms of customer delivery; using the tools to back track to problem areas and find out what is really limiting performance; identify problems one at a time, and develop the individual by asking them to solve these problems rigorously; and establish a system of training in which every manager has a coach, works on problem solving and coaches his own people in turn¹³; similarly, every front line employee works on problem solving with the guidance of a coach.

The broader managerial challenge is to shift from using TPS principles to produce brilliant products and processes, to applying TPS frames as a means of developing people. In Toyota, implementing TPS is not just a staff issue but a line role, starting with the plant manager. Indeed, within Toyota establishing work standards and fostering kaizen is a key supervisory role; and supervisors, not engineers, are accountable for both work instructions and line performance in terms of productivity and quality. Consequently, deploying TPS through a firm is not about how many areas have been "kaizenized" but how many plant managers, and then supervisors and team leaders, have been trained by a sensei and can start training people on their own.

Consider the case of Isao Kato who is now a retired manager from Toyota's training and development department in Japan. Internally for many years he was famous as Toyota's inter-

The framing debate has considerable managerial implications, both at the levels of day-to-day management and for the deployment of "lean" programs.

Organizational Learning in the Toyota Production System

Manufacturing operations are fundamentally social systems. Even the most automated facilities depend critically upon people for operation. And where the role of the social system is critical, the importance of learning is paramount.

Takahiro Fujimoto, a world-renowned scholar on Toyota and the Japanese automotive industry, has attributed Toyota's phenomenal success to its highly advanced learning capability.¹⁶ Best-selling author Jeffrey Liker similarly cites organizational learning as central to Toyota's management principles.¹⁷ These conclusions are not terribly surprising as the disciplines of organizational learning can be found within the basic tenets of the TPS. For example, that Toyota expects everyone to learn their own job, and then once mastered to learn other jobs on their team as well. This cross training is but one example of a company dedicated to personal mastery. A second example is kaizen (or continuous improvement), the bedrock of TPS. Any improvement requires skill in problem solving; but within TPS, merely fixing a problem is not good enough. You must investigate to find the root cause, and implement countermeasures that prevent the problem from recurring, i.e., double-loop learning.

In Toyota's case problem-solving necessarily involves both individual and team effort with ideas, suggestions, and critique coming from anyone. In other words, team learning is central to kaizen. TPS keeps a constant eye on the same targets (e.g., shorten production lead-time) and instills a common sense of purpose or shared vision. Through continual learning and experimentation, mental models are challenged, refined, and sometimes completely altered. Finally, TPS masters understand that individual actions often have unintended consequences for the rest of the system. For example circumventing standard work processes even though you may think "your way" is better is not an acceptable way to improve the system. Additionally some tactics that may cause elements of the system to "under-perform" at a local level (e.g., frequent product changeovers that reduce uptime and throughput) are employed if it means overall system performance improves. In short, TPS masters are systems thinkers.

We have observed many organizations that view TPS as a collection of tools that remove wasted time, energy, and motion from organizational processes. But we think TPS should be seen equally as a thinking production system. Without this mental model, a learning organization is unlikely to emerge no matter how adeptly the tools are applied. The four frames we propose are often absent in lean transformations we've observed, yet are central for any manufacturing firm whose leadership aspires to become a learning organization.

nal master of standardized work, among other topics. Toyota did not attempt to train every employee in the company in standardized work, as there are over 200,000 employees in the company. Instead, for each plant around the world, Mr. Kato would develop ten or so standardized work trainers who were acknowledged as good supervisors and potential competent instructors. The ten people selected attended a two week special course on how to teach standardized work. Upon successful completion of the course, they would return to their home plant and teach the ten hour (five days by two hours) course under the strict supervision of Mr. Kato. Once certified as competent instructors, they were responsible to teach all their fellow supervisors standardized work as the need arose in the future. Mr. Kato worked with production managers to make sure they followed up on the courses and made sure the lessons were applied. Beyond this level, however, standardized work was now a plant management responsibility – not a staff or training department issue. Virtually all off the job training is handled in this cascaded fashion¹⁴ in Toyota. This is not an easy challenge and Toyota itself is suffering from a dearth of experienced masters like Mr. Kato (and many others on different topics) as it grows faster than its capacity to develop "masters." Still, compared

to traditional companies where management continues to manage by the numbers and fire-fight, and a few staff people are given the impossible mission to “apply lean” in all processes, engaging the creative potential off every organizational asset seems a better recipe for sustained success.

How people frame problems has real consequences. Until this fundamental truth is acknowledged, and lean converts face up to the need of developing frame control in applying the tools and techniques developed by Toyota, lean transformation will continue to be slow, frustrating and ultimately unrewarding. If your frame is “apply lean tools and principles to every process,” you will certainly gather the low hanging fruit, but the potential for your lean transformation will remain limited. On the other hand, if you frame lean transformation as “change the thought processes of every employee to develop kaizen consciousness,” the potential is unbounded. In the present industrial context, the framing issue is not just of academic interest as a manner of explaining why paradigm shifts are so slow and painful. It is of critical importance for firms investing resources, time and efforts in a lean transformation and who need to radically improve their performance if they want to compete with low cost providers, who, incidentally, are also improving their own operations at an incredible pace. The TPS masters, the true lean experts and originators of lean, realize they’re not in the same framework as the people they’re trying to coach, but, conversely, the frame of their audience is so strong, their message is not heard!

In the end TPS is best viewed as a developed practice, not a theoretical philosophy or set of tools. Lean is not and probably never will be a codified body of knowledge. It’s the cumulative behavior and experience of the people who practice the system. And although its practice is demanding and difficult because it does not come naturally to our organizations or our mentalities, TPS, the Thinking Production System is also profoundly empowering. In the words of Michikazu Tanaka, a former managing director of Daihatsu Kogyo who was trained by Taiichi Ohno: “In terms of results, [TPS] involves reducing work-in-process, raising productivity and lowering costs. But the real aim is to bring out the capabilities of each individual. The ultimate aim is to draw out people’s motivation.”¹⁵

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Commentary

By Roger Saillant



Roger Saillant

I became involved with the Society of Organizational Learning for two reasons. The first was that my launch plant manager in Hungary gave me a copy of *The Fifth Discipline* to read and it resonated strongly with my own thinking. The second was that Bob Womac, my then boss and the General Manager of the Electrical and Fuel Handling Division in the Ford Motor Company, had been to a meeting with Peter Senge and upon returning declared that “we would become a learning organization.” Bob had become a huge proponent of the idea because Peter had shown him a graph that illustrated the rate of learning at Toyota was greater than at the Ford Motor Company. In fact, it was clear from the conceptual graph that within less than ten years Toyota would pass Ford in market share and they have.

About ten years previous to the idea of the learning organization, I was a manager in the engine engineering planning department at Ford. We were evaluating how Toyota and Honda manufactured their engines and emissionized (calibrated) their engine systems in a repeatable fashion at such low costs. Ford sent teams of engineers and manufacturing experts to Japan to study their factories.

Toyota has enormous respect for Ford Motor Company and Mr. Ford’s manufacturing strategies and they were open to visits as a form of respect. These teams reported back that the “Toyota Production System” was at the heart of their success. This system allowed them to improve their processes continuously which, in turn, lowered their costs.

When we analyzed the advantage of Toyota, we believed that we could account for about 65% of their cost advantage through “hard practices” like lean, Kanban, and newer equipment under tight statistical process control. The other 35% seemed “soft” – or they were keeping secrets from us. Along the way we learned that they had a suggestion program which was based on the old Ford suggestion program, a formal, structured system for filtering new ideas from employees, using monetary incentives. Toyota had copied the program in the 1950’s and then improved on it. Toyota’s suggestion program had many “soft” elements which emotionally engaged Toyota workers at every level, got everyone “thinking” creatively, and led to the results discussed in “The Thinking Production System.”

I believe that Messrs Balle’ et al have captured the power behind the thinking at Toyota. The Toyota workers approach their work with the idea of making it a practice, a disciplined effort to move attribute (subjective) data to variable (measurable) data in all they see. The ability to practice this approach mirrors our ability to move from novices to masters in our professional lives. The movement through the various stages of development toward mastery is all about learning how to think with better discipline and more skill each day – an ongoing process that is never complete.

I believe that the book *Presence* (Sol, 2004) offers insights that are touched upon in this article. The idea of “frameworks” and “frame control” is consistent with the “U model”

that forms the underlying theory of the book, and explains to me why Toyota is successful and why Ford struggles. The U process lays out a developmental path for learning which can change “frameworks” or mental models, thus achieving lean transformation by, as Balle et al point out, changing thought processes.

The description of the “Master” supervisor and the “novice” trainee illustrates several deep ideas that are generalizable beyond Toyota and beyond the manufacturing floor. As noted, the trainee was focused on the problem while

the supervisor was focused on the practice of becoming a thinker. The Toyota managers know how to recognize the status of people’s thinking, where they are in the “U,” and move them toward letting go, then to letting come, and ultimately to institutionalizing. The Ford folks (representing a majority of American management today) are still not “seeing their seeing” and therefore are hung up before they start the process. The old adage that the “hard stuff” is really the “soft stuff” remains true for us all.

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Distributing Leadership Practices for Lean Transformation¹

George Roth



Many organizations have achieved impressive results in various aspects of their business through lean transformation. Few firms, however, sustain those initial results, and many struggle to bring the results down to a bottom-line impact. This article links research literature on change management with lean case studies and presents a form of distributed leadership that facilitates lean transformation. Distributing leadership practices is one of five capabilities identified for successful lean enterprise change (see Table 1). A working paper that discusses all five capabilities in depth can be obtained by request from reflections@solonline.org.

Understanding what leaders do in successful enterprise change requires a consideration of the scope of that change. Daniel Jones, coauthor of numerous books on lean production and chair of the Lean Enterprise Academy, observes an important relationship between leaders and change. The transition to lean enterprise requires *kaikaku* – a shift in the fundamental logic and layout of organizations – along with *kaizen* – activities aimed at continually improving operations and eliminating waste. Although companies make *kaikaku* changes and promote *kaizen*, “if the logic in the heads of management has not changed along with the physical operations then things will easily slide backwards” (Jones, 2005). The *kaikaku* redesign of the core value-creating processes, Jones notes, is too important for leaders to delegate. Leaders cannot delegate their lean involvement because their engagement is what enables them to examine and change the logic in their heads. That change or transformation in the leaders’ logic is essential to the transformation of the enterprise.

The history of the term *lean* helps clear up the confusion that often surrounds what it means to *be lean*. *Lean* was coined as a term to describe what was best represented by the Toyota Production System –

factories producing a vast variety of automobiles with half the human effort, half the manufacturing space, half the investment in tooling, half the engineering hours, and half the new product development time of mass production factories (Womack, Jones, and Roos, 1990). The term *lean* is based on the view of a whole system; it is much more than the set of practices broadly implemented by many managers who then identify their company as lean.

Lean is not a program or an outcome, nor does it reside at an executive level or within the workforce. Lean is a way of operating that spans from executive strategy setting for developing people and managing business growth to the commitment of the workforce to continuous improvement. Although lean has come to be defined primarily by the use of highly visible tools, they are only the surface artifacts of a deeper culture. Many companies today make use of lean tools; however, leaders should not mistake those artifacts with the deeper changes that lean implies. Spear and Bowen (1999) have noted that despite extensive study, companies are unable to replicate the success of Toyota because they confuse the tools and practices with the system itself.

The management challenge for successfully becom-

ing lean goes beyond the extensive use of lean methods to the transformation of a business system. It is much easier to add on to existing ways of working and thinking than it is to make fundamental changes. Top leaders, excited by the lean results that they have seen, often add a layer of lean tools to their organization's existing practices. These efforts become, at best, a partial implementation that produces only limited improvements. Successful lean transformation always involves changes in organizational structure and in an organization's culture, which relies on changing people's assumptions. Schein's (1992) definition of organizational culture links people's underlying assumptions with their expressed values and beliefs, and with the visible artifacts of an organization. The culture of an organization emanates from beliefs that its leaders promote and the historical challenges that they have faced.

Differences in enterprise design are a function of managers' fundamental assumptions about their environment and their organization's people. To lean practitioners, the word *enterprise* has a specific meaning: It is the collection of organizations that make up a product or service value stream. Leaders in lean enterprises seek cooperative relationships between their organization and its environment, looking for opportunities to communicate and develop relationships. Managers in mass production organizations, in contrast, see environmental factors and stakeholders as largely external and immutable, and therefore tend to hold them at arm's length. It is the differing assumptions of leaders and their design choices that create these contrasting forms.

The challenge for leaders in lean transformation involves the *magnitude*, *wholeness*, and *depth* of changes needed. The magnitude of change encompasses the many differences in the characteristics of mass production organizations and lean enterprises. The wholeness of the change has to do with switching between configurations, in moving from one organizational logic, archetype, or gestalt to another (MacDuffie, 1995). The depth of the change deals with the basic assumptions that are the root of organizational culture. Each dimension of change on its

Table 1: Five Capabilities for Lean Enterprise Change

1. Rethinking organizational boundaries

- View own organization as a part of a contiguous value stream

extend the domain to environmental relationships

2. Installing innovation sets

- Build upon complementarities of practices

extend the scope to include sets of changes as coherent programs

3. Pushing and pulling change

- Set in place structures and processes that enable virtuous learning

extend the methods to integrate the two change approaches

4. Seeking growth opportunities

- Project a positive vision for continual renewal

extend the strategy to growth and development

5. Distributing leadership practices

- Recognize interdependent roles in a system of leadership

extend leadership to all levels of the enterprise

own implies a significant shift. Taken together, the set of changes points to an enormous abyss over which leaders must guide their organizations. Successful leaders realize the expanse of this gulf and know that small steps will not allow the organization to cross that chasm. Doing so requires a great leap.

Organizational Effectiveness and Occupational Communities

As leaders guide their organizations through changes in structure and culture, they also need to support the many small steps of continuous improvement efforts. The ways in which firms improve their operations are embedded in their organizational structure. Managers within different functions have developed improvement methods that are largely unique to their areas.

There are three broad courses of action for

improving organizational effectiveness – accessing external resources, bettering internal systems, and adopting efficient technologies (see Table 2). External resource improvement approaches include strategic planning, financial engineering, marketing, lobbying, and developing partnerships or strategic relationships with other firms or external stakeholders. Technical approaches seek to improve service and quality or reduce defects and costs through the use of analytic methods or information technologies. Reengineering, Six Sigma quality, and industrial engineering are examples of technical approaches. Internal systems improvement approaches include team building, high-performance work systems, conflict management, and other organizational development initiatives. Internal systems efforts aim to improve the motivation and well-being of people to advance the overall organizational performance (Jones, 1997).

Each of these organizational effectiveness approaches is associated with specific positions, job functions, roles, and ultimately professions. Given that specialization, people in different areas and functions base their improvement efforts on what

are largely their own, independently developed and uniquely practiced principles, tools, and methods. Executive leadership, which includes the organization’s top managers and their staff, works strategically to improve access to resources and markets. Line leadership, which includes senior and middle managers responsible for divisions, plants, offices and programs, has operational responsibility for the creation and delivery of products and services. Line leadership’s improvement methods include efforts that result in greater coordination and collaboration at their level. Finally, technical approaches, which are carried out by people with specific expertise, include the use of technologies and analytic methods to improve operational functioning and efficiencies.

The generic names of improvement tools and methods associated with organizational effectiveness approaches are listed in Table 3. Many of these tools are developed and used just within the set of people in the roles listed in the table. Strategic marketing is largely an approach that executives use, for example, whereas team-building efforts involve customer service groups, and Six Sigma quality efforts are carried

Table 2: Approaches to Improving Organizational Effectiveness (adapted from Jones, 1997, p.28)

Approach	Description	Goals to Set to Measure Effectiveness
External Resource	Evaluates the organization’s ability to secure, manage, and control scarce and valued skills and resources	<ul style="list-style-type: none"> • Lower costs of inputs • Obtain high-quality inputs of raw materials and employees • Increase market share • Increase stock price • Gain support of stakeholders such as government or environmentalists
Internal Systems	Evaluates the organization’s ability to be innovative and function quickly and responsively	<ul style="list-style-type: none"> • Cut decision-making time • Increase rate of product innovation • Increase coordination and motivation of employees • Reduce conflict • Reduce time to market
Technical	Evaluates the organization’s ability to convert skills and good resources into goods and services efficiently	<ul style="list-style-type: none"> • Increase product quality • Reduce number of defects • Reduce production costs • Improve customer service • Reduce delivery time to customer



out by industrial engineers. Each occupation has its preferred tools – engineering students learn operations research and design experiments, while management students learn strength-weakness-opportunity-threat (SWOT) analysis and leadership skills. What people learn in universities extends to professional associations and on-the-job experiences – people in different positions practice approaches specific to their function. That organizational focus on using specialized methods helps to build deep knowledge in functional areas.

