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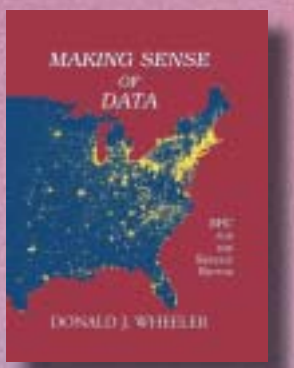

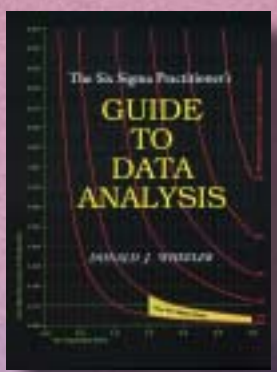

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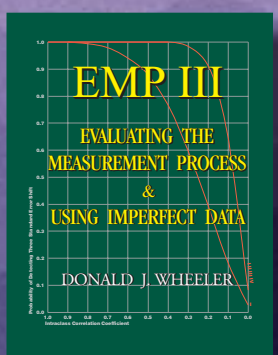

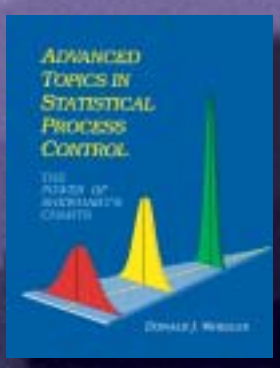

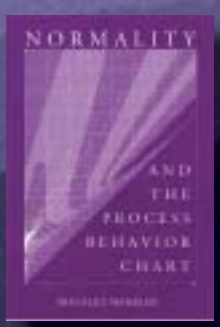

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Culture: Change!

Get in it for the long haul, or not at all

SORRY, BUT CULTURE CHANGE is not something that will happen through sheer force of will. Anyone who's ever fought to change engrained organizational behaviors can attest to that. True culture change is finicky: It requires a clear strategic plan, leadership support, adequate resources, coordinated implementation and lots of patience. Even then, there's the possibility that change just won't stick.

To improve your chances, however, consider following the nine steps outlined in this month's cover story, "Change That Sticks," p. 22. Author Leon Spackman offers sound advice that can be applied to almost any type of organization seeking any type of desired change and hoping to secure lasting improvement.

Take social responsibility (SR), for example—a movement that has become increasingly popular among many organizations. SR is not something that will happen overnight. It requires concerted effort, time, and the education of employees and leadership to change the hearts, minds and behaviors of groups of people.

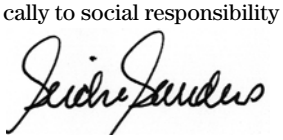
I use the SR example because in April, ASQ will formally launch its SR initiative with an event in Milwaukee. Local business leaders will speak about steps that can be taken in working toward sustainability, and noted photographer Chris Jordan will keynote (for details, turn to p. 16). Invited attendees will walk away with solid ideas they can implement within their own companies.

Another article in this issue, "Know Thyself" (p. 30), might be of help for those working to meet SR-related goals. Author Robert P. Warda discusses the differences between project-centric and culture-centric improvement. Why is it that change doesn't always stick? Warda says it's often because organizations attempt to improve processes either before or instead of improving culture:

"[Culture-centric improvement] is often the elephant in the room that no one wants to bring up," he writes. "It's easy to rally everyone around the quality flag, but it's difficult to face the fact that the organization as a whole, including its leadership, does not always walk the talk."

Spackman agrees: "Permanent shifts in organizational culture must involve all employees, and each employee must have at least a basic knowledge of what is expected and how the change will be accomplished."

Articles, anecdotes and success stories are good first steps for anyone headed down a path toward culture change. Besides the articles in this issue, you can find many more on QP's website, www.qualityprogress.com. More articles and information related specifically to social responsibility can be found at www.thesro.org. QP



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INBOX

Registrar response

I'm writing in response to the letter in the February 2009 edition of QP titled, "True value" (Inbox, p. 8). I'm a certified quality auditor and a certified manager of quality and organizational excellence. I have been performing third-party audits for registrars for the past 10 years.

I find it very discouraging that so many organizations blame registrars for much of what ails modern quality systems. I think my colleagues across the country would agree that registrars range from the very good to the very bad. If you paint all registrars with the same brush, however, that's akin to saying all injection