But whereas managers may organize their firms into units around tasks for rational or administrative reasons, the people in these units conceive of their work more collegially in “occupational communities.” These communities are made up of “a group of people who consider themselves to be engaged in the same sort of work; whose identity is drawn from the work; who share with one another a set of values, norms and perspectives that apply to but extend

beyond work-related matters; and whose social relationships meld work and leisure” (Van Maanen and Barley, 1984, p. 287).

Occupational communities provide a frame of reference for why people behave as they do in organizations. Because an organization’s formal conceptions of work can overlook what it really takes to get a job done, managers’ efforts to have people adhere to espoused practices can undermine the actual practices that organizational members develop. The actual practices are what enable improvement and determine the success or failure of an organization. Using Lave and Wenger’s (1991) practice-based theory of learning, Brown and Duguid propose “communities of practice” as important structures for learning. To understand performance and learning in organizations, “it is necessary to focus on the formation and change of the communities in which work takes place” (Brown and Duguid, 1991, p. 41).

Barriers to Learning in Organizations

Participation in occupational communities or communities of practice creates social structures that facilitate interaction and learning and help members to develop practical skills. But, because organizations are usually structured by function or department, it can be difficult for them to develop knowledge across units. For example, organizations may utilize very good engineering tools for designing products, or very good accounting tools for capturing costs and allocating expenses. Departments within organizations are often skilled at applying tools, but they frequently do so only within the boundaries of their responsibilities. The shared experience of a functional group or occupational community that cuts across artificial structures can facilitate an organization’s internal learning processes.

Schein (1996) found that organizations had trouble learning and improving because of consistent

failures to communicate across the subcultures of their occupational communities. Organizations as a whole develop unique cultures that arise from their members’ shared experiences; however, the same process operates within different units of large organization, creating variations in the overall culture, or subcultures. Several particular subcultures were so consistent across large organizations that Schein described them as three distinct “cultures of management” (see Table 4). The three subcultures – the culture of engineers, the culture of CEOs, and the culture of operators – exist in all large organizations. They do not understand each other very well, and they often work at cross-purposes. Many organizations fail, or remain only marginally competitive, not because of resistance to change, but because of a fundamental inability to reconcile the differences in subculture assumptions. “Until executives, engineers and operators discover that they use different languages and make different assumptions about what is im-

Table 3: Linkage of Organizational Effectiveness Approaches to Leadership Roles, Occupational Community and Improvement Methods

Approach	Leadership Role & Occupational Community	Improvement Tools & Methods
Accessing External Resources	Executive leadership and staff functions to leadership, chief financial officer, chief operating officer, strategic human resources, legal counsel	<ul style="list-style-type: none"> • Planning (SWOT) • Financial engineering • Legal restructuring • Leadership • Managerial accounting • Strategic marketing • Mergers and alliances
Bettering Internal Systems	Line leadership; geographic, division, and plant management; responsibility for plants and factories	<ul style="list-style-type: none"> • Team building • Cross-training/ multi-skilling • High-performance work systems • Employee involvement • Conflict management, negotiations • Gain sharing • Open book management • Budgeting and control • Supplier management • Kaizen improvement
Adopting Efficient Technologies	Technical leadership, engineering management, internal consultants and experts, black belts	<ul style="list-style-type: none"> • IT systems – MRP, EDI, CRM, etc. • Reengineering • TQM, TPM • Value engineering • Operations research • Activity-based costing • Theory of constraints • Lean producton • Six Sigma Quality • Cellular manufacturing • Design of experiments

portant, and until they learn to treat the other cultures as valid and normal, organizational learning efforts will fail,” according to Schein (1996, p. 18).

Leadership for Learning Across Organizations

Studies of change-associated organizational learning initiatives found that deep cultural changes required an alignment of “leadership roles.” Leadership in

this sense is not confined to a position in the hierarchy, but is seen as a capacity to engage “a human community to shape its future and specifically to sustain the significant process of change required to do so” (Senge et al., 1999, p. 16). By this definition, organizations have many leaders at various organizational levels who play critical roles in initiating and sustaining learning and change. When the three leadership roles important to learning – the executive, local line, and network leaders – are operating

Table 4: The Three Cultures of Management (developed from Schein, 1996)

The Cultures of Management	Operator Subculture	Engineering Subculture	CEO Subculture
Colloquialisms	The line, middle managers, management, or the boss	Experts, geeks, technocrats, or analysts	Executives, top leaders, Mahogany Row, or the big boss
Scope	Local	Global	Global
Orientation	Making the system work, people, local community, based on core technology	Technological elegance of design, abstract and efficient solutions, people are a source of noise	Financial growth and viability, people are a cost to be managed, manage through impersonal systems and routines
Examples of Basic Assumptions	<ul style="list-style-type: none"> • Success of enterprise depends upon people’s knowledge, skills, learning abilities, and commitment • Required knowledge and skills are “local” and based on the organization’s core technology • Operators need to learn and deal with surprises in the production process • Operators must be part of a collaborative team in which communication, openness, mutual trust, and commitment are valued 	<ul style="list-style-type: none"> • We are proactive and optimistic; our ideal is mastering nature • We are stimulated by puzzles and problems • We are pragmatic perfectionists who prefer solutions independent of fickle people • An ideal world is made up of elegant machines and processes that work with precision and do not need human intervention • We are oriented toward safety over design • We prefer linear, simple cause-and-effect, quantitative thinking 	<ul style="list-style-type: none"> • Financial survival and growth must be our focus • We are in a perpetually competitive and hostile environment • We need to appear in control and be indispensable • We must rely on our own judgment because subordinates do not give reliable data • Hierarchy helps to maintain control • We take risks only in ways that maintain control • Large organizations require rules, routines, and rituals • Challenge and achievement, not relationships, define success

together, organizations create a distributed leadership system that enables them to transform themselves.

Perceptive executives do not rely on the power of their position to enforce change because that subtly reinforces the view that management is the source of problems – and solutions. When people in the organization hold the assumption that only executives can cause significant change, they have disempowered themselves. Executives need to hold realistic views of the limits of their powers, realizing that people in large organizations have become cynical about “flavor of the month” management fads (Senge et al., 1999, p. 13). Executives are removed from the organization’s direct value-producing process, and, although accountable for overall corporate performance, they have little ability to directly influence actual work processes. They are, however, vital in setting a vision and creating the environment, support, and resources for learning, improvement, and change. What executives can do is walk their talk, and influence others by their involvement, commitment, credibility, and sincerity.

All corporate change must eventually become local. The programs, resources, encouragement, or orders coming through an organization affect the thinking and behavior of people doing work. Local line leaders, the managers accountable for results with authority to undertake changes, need to be involved in any change that is to be meaningful and sustained. These local line leaders may have responsibility spanning from a department to a large facility or factory. Given their accountability for results, and the history of corporate initiatives, these managers often become skeptical of executive-driven programs. Too often, they have had to take on activities from these programs and still deliver bottom-line results. Local line leaders are knowledgeable on entrenched and vexing problems, and they are vital to transformation because only they can undertake organizational experiments and test the practical impact of new approaches. Without local line leaders’ involvement and commitment, organizations struggle to initiate, and are unable to sustain, change programs.

In these studies, which examined the broad diffu-

sion of learning and change in organizations, there were no examples of success “without the enthusiastic participation of effective internal networkers” (Senge et al., 1999, p. 17). People in the role of “network leader” help to close the gap between vision and implementation. Network leaders pull together the vision, support, and resources of executives to address the needs of local line leaders. Their limitation – a lack of positional or formal authority – is their strength. It is possible for network leadership roles to be played by people with formal authority, but they would not be invoking their authority in that role. Instead, network leaders, who are often from executive staff, business improvement personnel, or corporate training groups, move around the organizational freely and largely unnoticed. They enroll people in improvement efforts because of the strength of their conviction and clarity of their ideas.

American companies often do not value network leadership because it is informal and exists outside official corporate influence mechanisms. In contrast, studies of Japanese management methods show how highly the Japanese depend on informal authority. One of the essential characteristics of lean enterprise is the role of managers as leaders and mentors, using direct but casual methods for diffusing improvements. In Spear’s (2004) account of training at Toyota, he describes a new leader’s process of helping his subordinates achieve their improvement goals, and learning that he should not make the changes that achieve these goals for them. This knowledge can not be simply gained in a classroom; it must be experienced in the workplace.

A System of Distributed Leadership

Organizational transformation offers a paradox: No significant change occurs unless the top drives it, and no significant change occurs if the top drives it. Without top management buy-in, organizations cannot sustain change efforts. Conversely, top management buy-in is a poor substitute for genuine commitment spread throughout the organization.

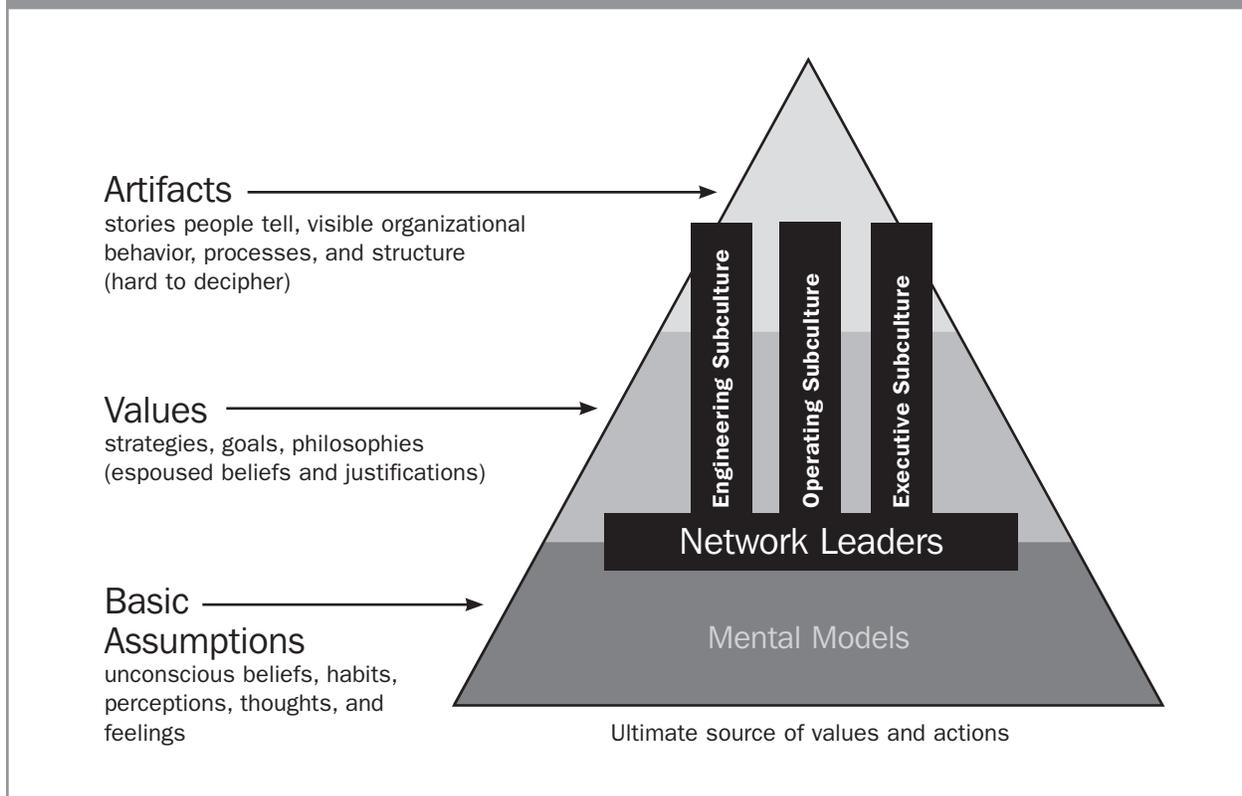
The solution to this paradox of transformation lies in the distinction between commitment and compliance. The hierarchical authority needed to “drive change from the top” favors compliant behaviors, which undermines the commitment and local leadership needed at multiple organizational levels to sustain change. Organizational transformation requires that a variety of roles work together to enable changes: a three-part system of distributed leadership.

The three leadership roles for learning (Senge, 1995; Senge et al., 1999) overlap with the three cultures of management (Schein, 1996). There is a direct link between CEO culture and executive leadership roles and between operator culture and line leadership roles. This overlap is created because the CEO culture, by virtue of position and responsibilities, naturally exhibits the characteristics of executive leadership roles.

The third pairing is not quite so direct. However,

there may be a link between an engineering culture and network leadership roles. Although network leaders might come from engineering cultures, they are effective in their network leadership roles precisely because they function outside other occupational communities and without formal influence. Network leaders bridge occupational communities, and firms cannot effectively sustain organization-wide changes without learning across these communities. Senge (1995) calls network leaders “internal community builders” because of their important role in working outside the organization’s system of formal authority. Network leaders bring together people who are predisposed to experimentation and change, and hold them together through a shared vision for improvement. Studies of learning efforts within organizations found that common values were the glue that binds such groups, noting that they were really “communities of commitment” (Senge and

Figure 1: System of Distributed Leadership



Kofman, 1999). Without the commitment that these groups develop from working together, organizations would be unable to sustain their learning efforts.

The organizational learning and culture research findings provide insights into the leadership needed to sustain lean changes. Learning and change are sustained through a system of distributed leaders in which network leaders bring executive, line, and engineering occupational communities together. The collective efforts of multiple leaders enable learning and improve performance across organizations. One depiction of distributed leadership is the system that is formed by overlaying the three cultures of management, connected by network leadership, on the three levels at which organizational culture is manifested (see Figure 1). In the background are features of the cultures, including artifacts, and values, and underlying basic assumptions. The three cultures of management together make up the organizational culture. The operator subculture, which is locally based, most strongly identifies with and is central to the organization's culture. The executive and engineering subcultures are more global, and are linked to external communities as part of their professional identities.

Organizations will not learn effectively until they recognize and confront the implications of different organizational cultures. "To create alignment among the three cultures, then, is not a case of deciding which one has the right viewpoint, but of creating enough mutual understanding among them to evolve solutions that will be understood and implemented," according to Schein (1996, p. 17). In a system of distributed leadership, leaders in all these roles are aware of each other and their strengths and differences, and they align so that efforts provide cumulative results. When this system of leadership is working, what seems like an incremental change process (often part of a lean, Six Sigma, or continuous improvement program) can become more dramatic as time goes by. Judged over time – one year, two years, five years – the accumulation of many little changes results in a radical transformation.

Distributed Leadership to Bridge Organizational Boundaries

Network leaders draw people together to initiate and maintain continuous improvement efforts, connecting needs and opportunities with available resources. They create bridges across the three cultures of management (see Figure 1) and do so informally, using their passion, power of persuasion, and influence skills. They do not rely on formal power, but work with managers who are predisposed to leading improvement efforts. If network leaders fail to gain the support of, influence, or inspire line managers in their improvement experiments, the use of authority to make local managers do something they do not want to do would sow the seeds of discontent and failure. When local leaders are not themselves motivated and personally committed to changes, the result is unintended consequences, inauthentic behaviors, backsliding, and unrelenting resistance. The foundation for continuous improvement is the motivation and engagement of line leaders – something for which there are no substitutes. If network leaders gain too much power, they will be tempted to use that power at times to coerce or manipulate leaders into efforts whose outcome they are not committed to achieving. Network leaders support other leaders' formal performance responsibilities while appealing to their innate desires to learn and improve.

Cultural boundaries between occupational communities can inhibit the success of improvement activities within organizations. Engaging people by using the relationships within occupational communities can help to overcome organizational boundaries. The linkage between occupational communities can be highly effective in supporting new learning, facilitating the diffusion of new practices, and accelerating changes. For instance, CEOs and other members of the executive culture envision themselves as part of a larger financial community, responsible for the organization's fiscal health and preoccupied with boards, investors, and the stock market. Only people within that occupational community of their organization share their concerns and world views, but

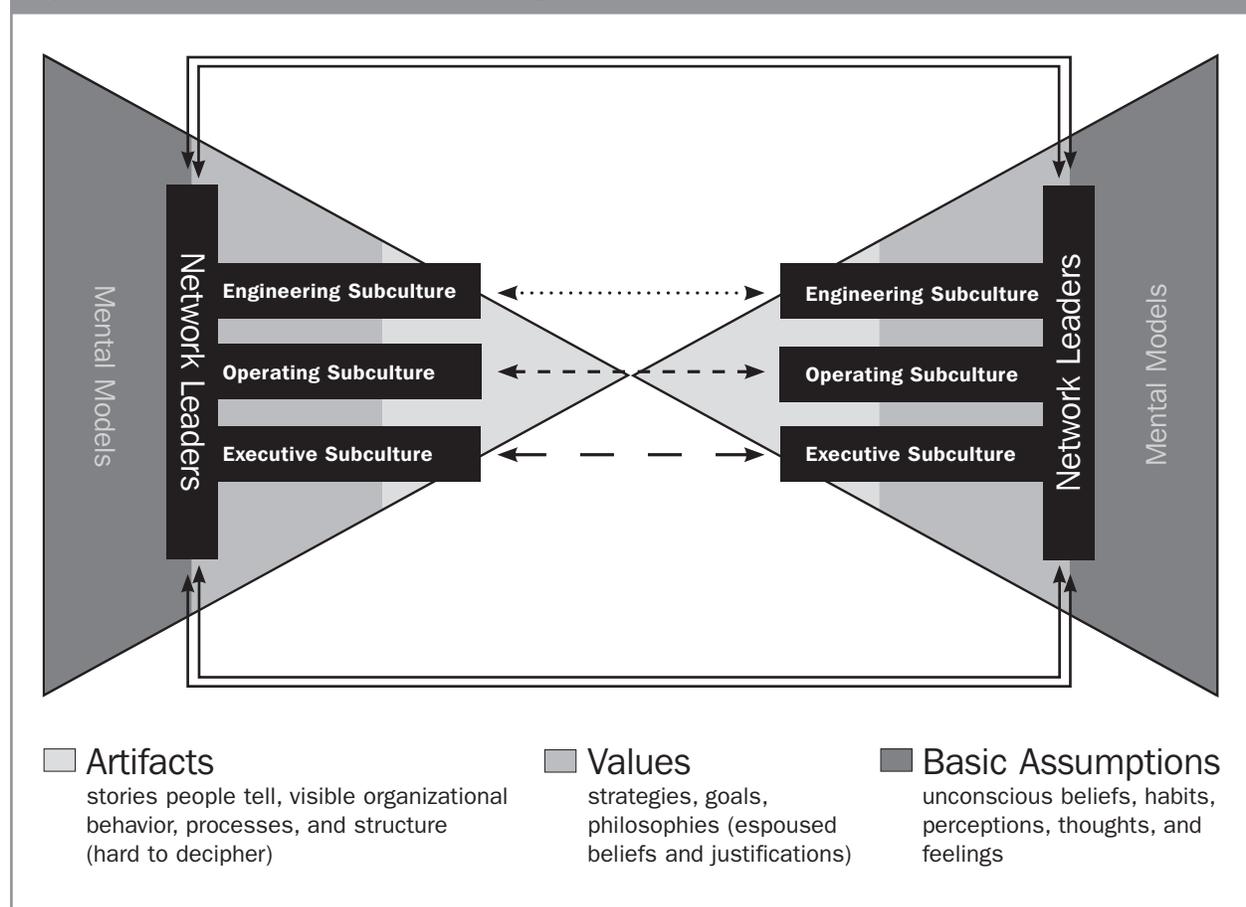
they are similar to the concerns and world views of CEOs in other organizations. Therefore, CEOs from different firms will find that they have much in common, and those commonalities will help them to understand each other. That common world view facilitates their collective learning and change.

Several examples illustrate the power of connections across organizations through the CEO subcultures. Tower Automotive, a fabricator of metal parts, supplied domestic automobile companies. Executives were “accustomed to seeing a Big Three buyer only once every five years” (MacDuffie and Helper, 1999, p. 166). When Honda was interested in working with Tower, the president and members of the board of Honda of America visited the company, making a strong impression. This and subsequent visits led to

new business, supply of tooling, and Honda’s BP team coming to work with and make process improvements at Tower. The business with Honda increased greatly, as did the learning for process improvements that Honda discussed with Tower.

When Boeing realized that it needed to make dramatic and continuing cost cuts, which its suppliers needed to match, Boeing executives held sessions to meet with the executives from its suppliers. Clay Jones, then a vice president and now the CEO of Rockwell Collins, clearly remembers attending one of those sessions. The Boeing executives showed him why Boeing’s survival depended upon immediate cost reductions and the ability to cut its costs 5 percent annually thereafter. Boeing needed its suppliers, including Rockwell Collins, to make similar cuts if

Figure 2: System of Distributed Leadership Linking Two Firms



they wanted to keep Boeing's business. Boeing was using lean production methods to make these improvements, and it was ready to share what it had learned to help Rockwell Collins. This executive-to-executive exchange impressed Clay Jones, and helped him to embrace, conceptualize, and lead Rockwell Collins's lean initiative.

Engineers' subculture also extends beyond their workplace. Having received their education outside the organization, engineers tend to identify themselves on a global basis with others in their discipline. Their outside professional ties are often stronger than their affiliation with the people in their organization. In working across organizations, the connection between engineering cultures, where people are like-minded, facilitates learning and change. When Honda worked with Tower Automotive, its engineers visited multiple times per week, and immersed themselves in Tower's technical problems. For example, they provided steel from Honda's Japanese supplier, proved that it was easy to work with, and worked with Tower's US steel supplier on steel and process improvements (MacDuffie and Helper, 1999).

To function more effectively as enterprises, firms use occupational community linkages to bridge organizational boundaries. Rather than have the lean experts from an industrial engineering subculture in the large company work with executives in supplier organizations, the executives in the large company are more effective in their communication with executives from supplier firms. Executives across firms have similar training and experiences, can better understand one another, and can speak directly to the implications of proposed changes. The nature and substance of communication across subcultures is unique to those communities.

The insight from occupational communities explains the value that firms gain when they bring not just executives and experts, but also middle managers and workers, on benchmarking trips. The middle managers and workers can learn from their counterparts in other organizations, and bring back not only knowledge, but also enthusiasm, for changes that they have seen. People can learn and make

changes more easily across organizations when they link with peers from their occupational community (see Figure 2). The shared experience, common perspective, and similar world views within an occupational community enables a faster exchange of knowledge across organizations.

Network leadership plays an important role in orchestrating connections within occupational communities across organizations. Not only do they work "top down" by working with executives to set context, they also work "bottom up" to share and develop practices and lessons learned. Managers in network leadership roles not only benefit from connecting with peers, but also can work with other network leaders to facilitate the many connections that help to make broad, sweeping changes across the organizations working together in a value stream. At MIT's Lean Aerospace Initiative (LAI) laboratory, managers can readily meet their occupational community peers from other organizations. In these meetings, people do not just learn from their peers and MIT researchers, but also make connections and develop relationships with people in other government and industry organizations. Network leaders use these relationships to help make other connections and facilitate improvement efforts across their enterprises. For instance, the "Lean Now" projects initiated through LAI brought together continuous improvement experts from these programs: Raytheon's R6S, United Technology Corporation's ACE, Lockheed Martin's LM21, Boeing's Lean Offices, Northrop Grumman's Lean, and Rockwell Collins's Lean Electronics. Together, these experts developed a common training curriculum and common lean improvement project methodology. Peers from the various companies worked together to deliver the Lean Now training and project methodology in making process improvements in the Air Force and other government enterprises. The first three projects – improving the F/A-22 test process, the F-16 contract closeout process, and the Global Hawk evolutionary acquisition process – benefited both the government site and the industry peers who worked together. The government sites reported improvements; individual

experts learned methodologies from other organizations and improved their skills (Rebentisch and Jobo, 2004).

Successful Lean Enterprise Change

When performance gets significantly out of step with expectations, leaders shift from ongoing improvement efforts to turnaround or transformation initiatives – the difference between many small steps and one great leap. They identify and resolve problems by mobilizing activities for diagnosis and inquiry, identifying thorny issues, and setting in place new structures and behaviors. They all build upon a sequence of identifying a path to improvement before planning changes. Womack and Jones (1996) propose a specific “roadmap” (see Table 5) for transforming lean enterprises. This framework consists of 24 steps taken over five years to make the “lean

leap.” The framework is consistent with general change approaches, providing detail relative to lean concepts and their deployment.

The challenge for enterprise leaders is to help people see the alignment of their interests with those of their enterprise, which often involves a shift in basic assumptions, and hence perspective. When leaders can establish a system that operates this way, they have achieved a “system [that] actually stimulates workers and managers to engage in the kind of experimentation widely recognized as the cornerstone of a learning organization. That is what distinguishes Toyota from all the other companies” (Bowen and Spear, 1999, p. 99).

Closing the “Knowing-Doing” Gap

Research by Pfeffer and Sutton on why some companies perform much better than others identified a “knowing-doing” gap, or the gap between what an

Table 5: Time Frame for Lean Leap (from Womack and Jones, 1996, p.270)

Phase	Specific Steps	Time Frame
Get started	<ul style="list-style-type: none"> • Find a change agent • Get lean knowledge • Find a lever • Map value streams • Begin kaikaku • Expand your scope 	First six months
Create a new organization	<ul style="list-style-type: none"> • Reorganize by product family • Create a lean function • Devise a policy for excess people • Remove anchor-draggers • Instill a “perfection” mind-set 	Six months through year two
Install business systems	<ul style="list-style-type: none"> • Introduce lean accounting • Relate pay to firm performance • Implement transparency • Initiate policy deployment • Introduce lean learning • Find right-sized tools 	Years three and four
Complete the transformation	<ul style="list-style-type: none"> • Apply these steps to your suppliers/customers • Develop global strategy • Transition from top-down to bottom-up improvement 	By end of year five

organization “knows” and how it acts or behaves. The differences between businesses do not derive from one company having smarter and more capable people, but from the management practices of the firms and their abilities to either “create or reduce the knowing-doing gap” (Pfeffer and Sutton, 2000, p. 6). Other firms may come to study the successful companies’ approach, but fail to be as successful. The authors’ examples – Southwest Airlines, Toyota, and Honda – turn out to be companies that exhibit enterprise structure and behavior. They note that “there are a number of studies within single industries demonstrating superior ways of managing people and organizing work. Yet although these superior management practices are reasonably well known, diffusion proceeds slowly and fitfully, and backsliding is common” (p. 7). Industry examples in apparel manufacturing, automobile assembly, food plants, restaurant chains, and computer and semiconductor manufacturing all illustrate the frustration of successful people, work, and organizational practices not diffusing. Pfeffer and Sutton found ready agreement on these challenges, and the concept of the knowing-doing gap made sense to American managers. When the researchers discussed it with Asian managers, however (both authors teach at Stanford Business School), the concept perplexed them. Asian managers found it “hard to understand how someone could ‘know’ and not ‘do’” (2000, p. 26). The Asian managers operate in systems where they develop knowledge by doing, embedded in their work practices. The authors again used examples from Toyota and Honda, illustrating the importance in those cultures of:

having people actually see quality defects directly . . . and go to another part of the plant . . . [having a] philosophy that when a person sees a quality problem, s/he is more likely to analyze it systemically, to communicate the problem more accurately to others, and to be more motivated to find a preventative remedy (quoted from MacDuffie, 1997, p. 42).

This approach is about more than techniques and practices; it is a philosophy and perspective about people, process, quality, and continuous improvement, as illustrated by another Toyota example:

On the surface, TPS appears simple . . . many plants have put in an andon cord that you can pull to stop the assembly line if there is problem. A 5-year-old can pull the cord. But it takes a lot of effort to drive the right philosophies down to the plant floor. A lot of people don’t want to give the needed authority to the people on the line who deserve it (quoted from Taylor, 1997, p. 102).

Not only are the successful companies the leaders in their industries and good at doing what they know, but they are also capable in helping their partners – from suppliers through customers in their value stream – do what they know too. In working with suppliers,

“some manufacturers ask, ‘How can I club you into submission?’” says Byron Pond, CEO of Arvin Industries . . . “Toyota asks, ‘How can I help you be better?’” To prepare Arvin to be a supplier, two Toyota engineers spent seven months in Arvin’s Indiana plant, improving processes, materials management, and quality in preparation for a Toyota contract – even though the plant was then making parts for a competitor. “Toyota is an amazing company,” says Pond (quoted from Taylor, 1997, p. 102).

Honda’s BP program has resulted in productivity increases that averaged 50 percent at 53 suppliers (MacDuffie and Helper, 1997). To achieve these gains, a team from Honda worked with these suppliers on largely small, simple, commonsensical improvements. “The genius of the Honda system was in its implementation, not in particularly novel or complicated technical ideas,” conclude Pfeffer and Sutton (2000, p. 15).

Conclusion

The gains associated with lean enterprises, such as Honda, have been achieved by practices that are not emphasized in current change management frameworks. These enterprises manage change through the integration of five capabilities – rethinking organizational boundaries, installing innovation sets, pushing and pulling change, seeking growth opportunities, and distributing leadership practices. As a set, these capabilities create a virtuous and self-sustaining improvement system within and across organizations. These five capabilities extend the domain, scope, methods, strategy, and leadership of change efforts from single organizations to multi-organization enterprises. Top leaders' involvement in these changes is particularly important. These leaders are active in the development and distribution of leadership practices within and across organizations, which helps develop the other four enterprise change capabilities.

Successful leaders of lean enterprises are those who recognize their interdependent roles in a system of leadership, and extend leadership to all levels of the enterprise. Change begins by recognizing the different subcultures and occupational communities within the organization and linking together organizational effectiveness approaches and improvement methodologies through leadership roles and occupational communities. In addition to promoting improvement and change in their own organizations, leaders draw upon occupational community affiliations to bridge boundaries across organizations and diffuse improvement and change. Linking leadership roles and occupational communities creates mechanisms to align people's interests throughout affiliated organizations. These links further distribute leadership and facilitate "learning by doing" across the entire enterprise in creating a system of continuous improvement.

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Endnote

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Commentary

By Bill Bellows



Bill Bellows

The novel concept of distributed leadership, as described by George Roth, offers a badly needed open pathway for progress within the many organizations in pursuit of “lean” practices. For those like me, who have been engaged in similar efforts to improve organizational performance (from TQM to Learning Organizations to Six Sigma Quality), the results are of little surprise – organizations which (to quote the author) “often add a layer of lean tools on top of their organization’s existing practices,” leading to “a partial implementation that produces only limited improvements.”

To paraphrase Dr. Russell Ackoff, what the author finds missing is an awareness of the vital role of a transformation in thinking within these otherwise self-limiting organizations. Lacking such a transformation in the “logic in their heads,” organizations are most certain to miss out on the widespread benefits of lean, as first documented by Womack, Jones, and Roos in their 1990 bestseller, *The Machine that Changed the World*. To follow the herd of lean-seeking organizations and rely on tools alone is to achieve a *reformation* in how work is done, without rethinking it first, also to borrow a concept from Dr. Ackoff.

The insights provided in this article are an invaluable reminder to “change agents” that new tools alone will not propel an organization to achieve the advantages of the few exemplar models of lean. They also serve as a reminder, if not an eye-opening introduction, that transformation leadership can be distributed across the organization. Surely, such a model of team

work will be essential to unlocking the potential of lean.

Moving past the opening paragraphs of this article, the author’s explanations of “barriers to learning in organizations” and “cultures of management” are extremely consistent with what I have witnessed, from first-hand accounts and a seemingly endless stream of anecdotes from “change agent” colleagues around the world over the past 20 years. While our starting points are different, we have arrived at a similar conclusion as the author regarding the dire need for a transformation in thinking, starting with individuals and extended to organizations.

My personal path leading to the obstacles to organizational development followed my introduction to the management theory of Dr. W. Edwards Deming and his frequent castigation of the “prevailing system of management,” which he credited with managing the parts of an organization as if they were both interchangeable and independent. To do so in a school system would be to foster individual and collecting thinking that would attribute the grade on an exam to the student, not to the entire education system, which includes not just the student, but also the teacher, fellow students, and parents, to keep the list brief. To do so within an industrial setting would be to seek out the sole cause of a defect or a cost overrun. In linking back to the need for a transformation in thinking, I have found that organizations which maintain the belief that measurements, such as grades, defects, or cost

overruns, are caused locally by “root causes,” will be the same organizations which follow an implementation plan for lean which is characterized by an emphasis on “tool implementation,” absent the need for seeing the system of causes which result in the measures we collect to manage organizations.

In my efforts to foster a thinking transformation within Pratt & Whitney Rocketdyne, I see a number of striking parallels to the practice

of distributed leadership. Yes, transformation takes longer, but what is the long-term value of investing in the tools of lean without engaging the entire enterprise in the thinking of lean? In the words of Dr. Ackoff, let’s not confuse a *reformation* with a *transformation*.

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The Ulker Star Team: From Human Resources to Human Relations

Bahattin Aydin

with Ulker Star Team members Dogan Demircan, Ahmet Ince,
Aysegul Takimoglu, Muge Aka, Can Demir, Alper Kantar, and Rafet Cirakoglu



Bahattin Aydin

Ulker began in 1944 as a small cookie-making company in the heart of Istanbul. Today, Ulker is one of the largest Turkish holding companies, with US\$6.6 billion in sales and more than 21,000 employees. The core business remains cookies and chocolates, and the company has diversified to offer more than 1,800 products. It has also become vertically integrated, producing its own manufacturing machinery, packaging, and raw materials. Long an exporter in the Middle East, Eastern Europe, and surrounding areas, more recently, Ulker has grown through acquisitions and joint ventures to comprise 58 companies doing business in food, beverages, finance, computers, and electronics.

Ulker recently completed a three-year experiment with an organizational learning practice that started in small facilitated teams. By the end of the third year, 750 people had participated in teams, 100 internal coaches had been certified, and significant business objectives had been met and exceeded. After observing the success of the grassroots teams, senior management embarked on a program that applied organizational learning methods to the re-visioning and realignment of the newly diversified company.

For many years, the performance management system at the Ulker Group companies – developed with much thought and consultation, and operating under the direction of the human resources department – had two goals:

- To ensure the acknowledgment and alignment of the corporate vision throughout the organization
- To ensure that all staff understood and operated according to the company's organizational values

In order to achieve the first goal, we adopted a target-oriented management style. Everyone was evaluated with respect to given job targets. This was meant to build the connection between individual performance and corporate performance. Target-oriented management began with the general manager stating the company targets and setting targets for department heads at the beginning of each year. Department heads in turn set targets for their senior staff, and this was repeated throughout the hierarchy. All the targets were to be SMART (Specific, Measurable, Achievable, Result-oriented, and Time-bound).

In order to achieve our second goal, we practiced competency-based performance management, evaluating people based on predefined competencies for their position. This type of performance management outlines the basic attitudes and behaviors that all managers must possess. The attitudes and behaviors that had helped us achieve success in the past were the

ones we knew we must protect and continue in the future. Areas of individual development and related development plans were determined through competency evaluation.

We had been trying to practice this system for four years, and had some difficulty putting all the structures for it in place. At the same time, independent of this performance management system, many teams had formed within the context of learning organization practices, and those teams were making remarkable contributions to our organization. The appraisal system we had in place was not evaluating the performance of those teams, even though their successes often solved problems that could be leveraged by the whole organization. Nor could our appraisal system account for the work performed that was not covered in a job description, as when, for instance, a manager of one company within our group spent a significant amount of time and energy coaching the team of another company in another city.

When we looked at all this, we knew we needed a system that would recognize the performance of those who were working on teams. The teams and their work were vital to all of us, and we wanted to ensure their continuity. In order to eliminate the difficulties we were facing and to build a practicable performance management system that would support our teamwork, we established our own learning organization team and called it the “Ulker Star Team.” It was composed of eight senior HR executives, our sponsor, Aziz Refig (the human resources coordinator of the Ulker Group), and our coach, consultant Evrim Calkaver.

First, We Listened

The first thing we did as a learning organization team was to meet with the general managers of our companies and ask them what kind of a performance system they would like to have. The responses we got both delighted and disturbed us, because they underlined our responsibility to create a system that would meet their expectations. These general managers felt the system should:

1. Contribute to the overall performance of the company and carry us higher each year
2. Enable us to share company goals with employees and delegate responsibility among everyone
3. Create a positive atmosphere; ; motivate
4. Help us see where we stand before the end of the year and take the necessary actions
5. Be easy to apply
6. Be a valuable management tool

We Adopted a Wider Perspective

Our team began in March 2005 by creating an analysis (a cause-and-effect map) of the current performance system, based on our own knowledge, and taking into consideration the interviews we had done with management and staff regarding the problems of the system. The analysis showed the following to be the major factors causing problems in the application of the system:

- Although we believed our system was well designed, it had not been completely adopted by employees, and performance appraisal was still thought to be an “administrative” task. Monitoring of performance management was mostly expected of the human resources department. The lack of general employee support was hindering the application of the system and causing delays.

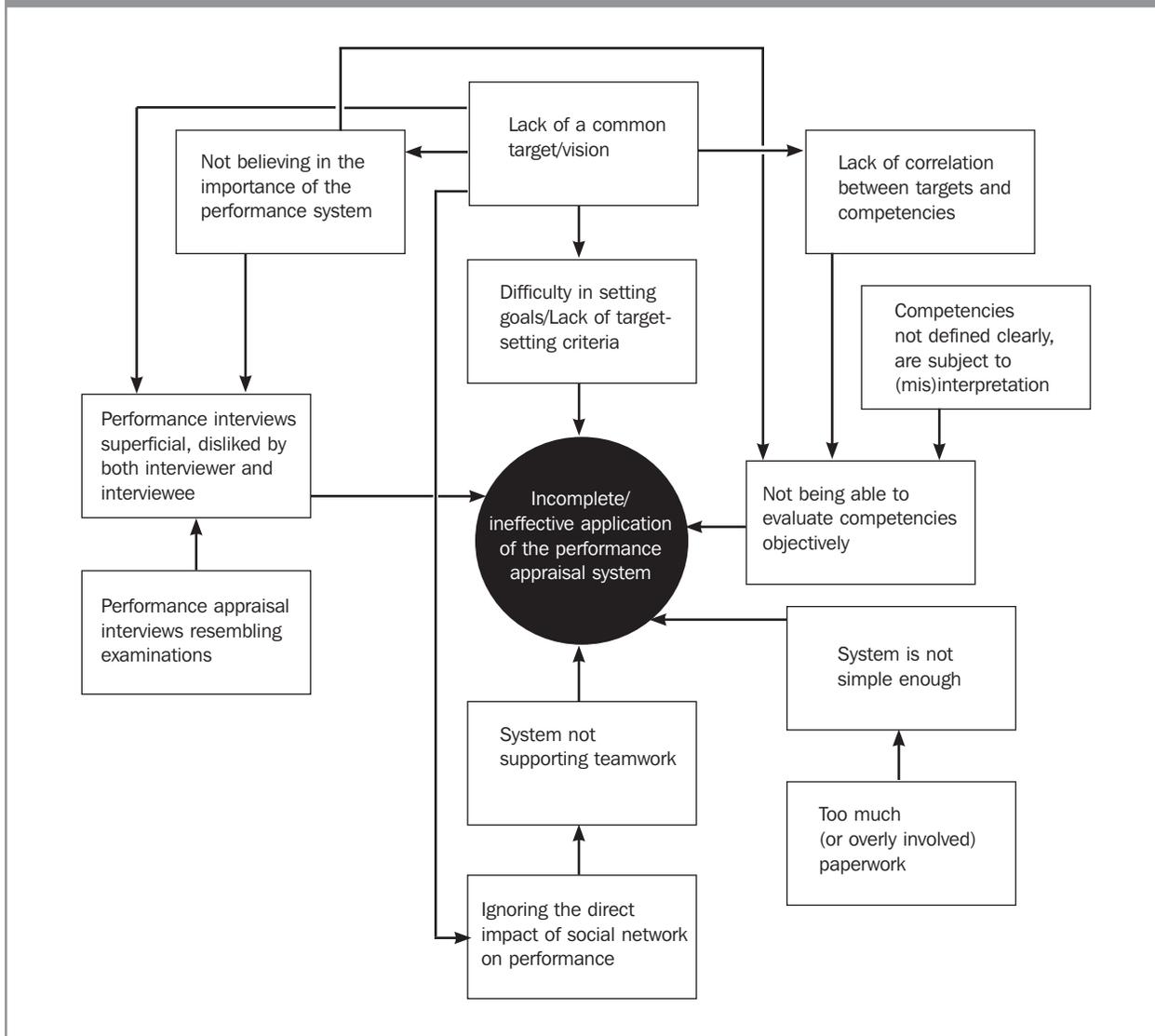
- The performance appraisal system couldn't become a "natural management tool." It was seen as a tool that only enabled the measuring of performance, and was effective only as such.
- The system was based mostly on paperwork, and was naturally perceived as having a complicated, confusing, and displeasing structure.
- The application of the system necessitated a long period of training. Consequently, expanding the system into other companies was a long and slow process.
- Although we had a target-oriented and competency-oriented system, our employees had doubts about the objectivity of the measurement of competencies. We were concerned as to whether the system, instead of supporting the working relationships of managers and their subordinates, might be having adverse effects on them.
- We had difficulty seeing and demonstrating clearly how important a role the system played in supporting the improvement of performance. This was because:
 - Our performance system did not measure team performance, which is vital for improving performance. It evaluated only individual performance.
 - The common targets that we all shared were not defined in the system.
 - Our performance system did not take into consideration who was supporting whom to reach the targets, nor did it support such relationships.
 - The performance interviews resulted mostly in negative feedback. This did nothing to motivate employees. The interviews also felt to the employees as though they were taking an exam.
- Through the learning organization team practices, we realized that forming a team with people from different departments was vital for the success of that team. Successful performance depended on informal relations between employees, and such friendships needed to be encouraged by the performance system. However, our system did not possess a structure consciously developed to support informal relations.
- Finally, in the application phase of the performance system, we, as the human resources department, had situated ourselves as a unit that monitored the schedule of the process and the quality of practices, targets, and evaluations. This would sometimes cause controversies between us and company staff, who saw us as a perpetual control unit. Furthermore, managers' voluntary support of the system was deteriorating.

In the face of all these problems and expectations, our team sometimes felt hopeless and helpless. In such a big organization, continuity was crucial; therefore, it was obvious that any new action had to follow the structure already in place. We couldn't destroy the system in order to reconstruct. We had to create a structure that was based on what we had done up till then. But we didn't have any idea as to how we could accomplish that, nor were there any opinions or suggestions. All we had was our team of eight, a coach, a sponsor, and a vision that we had undertaken the responsibility to realize.

We Questioned Our Mental Models

The operating principles of learning organization team practices proved to be very enlightening for us. We were delighted to see how individuals in those teams came together to accom-

Figure 1: Cause-and-Effect Map



plish things they hadn't been able to do on their own. Because the teams provided a basis for potential to transform into performance, individual performances also began to improve. We saw how employees devoted themselves to the team vision. Behavior such as laying aside prejudices and trying to solve problems by focusing on observable data, using reflective conversation, and directing each other to constructive discussions made us very happy. We observed how easily and smoothly some of the team members' rigid mental models broke down, making way for new horizons, and in the course of all this, how they enjoyed themselves.

Just when we were overwhelmed by the responsibility of realizing the vision and finding a way to set things right, we came up with an idea: Since our own mental models were of little use now, why not start by examining them? At this point, we benefited greatly from the guidance of our team coach. The first mental model we changed was this: Instead of designing a whole new system by ourselves to present to senior management, as we had believed we should, we would try to collaborate with employees. If we could share our vision with the

employees, everyone – not just the eight people on the team – would begin to think of solutions. We thought, “The greater the number of people sharing a vision, the higher the probability of realizing it.” We benefited the most from what we had feared the most.

Acting on this idea, we chose two pilot companies within Ulker, gathered our courage, and told the employees and managers of these companies our problems – to which they responded by letting us know about additional problems within the system, as seen from their point of view. We told them frankly that we had no idea how to solve those problems; that we were asking for help, that we wanted them to join our team so we could all work together on designing a new system. They responded in a courageous way. They accepted the prospect of having their performances throughout that year evaluated within the system we were going to build together. It was really going to be a “live and learn” experiment.

We “Lived and Designed” a New Performance System in Collaboration

In regular meetings with the managers of our pilot companies, we analyzed our problems one by one. The first problems we needed to deal with were the difficulty of setting targets and the lack of a shared vision; the latter greatly triggered the first. Both in our learning organization team and in the operations with the pilot company managers, we saw that the greater the number of people dealing with a problem and the stronger their social network (the more support they received from others), the faster and easier it became to reach a solution. Letting everyone have a say in setting the targets was also very important in reaching them. People tended to assume responsibility for the targets they helped set.

The ideas and other opinions offered to us led us to plan workshops that would bring people together. What we meant by “workshop” was a platform for everyone to freely express their opinions regarding the corporate vision, competency and core targets, and sub-targets. These workshops would encourage people to support one another, to question their mental models, to mirror and question one another, to learn from others’ achievements and mistakes, to appreciate one another, and to share. At the same time, they should create an atmosphere where the participants could relax, have fun, and feel recognized and respected.

We designed our first workshop for performance appraisal planning at the beginning of the year. In this workshop, breaking through our second major mental model, we tried not to include human resources monitoring and managing of the process unless it was needed or requested. We thought that the system should “belong” to those who were responsible for corporate vision and performance. We assigned the leadership of the workshop to the general manager of the company, and monitoring of the practice to an employee/manager who would volunteer to do this job. We called this person the “corporate performance coach.” This person was to coach others with the tools that would originate in this workshop. As for the other managers, they were already responsible for the whole practice. Thus, we had managed to “insource” the performance planning task to our employees and managers.

Our first workshop experience was very satisfactory. In two days, we determined the corporate core targets, the department targets supporting these, and the individual job targets supporting departmental ones. At the end of the workshop, each person had a single-page form on which the core target, the target of his or her department, and the person’s own individual target were written. The result was surprisingly successful. In one of the pilot companies, the general manager hadn’t missed a minute of the two-day workshop, although



he had intended to stay only for two hours. He got his return as targets that would ensure the sharing of his vision by all the employees. One of our financial managers stated that he realized the need to set targets to support the corporate vision in areas that he had never thought of before, thanks to the suggestions of sales managers in this workshop.

The solution had come with a surprisingly simple idea: “The execution of performance management together with all the employees, by the real performers.” Though simple, the idea was effective, practicable, and useful.

The Target-Setting Workshop Had Three Segments

In the first segment, we asked managers to think not only of their own functions but of what needed to be done for the whole company, and suggested that they think mostly about their influence on each other’s actions and how to provide mutual support. The managers accomplished the following tasks under the leadership of the general manager:

- Sharing of the vision by the general manager in a circular session; sharing of managers’ comments concerning the vision and core targets
- Determination of the sub-targets that would lead the company toward the shared vision and particular core target

- Determination of the departments that would be concerned with each of the sub-targets
- Determination of mutual targets that would necessitate teamwork (Learning Organization Team Targets)
- Definition of the crucial activities departments should undertake to support other departments
- Ensuring that all the targets were SMART
- Determination of the competencies

In the second segment, department heads accomplished the following tasks with their department staff:

- Sharing of the corporate vision, departmental targets, and mutual targets – those determined in the previous segment – by the department head; sharing of opinions of the staff concerning those targets
- Determination of the sub-targets that would lead to the achievement of departmental targets
- Connecting of the sub-targets to individuals and determining together the shared departmental targets, if any
- Definition of the crucial mutual support activities
- Ensuring that all the targets are SMART
- Determination of departmental competencies

For this second segment of the workshop, our team also designed an easy-to-follow and amusing handbook.

In the third segment, all the managers and employees came together to review the targets and then organized a party to celebrate their work of the past two days.

In both of our pilot companies, we accomplished what we had set out to do. We saw how smoothly things began to run. All the ideas on the forms used in the workshops had come from the managers, who seemed to be even more excited than we were about our vision. They had even designed some of the forms and structures themselves. One of the companies, after finalizing the targets, sent them to us in a file. On the file was a message that read: “No need to review the targets because we already did; they are all SMART.” We should admit that our managers had grown wiser than us in using the techniques. The other company sent us a detailed and excellent SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis of the system regarding the activities up to that point.

We Followed Up

When the workshops were completed, we had passed the target-setting phase and come to the second critical phase. Companies were asking us how to monitor their progress toward the targets they had set. We went on with our work, executing the performance management process hand-in-hand with the employees. We had not designed a structure for the interviews between managers and employees because we had no intention of monitoring those. All our targets had been designed to ensure relevance and mutual support. We believed that employees and managers would motivate and automatically control each other. The general manager of one of our companies was telling his staff this: “Let’s make sure that our every single act supports our corporate vision. You can be sure that any activity that doesn’t serve our vision will serve our competitors.”

We thought it appropriate to do the follow-up on the developments collectively, again in a workshop. In this second workshop, we brought together all the managers under the leadership of the general manager once more, asking each department head to share departmental activities concerning their targets and their achievements. In the course of this sharing, each manager needed to answer the following questions:

- What are our achievements so far?
- What have we done to come to this point?
- Could we have done anything differently?
- In what way did we support each other?
- How did our activities support our corporate vision?

These questions enabled the sharing of success stories. Furthermore, they helped to give us an insight into the causes of any failures or problems that were experienced. We took great care to choose questions that would encourage positive thinking. Our main objective was to think together, not to question or judge. After this workshop, one of our managers commented, “If we hadn’t held this meeting, I would never have thought that my activities could affect the performances of my colleagues to such an extent. It showed us once again that we can be strong only if we think and act together as one body.”

We had thus completed another phase of our practices. Our pilot companies wanted to have follow-up workshops every four months. We told them to do what they thought was best, after all, it was their system and they knew best what to do and how to do it.

We had now come to the final and most difficult phase of performance management: performance appraisal. Which scale were we to use for the evaluation of performances concerning the set targets? Who was to evaluate team target performances, and how? How would the behavioral criteria for measuring competencies be determined? How were we to decide the level of performance that merited reward? We needed a system of measurement that would simplify the assessment process and, most important, ensure objectivity.

We started with the problem that seemed easiest to solve. We would use a four-point scale: 1 for cases in which no effort was made to reach the target, 2 for cases in which the target had not been fully reached despite the efforts made, and 3 for cases in which the target was reached or almost reached. On this four-point scale, there was no point 4. Instead of point 4, we employed a star symbol to be used only when the target had been surpassed and a success story that had a direct and remarkable effect on the vision had been created. Any employees surpassing the set target would merit a star, and their activities would be recognized and shared by the whole company.

We built our reward system on the belief that for something to be worthy of being set as a target, it had to represent an improvement in the situation. The maintenance of standards cannot constitute a target. Therefore, it would be appropriate to reward the cases in which we were sure that efforts to realize the ambitious targets had been made. Such efforts could provide a basis on which future success would be built and, as such, they merited recognition and encouragement. However, cases of “star” performance were held separately. Those were cases of exceptionally high degrees of success that needed to be highly rewarded. Exceptional rewards for exceptional cases would also serve to support and encourage a continuous pursuit of high performance.

Team performances could not be measured by individual grading. A team meant more than the total of its members. We wanted the general manager, who was usually the team

sponsor, to evaluate team performances using a common grading system for everyone as a whole. The team visions were already clearly known and included measurable targets.

We were almost sure that the targets would be measured objectively. They were all related to each other and to the vision. We had established a significant correlation between corporate performance and individual performances. As a collective evaluation of targets was made every four months, managers would evaluate them in light of those individual and collective performances and how they contributed toward realizing the corporate vision. Our targets were related to measurable and specific areas of practice. The rate of target achievement would automatically determine the grade to be given to the target.

After settling the issue of measuring targets, we took up the harder task of measuring competencies. Competencies are observable behaviors – the knowledge, skills, and attitudes that lead to success. They are the values that enable us to discriminate between high and low performances. Therefore, we needed observable behaviors in order to measure competencies. It took quite a while to establish the behavioral indicators for the chosen competencies. These indicators had to be solid, observable, and clear enough not to necessitate interpretation (so we could avoid misinterpretation). After much consideration, our team determined at least four behavioral indicators for each competency. We shared these indicators with the managers in our pilot companies and heard their opinions. To ensure that the indicators were comprehensible, we asked the employees to read them. Definition and refinement of these indicators is ongoing as field studies progress.

At the end of the whole process, we saw clearly that solidarity and collaboration among the employees of a company were vital to their performance. The employees were mostly aware of the fact that their success in reaching their targets depended on others, on performing tasks to support each other, so they expected the system to help them in getting the required support. For this reason, they put down the names of the units and persons whose support they needed next to each target and made the network of relationships clear for everyone. However, it is not always possible to foresee and define all kinds of support. The network of an employee may include innumerable relationships. We realized that what we needed to do was encourage solidarity among company staff.

To meet this goal, we did two things. First, we decided that teamwork and coaching would be two competencies among the obligatory criteria of the performance system. Second, we identified those employees whose names were mentioned most often within the social network of our company and ensured that they would be recognized and rewarded. In order to identify them, we asked a single question of all our employees: “Who helped you the most in performing your job?” The answers gave us the names of what came to be known as the Ulker Stars of the Social Relations Network.

Epilogue

Our team is now working to expand this practice to other companies in the Ulker Group. We were surprised and pleased to learn that the two pilot companies had, all by themselves, organized the target-setting workshops for 2006 and had identified all their targets. Our system was working. When we asked the companies how they managed to do this, they replied, “How could we operate without planning for the year and setting our targets?” Our system actually had become a “natural management tool.”

When we first started out, we thought we would be quite successful if we could expand the program to six new companies in addition to our two companies in 2006. As of June,

2006, however, this system is being practiced in 23 of our companies, all of which have volunteered to adopt it. This number represents a significant rate of expansion for a performance system. The concept of performance coaching has been one of the major factors in this fast expansion. Managers from the two pilot companies volunteered to be performance coaches in the next six companies. The other coaches we appointed were also volunteers. Only one day of training was sufficient for them to start and monitor the system.

The major factors underlying our success are preferring to “live and learn” regardless of our past knowledge and experience, choosing to act and learn “together” no matter what the task to accomplish is, and trusting our employees. This system has obliged us to review our roles as human resources managers.

Our system is not yet complete; it may even have some deficiencies. However, we are sure that the managers in our companies have really “owned” the system. This ownership ensures their commitment to a continuous effort in developing and improving the system. We believe that we have built a “learning” structure instead of one that “knows.”

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Commentary

By Evrim Calkavur



Evrim Calkavur

The “Learning Organization Practice Teams” process is based on my experiences since 1998 building learning cultures in almost 20 organizations in Turkey, Egypt, and Malaysia.

It is currently being applied by more than 10 companies in Turkey. The Learning Organization Practice Teams transformation starts with small teams working to achieve bottom-line results, with sponsors (top-level managers) supporting the teams. Consultant coaches – I and three of my colleagues – assist in the whole process and support the team members, sponsors, and internal coaches in using the disciplines and tools of organizational learning. The entire process, outlined below, follows four phases over at least a two-year period.

Learning Organization Practice Team Phases

Pilot Projects

- A. Meetings with Top Management (sponsors): Consultant coaches share with sponsors the phases of the Learning Organization Practice Teams process and the time that sponsors (top management) need to devote to this project. After the commitment of the top management to devote this time to the operation, on both personal and corporate levels, the practice begins.
- B. Phase 1 (six months): Two pilot teams are established to work on substantial projects. Those teams, after attending the Learning Organization Practice Teams seminar, come together twice a week for two-hour work sessions. Sponsors visit the teams at least

once a month, and get together with consultant coaches at least once a month. Consultant coaches also attend at least 15 of the team meetings and support the teams and sponsors to use the learning organization concepts and tools. At the end of the third month, consultant coaches organize a workshop at which learning organization concepts and tools are shared with key personnel who have not joined the teams. Sponsors share the company vision, and teams describe their work and ask for support. At the end of the sixth month, the teams present their projects and celebrate the results.

Spreading the Culture in the Organization

- C. Phase 2 (six months): Volunteers from the Phase 1 team are trained as candidate coaches by consultant coaches and teams to work during the second six-month period. Consultant coaches support the internal coaches, teams, and sponsors with monthly meetings.
- D. Phase 3 (six months): Some of the Phase 2 team members are trained as candidate coaches by consultant coaches. New candidate coaches are assigned to work with experienced coaches on newly formed teams. Consultant coaches support the internal coaches, teams, and sponsors with monthly meetings.

Sustainability

- E. Phase 4 (six months): Some of the experienced coaches are trained as master internal coaches by consultant coaches. Master internal coaches are trained to enable the

continuation of the system, to support the sponsors and other coaches, and to train new coaches. Master internal coaches are supported by consultant coaches throughout this phase. During this phase, performance appraisal systems, career planning systems, and other systems should be reviewed to make sure that they support the learning culture being developed.

My colleagues and I have been working with the Ulker companies for more than three years. I assisted the Ulker Star Team for a year in using a learning organization approach and tools to develop their performance appraisal system. It was a different coaching experience for me. I attended more than 50 team meetings in less than a year, and often felt that I was in the roles of sponsor and team member, as well as coach. For me, the Ulker Star Team was not just a team, but *the* team with which to practice and develop the performance improvement model I had been creating in my mind. Their experience with the Learning Organization Practice Teams process is a solid example of the need to integrate learning organization applications into human resources systems. This need is not unique to Ulker: Many organizations we have worked with encounter a similar moment, when it becomes clear that the design of their current performance appraisal system cannot support and sustain organization-wide cultural transformation. It typically comes around Phase 3, when teams have gone through predictable learning pains and begun to celebrate and diffuse their successes. Those successes rely on a kind of cross-boundary teamwork that is rarely recognized in formal evaluations, even when it is making significant contributions to the organization. I had felt for several years

that learning organization work, to be most sustainable, needs to be better integrated with human resources evaluative methods.

Since the Ulker Star Team noted in detail how we built their performance improvement system, I will not cover the same story. Instead, I will outline the aspects of the kind of performance improvement system that supports and sustains a learning culture in organizations. Though this differs somewhat from the system that Ulker developed, it is an example of what can work in many organizations.

1. The focal point of the performance improvement system is the company's shared vision and how to align everyone around it. It starts with workshops in which top management, middle management, line managers, and employees participate. Vision is shared, discussed, and understood, and all the targets are aligned to the company vision.
2. Workshops are designed to create a space for conversation, ownership, and positive feedback. The basis of the performance improvement system is these workshops; it is not the forms or written documents or procedures. Organizational learning tools and concepts are used in these workshops to encourage substantive discussions, to help participants see the bigger picture, and to help workers understand each other with the help of sponsors and Learning Organization Practice Team coaches.
3. The work of the Learning Organization Practice Team members and coaches is recognized as a part of the company operations in the performance improvement system. Team members and coaches are not given any extra reward but they are also not punished for their time and efforts.

4. Reflective workshops every three to four months ensure that there is continuous conversation among different departments and levels of the organization about the shared vision, targets, how to support each other, and how to reflect and learn together.
5. Sharing with, helping, and supporting each other to reach the shared targets and the shared vision is one of the most important aspects of the performance improvement system. It creates space for social networks of performance to expand.
6. Ownership of the system is shifted from human resources to company management. Even the forms to be used are designed by the company management, coaches, and human resources managers working together. Only a few forms are used, so there is no undue burden of paperwork.

Six months after the new performance improvement system was in place at Ulker, managers and human resource personnel were asked to evaluate it. Their comments follow.

Managers

- *Acting together in setting the targets and evaluating the results has made it possible for us to see the whole picture.*
- *It has given us an insight on how we influence each other.*
- *We are getting to know each other's problems, difficulties, and success stories.*
- *Instead of us following up on our employees the way we used to do, now they are following up on us.*
- *Reviewing the performance together has increased objectivity.*
- *Sharing our targets with the general manager is highly motivating.*

- *I can see how my targets and efforts affect the whole picture and it boosts my self-esteem.*
- *We have developed a synergy. While we work on reaching one target, our efforts have positive impacts on many other things as well.*
- *It wouldn't have occurred to us to even work on some of the issues we have accomplished throughout this year if we hadn't talked about them and set targets. Now, we are happy that we have.*
- *While evaluating this year's targets, we also set new ones for next year. This system reinforces itself without our continuous intervention.*
- *This system is perfectly compatible with our "learning organization" practices.*
- *We have become one large team.*

Human Resources Team

- *Instead of evaluating the performance, we focused on improving the performance.*
- *We looked for and brought forward "positive" instead of "negative" and "success" instead of "failure."*
- *We supported a long-term point of view instead of a short-term point of view.*
- *Instead of complex systems which can't be carried out without the human resources department's support, we focused on simple and easy-to-apply systems that can run by managers and employees.*
- *We took "human relations" as a basis instead of "human resources."*
- *Rather than knowing the answers, we learned together.*

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Space Flight Resource Management: Lessons Learned from Astronaut Team Learning

Peter W. Pruyn and Michael R. Sterling



Peter W. Pruyn

Over a period of six years, the Space Flight Training Division of the NASA Johnson Space Center implemented a human factors training program for space shuttle astronauts. Building on concepts from airline Crew Resource Management programs as well as other industries, Space Flight Resource Management (SFRM) has gradually become an accepted method for shuttle astronaut team learning. By no means an easy journey, these six years present many organizational lessons for implementing team learning curriculums. This descriptive paper provides an overview of the SFRM model as well as organizational lessons learned from nurturing its growth. In addition, we explore potential applications to generic team learning and effective group decision-making. By doing so, our intent is to provide readers with a toolbox they can use to build their own team learning curriculum in any organization.¹

Genesis

*"If everybody's thinking alike,
nobody's thinking."*

– General George S. Patton

Take a moment to think of a group decision in which you participated that eventually turned out to be incorrect.

Most likely the decision you recalled did not involve deploying a satellite. In late 1997 during the STS-87 space shuttle mission, a satellite was deployed without first being activated. Initial attempts to rescue the dormant satellite with the shuttle's robotic arm left it spinning freely. A post-flight investigation revealed that the incident was caused by a series of human errors.

Earlier that same year, representatives of NASA's Space Flight Training Division proposed creating a human factors curriculum for astronaut crews based on the Crew Resource Management training currently being conducted by commercial airlines. [See sidebar "What is Crew Resource Management (CRM)?"] For the purposes of this paper, when we

use the term "human factors" we are referring specifically to factors related to the dynamics of group decision making. The Chief of the Astronaut Office, Colonel Charlie Precourt, was a staunch proponent of this effort. Citing examples in Bryan Burrough's book *Dragonfly: NASA and the Crisis on Mir* and spurred on by the STS-87 incident, Precourt believed that CRM-type training for astronauts was something that was long overdue.

Our first step in this effort was to baseline current industry efforts in similar environments. Starting with the airline industry, our instructors visited training departments and asked behind closed doors, "What did you do right and what did you do wrong in the development of your CRM program?" In this confidential setting, lessons learned were shared freely. We gained insights not just into the technical content of their curriculums, but, perhaps ultimately more importantly, into the political and organizational issues that inevitably surround their implementation. It is remarkable how, when provided with an appropriate context, troops in the trenches will value the collective pool of knowledge far and above prestige or economic motive. The airline

industry was followed by visits with representatives of two nuclear power plants.

Based on this research and keeping in mind NASA's environment, we created a human performance model comprised of six "Performance Elements." To emphasize that these concepts apply to far more than just crews who sit in cockpits, we chose the name Space Flight Resource Management as opposed to Crew Resource Management. Three classes were then developed to teach the model to astronauts as well as their instructors: Overview, Applied Methods, and Facilitation.

The SFRM Model

"The nature of the brain is such that we see what we have seen before, and what we have a name for. We are blind to things which have not been properly introduced."

– Wolfgang Langewiesche, Pilot/Author

The SFRM model is comprised of the six Performance Elements arranged in a pyramid (See Figure 2: SFRM Model Summary).

The first class, SFRM Overview, is designed to increase students' awareness of the role that human factors plays in group decision-making. This is accomplished by introducing students to the SFRM model thereby providing them with a shared human factors vocabulary. The class starts with the following definition of SFRM:

Space Flight Resource Management (SFRM) is the exercise of *skills* that are designed to improve the ability of personnel to minimize the occurrence and effects of *errors* by establishing habit patterns that are reinforced by team-centered self-critiques.

We emphasize in this definition that our goal is not to eliminate error; as long as humans are involved, some degree of error is inevitable. However, we believe that teams trained with a combination of technical and human factors skills are better able to

What Is Crew Resource Management (CRM)?

In the 1970s, several well-documented airline accidents were found to be caused by poor decisions made by the crew. In response, during the 1980's, airlines began implementing human factors curriculums for their flight crews. Such programs were initially called Cockpit Resource Management, implying that making accurate group decisions requires effectively utilizing all available human resources.

Since then, CRM has gone through several evolutions. Initially utilizing psychological concepts such as personality testing, the curriculum now usually emphasizes practical techniques for managing human error. The name has also evolved from Cockpit to Crew Resource Management, emphasizing that not just those who sit in the cockpit should be considered as contributing members of the team (Helmreich, Merritt, and Wilhelm, 1999). A more recent application of CRM techniques has been in medical team training (Musson and Helmreich, 2004).

Dr. Robert L. Helmreich, a psychologist at the University of Texas in Austin, is considered by many to be the father of modern CRM. For more information on his group's research see: <http://homepage.psy.utexas.edu/homepage/group/HelmreichLAB/>

minimize the occurrence of errors as well as mitigate their effects. In addition, practicing regular team debriefs is key to establishing these skills as habits.

To provide a context for the usage of these skills, the class introduces the concept of "windows of awareness." We define this as an identified phase of a mission or event where the effective use of SFRM skills is essential to ensure mission safety and success. Any real-time process that requires bringing the team together to focus on an important task can be considered a window of awareness, for example ascent or re-entry in the space shuttle, or a crisis such as a fire.

The diagram below (Figure 1: Windows of Awareness) represents the life-cycle of a mission, from the

design and planning phase, through the training phase, to the operational phase of the flight itself. With this diagram, we depict how windows of awareness appear in the operational environment. We emphasize that these windows are a downstream consequence of previous decisions made either in the managerial environment during the design and planning phase or as a result of choices made during the training phase. We note that the closer we get to the actual operational phase, the less time there is to make decisions. The point is to encourage making accurate decisions as far upstream of the operational event as possible to prevent the operator from having to shoulder the consequences of poor decisions when they will have the least time and resources to address them.

The performance elements are then defined in turn, starting at the bottom of the SFRM pyramid. Each element is further broken down into sub-elements which represent specific skills (see Figure 2: SFRM Model Summary which includes definitions for each element). For many students with primarily technical backgrounds, such cognitive skills are harder to grasp than technical or physical skills. It is true that you cannot, for example, pick up “overload recognition,” hold it in your hand, and look at it. Never-

theless, just like a physical skill, it can be defined, demonstrated, learned, and we can get better at it with practice.

Each performance element is made more concrete using video clips from popular movies, such as *Apollo 13* or *Crimson Tide*. For example, to discuss the command sub-element termed Team Member Authority, a scene is used from *Apollo 13*. The clip shows an Apollo Flight Controller in Mission Control making the difficult recommendation to Flight Director Gene Kranz to abort landing on the moon based on the controller’s expert knowledge of his systems. These videos then serve as a vehicle for class discussion. By watching scenes of teams exercising SFRM skills, students gain the ability to identify such skills for themselves. [For more details about the performance elements as presented in the overview class, see the sidebar “A Discussion of the SFRM Performance Elements.”]

Such classes are designed to be highly interactive and require instructors to draw out as much class discussion as possible. The intent is to give students the opportunity to begin to internalize such human factors skills by relating the examples presented to personal experiences. To optimize such discussions, the ideal class size is considered to be approximately twenty students. With a few exceptions, students overwhelmingly enjoy such classes and feel they are operationally relevant to their work.

The second class in the SFRM course flow is SFRM Applied Methods. Ideally taken some months after a student has had the Overview class, Applied Methods has students practice applying the SFRM model to critique real-world examples of local teams in action. Having students critique other teams serves as a warm-up for students learning to critique their own teams.

The applied methods class defines an effective team SFRM debrief as shown in Figure 2 (see the box “SFRM Debrief Concepts”). Key concepts include the goal of having a “team-centered” debrief. That is, while instructors may be present to help facilitate the debrief, the ultimate goal is to have team members critique themselves with as little help

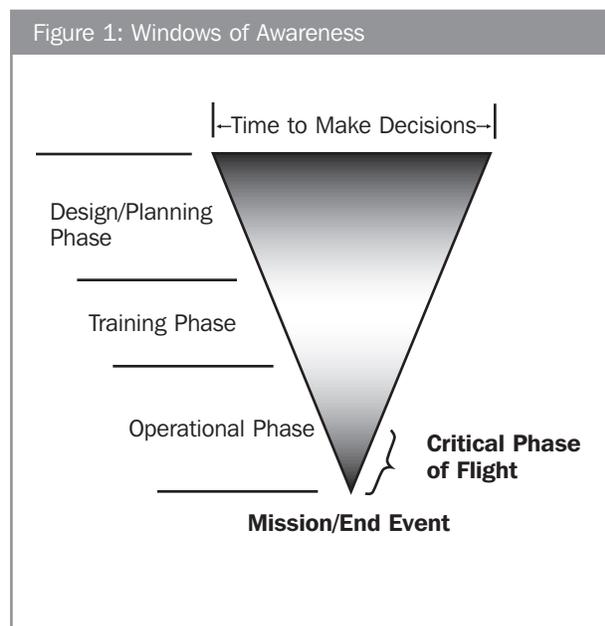
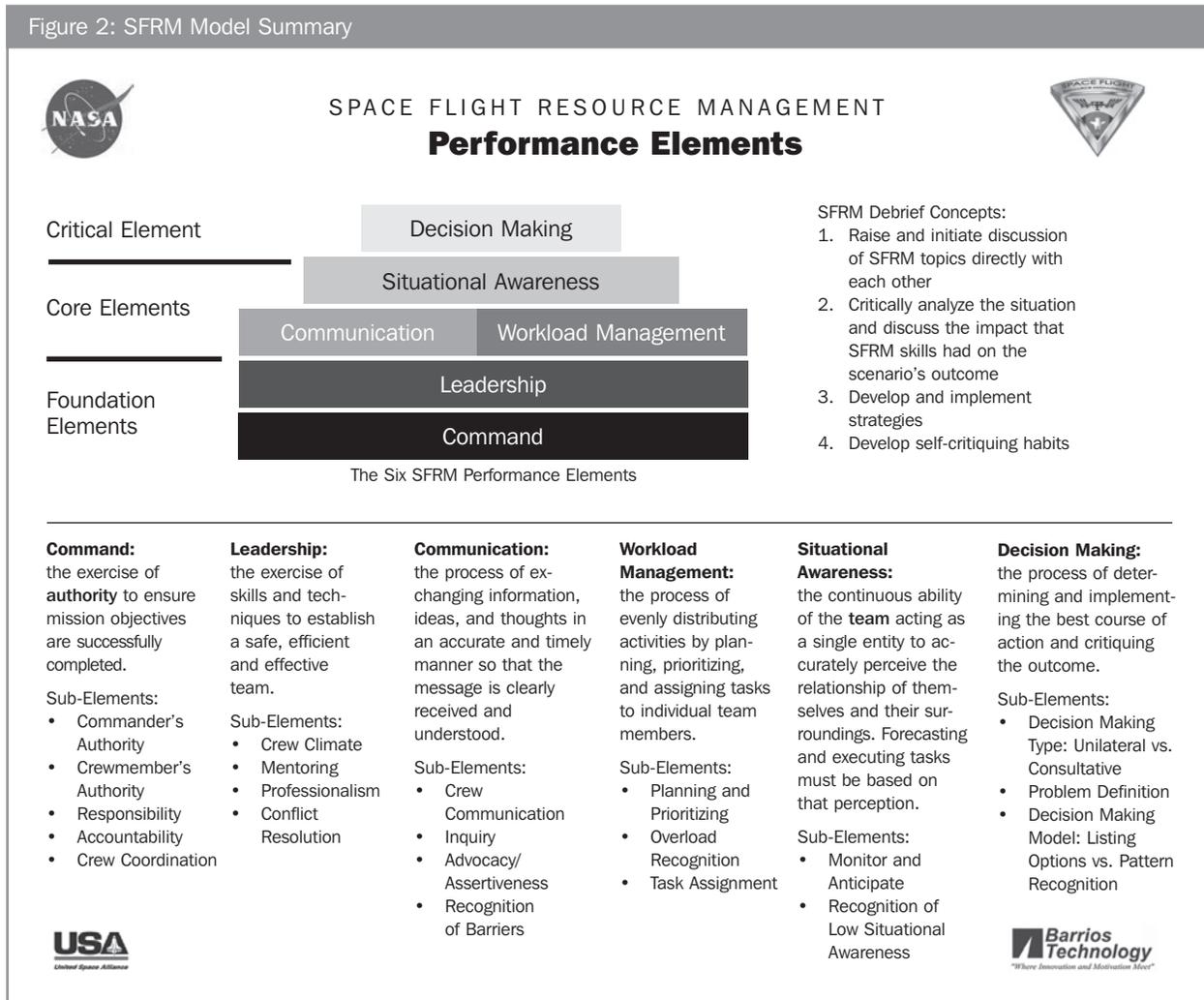


Figure 2: SFRM Model Summary



as possible. While there may be a natural tendency in such debriefs to focus on what went wrong for the sake of avoiding repeating one's failures, it should be emphasized that an effective debrief should also explore what went right for the equally important goal of being able to repeat one's successes.

Just as aviation accident investigators go about aviation accidents by reconstructing an aircraft, one can frame an SFRM debrief as "reconstructing" the parts of a decision. The SFRM pyramid can be used as a roadmap for leading such an investigation by starting at the top of the pyramid and working downwards. Figure 3: Team Debrief, illustrates a fictional example of how this debrief technique might be applied in an organizational setting.

When starting at the top of the pyramid with "Decision Making," we emphasize making a distinction between critiquing decisions versus critiquing eventual outcomes. One can make a poor decision and "get away with it" just as one can ultimately fail in spite of having made what was the correct decision at the time. If you decide not to wear your seat belt to work and arrive without having had an accident, that doesn't mean that you made the right decision. Conversely, if you wear your seatbelt and don't have an accident, that doesn't mean you shouldn't wear it again the next day. Success hides failures; failure hides successes (Catmull, 2004). Whether launching a product or a spacecraft, decisions and outcomes deserve distinct reflection.

The last class in the SFRM course flow is designed specifically to teach spaceflight training instructors to become SFRM observers and debrief facilitators. The facilitation class is given only after an instructor has completed both the Overview and Applied Methods class-

es and has had the opportunity to observe actual SFRM debriefs during simulation training sessions with real crews. The facilitation class gives new instructors the opportunity to practice leading debriefs using other instructors as simulated students.

A Discussion of the SFRM Performance Elements

The first element is “Command,” which we define as the exercise of official authority to achieve a mission (United Airlines, 1998). SFRM also emphasizes the sub-element of team member authority. Team member authority represents the authority of team members based on technical expertise or physical location in support of the designated commander’s overall authority.

Command is contrasted with the second performance element of leadership. We discuss leadership in terms of “people skills to get the job done.” This perspective on leadership does not focus on heroic notions of articulating a vision, inspiring, or the ability to influence. Our point is that leadership is separate and distinct from command. Command is assignable to a single team member. In contrast, any team member can provide leadership at any time simply by exercising certain skills. One can make an analogy to an athletic team: just because there is one team captain, doesn’t mean that she is always the one who is “pushing the ball forward.” Furthermore, just because someone is a good commander, doesn’t always mean that he is a good leader.

Command and leadership are grouped at the bottom of the pyramid and labeled as “foundation elements.” For teamwork to be successful in the long run, it must be based on a solid foundation of command and leadership. Conversely, if a team’s performance is erratic, it may well be caused by problems in either of these two areas.

The next two performance elements are communication and workload management. Effective communication is emphasized as a dialogue, not a monologue. Effective workload management is not just avoiding team members being overloaded. Equally important is avoiding team-members being under-utilized and the associated potential for complacency that comes with boredom. Successful workload management is therefore a continuous, iterative process.

Communication and workload management are placed on the same level of the pyramid to imply a symbiotic relationship between the two. When you get overloaded, what happens to your ability to communicate? It decreases. Further-

more, when someone is overloaded, chances are that reducing their workload will require some purposeful communication: “You look overloaded. What can we help you with?” Similarly, the best antidote for overload is continuous, proactive communication between all team members.

On top of communication and workload management lies the fifth performance element, situational awareness (S.A.). When a team has high situational awareness, they are not only in touch with the reality of their situation, but they do so with the purpose of creating foresight to anticipate future needs. It is important to contrast overall team situational awareness with team member situational awareness. For example, if only one member of a crew sees a warning light but then fails to communicate this fact to the rest of the team, the team still has low situational awareness. This is why we place situational awareness on top of communication and workload management: good team S.A. is dependent on good communication which in turn is influenced by workload.

Communication, workload management, and situational awareness are grouped together in the middle as the core elements. As teams observe their own interactions, skills associated with these three elements are usually the most visible.

Finally we reach what we designate as our critical element, decision making. The quality of a decision is only as good as the perception of reality upon which it is based, hence its placement on top of S.A. SFRM stresses the notion of critiquing as an integral part of the decision-making process. Teams that make decisions without systematically taking time to debrief how well they performed are denying themselves opportunities to learn.

Figure 3: Team Debrief Example

Relevant SFRM Element		
Decision Making	Team Member 1:	“Did we make the right decision to go ahead with the project rollout?”
	Team Member 2:	“No, we should have delayed.”
Situational Awareness	Team Member 1:	“Why did we make the wrong decision? Did we have an accurate awareness of the situation?”
	Team Member 2:	“No, we didn’t realize that the latest test data showed a potential design flaw.”
	Team Member 1:	“Why didn’t we hear about this?”
Communication	Team Member 3:	“I knew, but I didn’t tell you guys in time.”
	Team Member 1:	“Why weren’t you able to communicate with the rest of the team?”
Workload Management	Team Member 3:	“I was distracted with logistics for the Board off-site and fell behind in looking at the test reports.”
	Team Member 1:	“Is there anything we could have done to unload you?”
Command: Responsibility	Team Member 4:	“I didn’t back him up at all when he was working logistics. I could have helped.”
Command: Crew Coordination	Team Member 1:	“O.K., so let’s clarify our roles and responsibilities in backing each other up....”

There are two typical pitfalls of crew debriefs that instructors are trained to discourage. The first is the tendency for the conclusion of a debrief to be: “We’ll do better next time.” While this is a good starting point, instructors need to hold crews accountable to continue the debrief to devise a specific plan for precisely *how* they will do better next time. What specifically will they do differently? Another pitfall occurs when one crew member, frequently the commander, “falls on his sword” by shouldering all the blame for a team failure. While such accountability is also an admirable place to start, crews should again be encouraged not to stop at the assignment of blame but to take the additional step of developing a shared plan for avoiding the error in the future.

Outcomes and Lessons Learned

“It’s not so much that people mind changing; it’s that they mind being changed.”

– Unknown

In the six years since its inception, SFRM has become an accepted component of astronaut crew training and operations.

SFRM classes are now fully integrated into astronaut training flows. New-hire astronauts receive their first SFRM class as part of their initial classroom training and techniques are then continually reinforced during recurrent training. More senior astronauts typically serve as men-

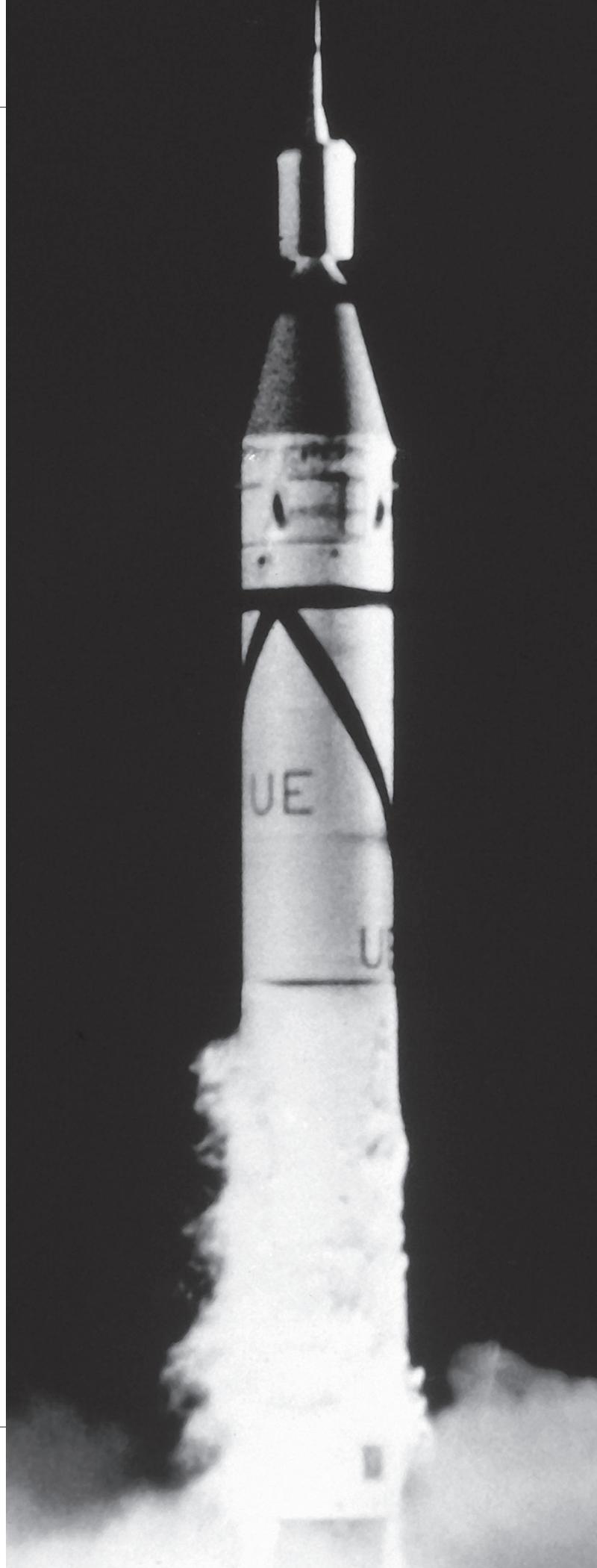
tors throughout. When an astronaut is eventually assigned to a particular mission, the SFRM class sequence is repeated so that the newly forming crew can solidify their own approach to SFRM for the duration of their training as well as the flight itself. Meanwhile, SFRM is ingrained enough in the culture that debriefs are part and parcel of training sessions. Instructor teams have also begun to apply debrief techniques to themselves.

A second target population was flight controllers, the console operators who man the Mission Control Center. A separate version of the Applied Methods class was developed specifically for this audience, emphasizing their role in spaceflight examples as opposed to crew roles. In addition, instructors were chosen to teach this class who have backgrounds in Mission Control. These classes are now integrated into flight controller certification flows, and, in general, are also extremely well received by students. SFRM posters and cheat-sheets are now visible in hallways and control rooms. A recent simulation training session debrief extended twenty minutes simply because the Flight Control Team was asked the surprisingly potent question, “How would you rate your situational awareness over the course of the session?” This prompted several discussions about when team members didn’t know what they should have and why they did not.

As the SFRM program continues to gain credibility and visibility, the Spaceflight Training Division has also begun fielding requests for information from other departments interested in applying such techniques within their own organizations.

Naturally, we have learned multiple lessons from the implementation of the Space Flight Resource Management curriculum. What follows is our “SFRM debrief” of the SFRM program.

The first lesson is an awareness of what it takes to achieve sustainable cultural change in an organization. Astronauts, as a group, are not exactly push-overs, and achieving cultural change for such a population is a non-trivial task. This lesson can be summarized as, “The class is the least important part.”



Organizations, over time, take on the personalities of those who lead them. Therefore, the most important step in successful cultural change is gaining the support of the organization’s authority figure (see Figure 4: The SFRM Implementation Method). In our case, the Chief of the Astronaut Office was squarely in our corner, leaving no doubt that SFRM was a priority for his organization. If the organization’s “commander” supports such an effort, over time, so will the organization. Conversely, we feel that the “bottom-up approach” of trying to lead cultural change from below—while possible—is about as much fun as trying to push a beached whale uphill with a rope.

The second step is having the target population take the classes as outlined above. Such classes seem to be most effective when they are placed at the start of significant events, for example just at the beginning of new-hire training or the start of assigned crew training.

The third step is practice. Teams need regular, organizationally sanctioned opportunities to pre-brief, exercise, and debrief SFRM skills. At NASA, we have the luxury of crews training 98% of the time and flying only 2% of the time. This allows every crew training session, typically one or more each week, to be that opportunity to practice self-critiquing. Initially, instructors will need to be present to help facilitate and provide focus for the debriefs. Hence our instructors take the same SFRM classes as our crews and observe each training session. Over time, however, the goal is to make the instructors less and less needed, all in preparation for the day when the crews will be in orbit and on their own.

The fourth step is the ultimate goal: having SFRM skills become habit. Over time, teams no longer explicitly think of “doing SFRM,” they just end up practicing good SFRM in the natural course of doing their jobs. At that point, SFRM has become integral to the organization’s culture, an essential part of “how we do things around here.”

We will reiterate that of these four steps, the classes are the least important. Some organizations

Figure 4: The SFRM Implementation Method: “The class is the least important part.”

Target Population: The Astronaut Corps	
Step #1: Authority	Chief Astronaut
Step #2: Class	Overview, Applied Methods. For Instructors: Facilitation
Step #3: Practice	Who: Commander & Crew
	When: Every Training Session
	Facilitators: Instructors
Step #4: Skills Become Habit	

tend to regard classroom training as an “inoculation” for organizational problems. In reality, it’s not what students do in the classroom that’s important; it’s what they do after they leave the classroom that really matters. Reinforcement of concepts outside of the classroom comes from one thing and one thing only: commitment. It’s like dieting. It’s not what you do once or twice; it’s what you do every day that makes a difference. Successful cultural change requires a long-term organizational, as well as personal, commitment that must start at the top. It would even be possible for a strong leader to implement such a program without any classroom activities, as long as they led by example and facilitated practice for all team members over the long term.

Having said that, the classroom activities do accelerate assimilation of such concepts to a larger population. This brings us to our next lesson learned: do it right the first time.

We were under pressure to teach our first classes sooner rather than later. We succumbed to this pressure and conducted some of our first classes using weaker fictional team examples rather than more credible, real-world, NASA examples. The initial feedback reflected this. In retrospect, we should not have compromised quality for the sake of schedule. Such cultural change cannot always afford a second chance. Class evaluation forms and discussions with

our students continue to provide us with ways to improve our classes and techniques.

Another early breakthrough was simply telling the target population our expectations. We told crews directly that SFRM would now be a priority for their training and that we expected them to debrief on a regular basis. It worked. While this may be obvious in retrospect, it was not at the time. Crews, reinforced by prompting from instructors, began to focus more on SFRM concepts throughout their training. The placement of classes at the beginning of training flows reinforces these expectations.

Some other lessons initially garnered from our visits to airlines were also revalidated. First, we kept the curriculum relevant to the student population. For astronauts, this means staying operationally relevant. Class examples are, as much as possible, from manned spaceflight. In addition, we avoid human factors jargon as much as possible. The most obscure term in the SFRM model might be Situational Awareness. The last thing a technical audience needs is to be buried in what they consider “psycho-babble.”

Along with that, we have avoided personality testing or role-playing exercises, so-called “parlor games,” in our classes. Personality testing seemed to be a trend in earlier versions of CRM that sometimes left pilots thinking, “O.K., now I know that the guy next to me is a jerk, but what do I do about it?” SFRM emphasizes applied skills that anyone can learn and practice. We chose video examples over role playing because they focus the class on specific skill usage while encouraging students to think in a debrief mindset. It’s easier to learn how to debrief by first observing others than by observing oneself.

The implementation of SFRM was not without its critics. Some older astronauts who had already flown many times reacted defensively. One quote that typified this response was, “No one is going to tell me how to run my cockpit.” Another concern expressed was that SFRM was going to be something that would force people “to talk about their feelings.” Such concerns can be addressed by emphasizing that, no, SFRM is not about telling any Commander how to run their cockpit; it is merely a

toolbox for group decision-making. Teams can still choose to work in different ways, but teams that operate with a shared human factors vocabulary have the added advantage of being able to problem solve in this area.

Those who have been at the organization the longest, who have developed their “own way of doing things,” may be the most resistant to change. Particularly in the beginning, it will be unreasonable to convince everyone in a classroom that SFRM works. However, time is on your side. The stark reality is that these older skeptics will also probably be the first to retire. This leaves you to focus on the newer and newest employees, who are, after all, the organization’s future.

Our experience is that people are more accepting of change if it is introduced gradually over time rather than all at once. We propose that implementing such change is akin to trying to cook a group of frogs. If you drop the frogs in a pot of boiling water, they will try to jump out. However, if you place them in tepid water and then gradually turn up the heat, they will never jump out.

Finally, we must agree with Musson and Helmreich (2004) regarding the dubious value of numeric metrics to evaluate the success of such efforts. In our own organization, the use of metrics is so ingrained that there is a tendency not to believe something unless it can be reduced to a number. Unfortunately, the development of accurate metrics for such an effort will likely require an enormous expenditure of additional resources. We feel such resources are better invested in refining the product itself.

For the skeptics, we propose the following analogy. Does one track metrics for the quality of family relationships? Do parents maintain bar charts depicting dips in their teenager’s morale? No? Why not? Because one doesn’t need numbers to successfully manage human relationships, and that’s exactly what SFRM is: tools for managing relationships. You know when your spouse is angry at you, and if you don’t, having a number probably wouldn’t help anyway. A goal of SFRM is minimizing and mitigating the effects of human error. At its best, precise

SFRM is therefore a non-event. What does one stand to gain from measuring something that's not happening? SFRM observation skills as well as the teams themselves will let you know whether you are having a positive impact or not.

Future Directions

"If you want to keep getting what you're getting, keep on doing what you're doing."

– Dale Carnegie

Our work, and our learning, is never done. There are many other populations, in and outside of NASA, to which we feel SFRM skills are applicable, and we continue to learn lessons from exploring each.

In addition to the operational environment, we feel there is enormous potential for applying SFRM principles to managerial teams. The *Columbia Accident Investigation Board Report* reached similar conclusions, and NASA's Safety organization has developed a similar curriculum for shuttle program management. Some managers, however, may not feel that tools for real-time decision-making in a cockpit can be generalizable to managerial decision-making in a conference room. This leads to the skeptical defense, "That's something for pilots."

There is a select group of individuals, however,

which we feel provide the best validation for our hypothesis: senior astronauts who have learned SFRM in the cockpit and who now hold management positions within NASA. When you watch such individuals run a meeting, you can see them applying SFRM principles in the daily course of doing their jobs. For example, they may take the time to pre-brief a project or special event. They apply SFRM skills during the conduct of a meeting, for example the effective use of Inquiry or choosing between more consultative versus more unilateral decision-making. They may take the time with their peers to debrief an important decision and ask team members to reflect on how the team could have done better, particularly when the team is confronted by a recent blunder.

We propose that the same implementation model can be applied to the managerial realm, or any team environment, for that matter (see Figure 5: Further Implementations). A critical issue will be establishing a regular, organizationally sanctioned opportunity for debriefs. Normally, as soon as a long meeting is over, most participants head for the door. Executing meaningful managerial debriefs will require a significant change in mindset, and, in the short run, more time. It should be emphasized, however, that in the long run, effective managerial decision-making will ultimately save time and resources. An example

Figure 5: Further Implementations

Target Population:	The Astronaut Corps	Any Organization
Step #1: Authority	Chief Astronaut	Head Authority Figure
Step #2: Class	Overview, Applied Methods. For Instructors: Facilitation	Overview, Applied Methods. For Instructors: Facilitation
Step #3: Practice	Who: Commander & Crew	Manager & Team
	When: Every Training Session	Every meeting? Every major mistake?
	Facilitators: Instructors	Instructors(?)
Step #4: Skills Become Habit		

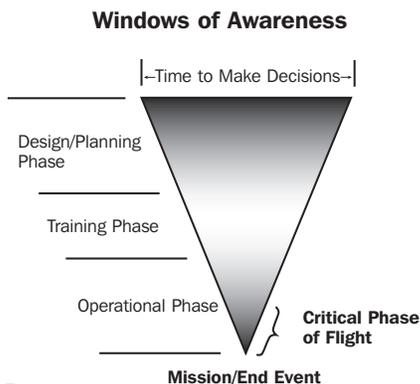
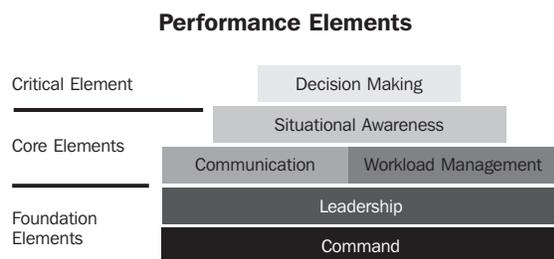
of an SFRM memory jogger for a managerial audience is shown in Figure 6: SFRM Badge for Managers.

Another perspective on applying human factors to technical organizations relates to the notion of safety. Many technical organizations have a safety organization, usually focusing on issues related to industrial safety. In the pursuit of the distinct goal of organizational safety, we feel that pursuing safety in

management as a goal in and of itself is a misnomer. We feel the focus should not be on safety, but on accurate decision making, from which safety is then a natural by-product. If you make safety the goal, there is a tendency to reduce decision-making to meeting a simple metric, for example making a piece of steel tubing stronger by a factor of 1.3. However, focusing on meeting a numeric threshold can give

Figure 6: SFRM Badge for Managers

SPACE FLIGHT RESOURCE MANAGEMENT



SFRM TO PONDER

Decision Making

- Are we adequately critiquing decisions vs. outcomes?
- Are we valuing fact over opinion yet addressing "gut feel"?
- Which is worse: the consequences of delaying this decision to collect more information, or the consequences of making the wrong decision?
- Would our discussion have been any different if a loved one's safety hung in the balance?

Situational Awareness

- Are we actively seeking out dis-confirming evidence?
- Do we all agree on what we will be doing next?

Workload Management

- Is any team member present showing signs of overload?
- Is someone's consistent absence a symptom of overload?

Communication

- If I didn't understand something, did I seek clarification?
- Have I spent more time listening than talking?
- Do I know what the quietest person on the team is thinking?

Leadership

- Is there a climate of openness?
- Are dissenting opinions encouraged?
- Are conflicts resolved with mutual respect intact?
- Do you know that each team member feels valued?

Command

- Are team member roles and responsibilities clearly defined?
- Do all team members have authority commensurate with their responsibilities?
- Is it clear who is in command?

one a false sense of security when the actual context presents other, more significant issues that should be taken into consideration. Even if data is the primary basis upon which a decision is made, ultimately decisions are not based on data; they are based on interpretations of the data. As long as human beings are the ones doing the interpreting, knowledge of human factors can help make the decision more accurate.

Conclusion

“Success is going from failure to failure without loss of enthusiasm.”

– Winston Churchill

The implementation of the Space Flight Resource Management curriculum for space shuttle training began by adapting proven concepts from similar industries to NASA’s organizational culture. Crucial elements of this effort have included a firm commitment from the appropriate authority figure, a sequence of classes that were relevant to the target population, and an understanding that these classes would mean nothing unless reinforced by regular opportunities to practice. The final ingredient has been time. No less than six years have elapsed to evolve these classroom concepts into shared habit patterns among the astronaut corps. Interest in SFRM is now also spreading to other organizations within NASA.

Endnote

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The Managerial Moment of Truth

Bruce Bodaken, Robert Fritz
Free Press, 2006

The Managerial Moment of Truth



Bruce Bodaken



Robert Fritz

The Managerial Moment of Truth provides an elegant method that could have a profound impact on organizational cultures that struggle with the question: How do we speak the truth to one another in ways that work? The four elements are acknowledging present reality; examining people's thinking about how it got to be that way; creating a plan for what needs to change; and establishing a feedback system to track improvement against that plan. As Peter Senge states in the Foreword, "this is not a book with just a bunch of 'good ideas.' It is a call to a simple but transformative practice, one vital to building an organization truly worthy of people's highest commitment."

Preface

Truth is a tricky subject in any context. People rightly ask, what is the truth? How do we know? Are we really talking about truth or opinion? Isn't it dangerous to tell people the truth? Can they take it? Might we harm people by telling them the truth?

These are good questions, and that's why we want to clearly define the areas we are addressing before asking you to dive into a book entitled *The Managerial Moment of Truth*.

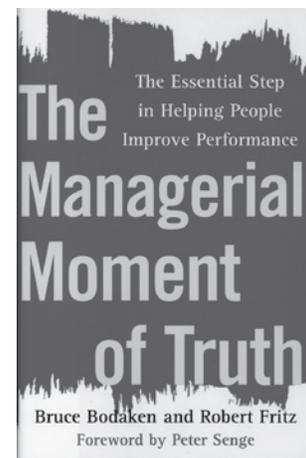
What do we mean by truth in this book? How can we learn to see and then

communicate what is true, and do so in ways that are positive, productive, practical, helpful, and effective?

Before answering these important questions, let us make this claim: *truth is one of the most important competitive advantages there is in building a business*. Truth is the most vital element an organization has in fostering collective learning. When we are able to explore and then tell each other the truth, we can improve our performance, both individually and collectively.

Imagine trying to build an organization without the ability to tell each other the truth. We would not be able to correct mistakes, learn from past performances, adjust our processes, and better understand the reality in which we are engaged. In fact, a glaring statistic is that over 50% of businesses fail within their first three years. The reason they fail is that they don't know what is going on in reality, which may include their financial position, their impact on the marketplace, the nature of their customers' real motivations, and other

key factors. Had they known the truth, they would have had a far greater chance of success. Without perceiving reality, it is next to impossible to succeed because



invariably decisions are made in a vacuum.

Some would argue that human beings are incapable of objectivity because of the nature of perception, which they see as idiosyncratic. We can only understand the world through our senses, which we then interpret. We are left with opinion at best, and, therefore, no one is right or wrong.

These ideas are interesting, and yet they don't hold up to scrutiny. If we look to the aural realm of a musical pitch we can see how similar human perception is because not only can we hear the pitch that is sounding, we can see it on an oscilloscope. If two musicians are playing out of tune with

each other, most people could hear the dissonance. Yet even if they were tone deaf, they could see the actual waveform the dissonance creates on an oscilloscope. In a discipline like music, people don't talk about "my pitch (truth), and your pitch (truth) when they have to play together. There is an objective reality they can understand, and because of that objectivity, over one hundred people can play together in a symphony orchestra, and play in tune with each other.

In this book we talk about truth (small t) as objective, factual, and observable. A due date was made on time or it wasn't. The performance was adequate or it wasn't. The numbers are the numbers.

We also talk about areas that are not so clear cut, questions that may be subject to differing opinions such as acceptable levels of quality, personal alignment within a team, ones capabilities, skills, or attitude. *What is important is the spirit of inquiry we adopt.* We see the process as one of pursuing, as best we can, the actual reality under consideration.

We are not content with simply sharing impressions or opinions. With what rigor do we seek to understand reality, even if what we find contradicts our pet theories, our years of experience, our outlook, philosophy or world-views? Our personal notions notwithstanding, *what is the actual reality and how do we know it?*

The managerial moment of truth approach is one of mutual exploration and learning. Together,

we are backing up and studying reality. "Are you seeing what I'm seeing? Am I seeing what you are seeing? And where we are seeing reality differently from each other, how are we to understand why we are seeing it differently?" Rather than fight it out as to who is right and who is wrong, together, we are dedicating ourselves to observing reality and trying to better understand what we are seeing.

The old chestnut of *The Blind Men and the Elephant* suggests that we can't explore reality, only piece together differing opinions, all of which are valid.

In case you haven't heard the original story for a while here it is: Four blind men encountered an elephant. They began to reach out to touch the elephant to understand its shape. One blind man, who happen to have found the elephants tail said, "An elephant is like a rope!" "No," said another who happened to have put his arms around the legs, "an elephant is like a tree truck." "Nonsense," said another who happened to have found the elephant's trunk, "the elephant is like a hose." Still another one of the men touched the elephant's tusks. "The elephant is like large teeth."

But when we think about it, shouldn't we rename the story *The Stupid Blind Men and the Elephant?* After all, these people were arguing about each person's perception, but they weren't asking each other how it came to pass that they had such vastly different ideas about the object they were examining. The story is

meant to tell us that everyone has a piece of the truth so, even though we may have vastly different ideas, they all reflect an aspect of reality. Perhaps. But an elephant is more than something like a rope, a tree trunk, a hose, and big teeth. These are but elements that are seen from a fragmented and limited point of view. I may have wheels, doors, seats, and an engine, and yet I may not have a car. To understand that we are considering a car, we need to see the gestalt – the parts in relationship to the whole.

Let's change the story to *The Smart Blind Men and the Elephant.* In this story, one of the blind men says, "An elephant seems like a tree trunk," and his friends say, "Okay, keep feeling around and then report what it's like." Over time, the team would be able to describe what an elephant is like by sharing their insights and then further exploring the parts of the elephant that haven't yet encountered, given that the elephant was in a cooperative mood that day.

In management, truth-telling too often has come to mean simply sharing opinions. This is not what truth-telling means in this book. Trading opinions doesn't usually lead to greater understanding. What's missing is the *discipline to understand the foundation of various opinions.* We do that by measuring conclusions against reality. When we are objective, we don't only pick the facts that support our opinions to the exclusion of facts that don't. We are able to look at everything and allow ourselves to change our

minds, alter our impressions, and abandon outdated ideas for ones that fit the facts.

Most of us have been taught to study reality in relationship to our theories, experiences, concepts, ideals, and so on. The thought process then is one of comparison. We compare reality against our ideas about reality. This approach limits our ability to see those things that are inconsistent with our previous notions. When we think we know all the answers, we don't ask targeted questions that enable us to explore new territory. But, if we look anew, without presuming we know the answers to questions under consideration, we can discover new insights and relationships, rethink our assumptions, and go well beyond our basic suppositions. This book explores ideas about how we can look more carefully and see reality for what it is. Seeing reality objectively requires a large degree of rigor. Within the context of the organization, it also requires a process of collective inquiry. How can we bring people into the process? How can we consistently be willing to look at the hard facts? What would motivate us to strive for greater understanding, even when the exploration shines light on our own failings? How can we become better at our jobs and profession? How can we do that as a team and a company?

Telling the truth

Unearthing the truth accurately is one thing. Telling it is yet another

thing entirely. The classic line that reflects many managers' reservations to call it like it is comes from the film *A Few Good Men* when the Jack Nicholson character says, "You can't handle the truth." The general impression most of us have is that the unabashed truth is hurtful and devastating. We have grown up in a society that agrees with the Jack Nicholson character. Yet study after study has shown quite an opposite story – when there is a choice to know the unvarnished truth or not, people would rather know than be in the dark. Psychological studies consistently show that those who are in command of the facts are healthier than those who are not. One such study demonstrated that teenage pregnant girls who were flat out rejected by their families were more able to deal with their situation in a healthier and more productive way than those who, in fact, were rejected, but were never told that directly. The fact is, we need to know where we stand with each other, not only teens in trouble, but managers from every level of the organization. Can people handle the truth? The resounding answer is YES!

Having said that, we need to talk about the real world. The idea here is not just to tell the truth, but have the telling of it be productive, helpful, and lead to a positive change in the future. Telling the truth certainly involves a recitation of facts. But there is much more to communication than some clinical and cold statement of information. Motive

makes a difference. What are we after? What do we want to accomplish? What type of relationship do we want with the people we work with? The book will explore these critical questions extensively and shed light on major distinctions that can make all the difference between long-term success or just a short-term improvement followed by regressing into past unproductive patterns.

We need to make a clear distinction between attempting to manipulate a person, on the one hand, and making a potentially tough conversation as accessible as we can make it, on the other.

The attempt to control the inner experience another person may have so as to get him to do what we want him to is the aim of manipulation. The underlying assumption here is that the person, left to his own devices, would not want to accomplish his goals. And because of that, the manager needs to make the person fall into line. Whether through charm or threats, the manager sees the job as getting a person to do what he hasn't freely chosen to do.

Managers can't build capacity through a manipulative approach because people react by becoming less self-generating. At best they can comply with directives. They cannot truly align with the direction leadership has chosen. This creates profound limitations to growth, development and advancement for everyone.

If we think people can't handle the truth, we soften it. That's a manipulation. Or we sneak in the harsh facts between a series of

compliments. That's a manipulation. Or we try to instill the fear of wrath to create a sense of urgency. That, too, is a manipulation. Manipulation can work to produce favorable results short-term. Long-term the strategy backfires. Manipulation is one of the worse management approaches anyone can take because it undermines a sense of relationship and credibility between the manager and the person managed.

And yet, too often, managers feel they have no other choice if they are to be true to their accountabilities. So, with the best of intentions, they try to find what the market will bear, and then play the game for all that it's worth. The limitations to this approach are these: you can't build capacity over time, and you can't build real relationships with the people you manage.

Manipulation harms relationships. This statement is true in every type of relationship from the most intimate to the most professional. Rather than a sense of authentic relationship, people develop counter strategies such as *don't show all your cards, hold back some level of involvement, don't care, and avoid truthfulness*. Under these circumstances people pretend to have true relationships, but they are simply playing the hand they feel was dealt them. In an unfair game, no one plays fairly.

Telling the truth means finding a platform from which to tell it. Not everyone takes in information the same way as everyone else. As managers, we need to be

sensitive to how best to tell the truth. For example, if we are talking to the chief financial officer, we can easily run through the accounts. But if we need to talk about the numbers with someone who is not steeped in accounting disciplines, we may have to alter what we say, how we explain it,

**We want to
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how quickly we can move through information, and so on. Our change in approach is not a manipulation. Instead, we are varying our approach because we understand that this person cannot understand the financial content we are communicating as easily as would one who is an expert in such matters. When it comes to truth-telling within the organization, we want to be sensitive to how the person we are talking to takes in information, but we never want to soften the truth. We want to make the truth understandable, accessible, and comprehensive. We want to join with the person in an exploration of how the situation is, how it got to be that way, and how we can do better next time.

As managers, we try to find ways to better communicate to those with whom we work. The techniques in this book are not designed as pre-packaged routines

with which managers "process" people. We will describe a particular process we encourage managers to use. But we encourage each manager to apply the techniques in ways that are consistent with the situations she faces. We will present a four-step form, but the form itself comes alive when a manager in the real world applies it to a particular situation with real people. This book presumes that professional managers bring with them critical judgment, thoughtfulness, and practicality. A manager will know how and when to use the techniques in real life.

The musical form of the blues has a fixed structure. Baseball has a fixed structure. Other forms in the arts and in sports have fixed structures. Yet the forms are only the frame for the unique, creative, vital experience that people make of these forms. The same is true for the form we propose in this book. It is not designed to be some rigid tool that is used without regard to the actual people and situations we face. Instead, we offer the techniques in the book to be adopted in the spirit of what you bring to it – your own intelligence, professionalism, good sense, and humanity.

The written page doesn't give us the tonal context we would need to fully understand the spirit in which something is said. We need to hear the sound of the voices to understand the true feeling tone. The book contains dialogues in which there are harsh facts spoken. Often truth contains unpleasant facts, instances of fail-

ures, disappointments, and confusion. While the words can seem harsh the tonality we would like your mind's ear to hear is positive, helpful, objective, and supportive, even while being frank. This book, if read without the sense of humanity we intend it to have, can sound too severe at times. We are not in favor of abusing people by using the truth as an excuse to beat them up. We are in favor of telling people the unvarnished truth in ways that are accessible, kind, and supportive.

We think it is *not* supportive to distort reality just so people do not have to feel badly about situations they have managed. Of course we feel badly when we do not succeed. But feeling badly comes with the territory of being a professional who is reaching to accomplish goals that are not always within one's means. It's appropriate to feel badly when the situation calls for it. Yet, our motive for improving isn't simply to restore a feeling of equilibrium. Rather, it is *because* we want to do a better job, succeed for ourselves, the team, and the organization that we are willing to face the truth, feel whatever we feel, and figure out what we can learn to improve next time out.

The scope of the book includes the individual, work teams, cross-disciplined teams, senior management, subcontractor relationships and strategic alliances. How can we use moments of truth to

improve our performance, productivity, and creativity? How can we work better together? What is the role of the manager in this process? How can the manager enable others to change for the better? These are the critical questions that this book addresses.

Instead of using the often awkward "his and her," we will sometimes use his and sometimes *her*. We are addressing both genders in either case.

The book is aimed at managers from the most senior levels in the organization to those who work on the line. A manager may have a direct report who is also a manager. The use of the term manager in the book is universal, and is not intended to suggest a form of managerial class system. In fact, it is our suggestion that managerial moments of truth can be initiated top-down, laterally, down-up, and across functions.

It is our intention to bring an approach to the manager and the organization that can revolutionize how we work together, think together, and create our future together. The subject of truth, particularly within the organization, is enormously challenging. But it is also extraordinarily worthwhile, positive, and practical. Today, organizations are faced with sudden shifts in marketplace realities, migrating economics, and the lightning speed of globalization. The organizations that are able to deal with these changing realities are the ones that have

the best prospect of survival. Those organizations that cannot "handle the truth" will be left in the dust. Learning how to tell each other the truth, as hard a discipline as it is within the organization, will make all of the difference.

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Change Your Questions, Change Your Life

Reviewed by Lee Salmon



Lee Salmon

I found Marilee Adams' latest book, *Change Your Questions, Change Your Life*, an important and practical read, having previously made good use of her first book, *The Art of the Question*. My eclectic background – as OD specialist, executive coach, environmental scientist, and physicist – has long had me be a believer in the power of questions to shape our thinking, our lives, and our organizations. We see that organizational approaches that focus on creating deep change are directly or indirectly centered in principles of inquiry. I include in this category learning organizations, action learning, appreciative inquiry, open space, and dialogue models like the World Café.

Change Your Questions is a fable through which we learn in an accessible way about the framing and programming power of questions. While the story occurs in a business setting, its lessons are also directed to our ability to think and relate effectively everywhere in our lives,

including our personal relationships. Most striking is the focus not only on the power of questions, but also on the impact of our *internal* questions and self-talk on our external communications, actions, and outcomes.

Marilee calls this Question Thinking. She provides models and methods showing how deeply our internal questions impact thinking, behavior, relationships, and results. The final chapter of the book, entitled "The Inquiring Leader," hints at further work she has developed, with distinctions she calls inquiring leadership and inquiring organizations. What makes the book especially practical is the workbook at the end providing instructions on how to personally apply the seven QuestionThinking tools.

Beyond the concept of Question Thinking, the power of the book revolves around the Learner/Judger mindset model and the recognition that our internal questions consistently express which mental model we are operating from. Marilee claims that every one of us has these two mindsets; the only issue being which one we choose at any given moment. Judger mindset is critical, reactive, committed to being right, looks from its own perspective only, is win-lose, and narrows possibilities. Learner mindset is open-minded, accepting, curious, discerning, thoughtful, looks from multiple perspectives, is win-win, and opens possibilities. A systems

perspective is more natural and accessible from the Learner mindset. Marilee sums up the use of this model by advising us to: "accept Judger and practice Learner."

Change Your Questions, Change Your Life provides a useful graphic, the Choice Map, which illustrates the distinct paths of Learner and Judger and the different worlds of experience, results, and possibilities created by the choice of either one. The Map also shows how to shift from Judger to Learner by asking "Switching questions." While the terms Learner and Judger describe mindsets of an individual, one can also postulate Learner or Judger organizations and Learner or Judger teams. The Choice Map then becomes a tool for working with both. The QuestionThinking approach invites us to consider the intersection of individual thinking and organizational thinking, of individual learning and organizational learning, of individual performance and organizational performance.

I find the Learner/Judger distinctions simple, elegant, and profound. I use the Choice Map in a coaching context, for example, in raising awareness when a leader claims to want to be inclusive and empowering, but whose behavior is critical or dismissive. Clients find it easy to understand and use for increasing their ability to observe where they are and highlighting their choices. The results they achieve often show

**Change Your Questions,
Change Your Life:
7 Powerful Tools for Life
and Works**

Marilee Adams, Ph.D.
Berrett-Koehler Publishers,
San Francisco, CA. 2004.

me that changing their questions from Judger to Learner transforms their thinking and behavior.

Juanita Brown and David Isaacs say they have been using Marilee's work as a "key resource" for the World Cafe since its inception. They've used her work on questioning to help shape successful Café dialogues throughout the world, by showing Café participants how to frame more powerful questions that then become the catalyst for richer dialogues.

Myron Rogers, coauthor of *A Simpler Way*, has this to say about *Change Your Questions, Change Your Life*: "Marilee's Learner/Judger model is incredibly simple, but can hold the complexity we deal with as organizations and as individuals. There are many tools and models out there, but I consider this tool to be fundamental. It provides simple ways to bring people back to simple change and also

helps build an organizations capacity to change itself. I used the Learner/Judger model with a company that had a culture of judgment. I could point out what was happening in the room and ask how that fit the Judger path, building awareness and their ability to make different choices. Focusing on the importance of questions also gives clients an explicit way to understand the importance of the process that leads to outcomes (answers), and places where they can intervene to change the process (by changing their questions). Both of Marilee's books help me explain what I do and give me a language to explain it to others."

For those of us committed to organizational transformation, Marilee's QuestionThinking work raises some provocative questions. One is, "How can we discern the questions that organizations are asking and answering (implicitly and explicitly)

with their behavior – and what implications for deep change might this suggest"? In my opinion, however, the big picture of this work goes beyond the practical importance of questions for individuals and organizations.

At a deep level, Marilee challenges us to take on inquiry as a transformative practice, as a way of being that can fundamentally alter who we are, how we relate and act, and what world we choose to create. This is a pivotal point in history, when many have concerns about a sustainable future. The power of the QuestionThinking perspective is to recognize that needed changes in institutions, government, and culture require new questions to open new possibilities. A renewed level of thinking and dialogue is called for, with the courage of fresh questions to light the way.

Lee Salmon is the practice leader for executive coaching, mentoring, and leadership development with the Federal Consulting Group, where he works with leaders at the highest levels of government. FCG is a government franchise within the Department of the Treasury, serving as internal government consultants for organizational development and change. Lee is also a scientist and physicist and participated in the second SoL global forum in Vienna.

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Reflections

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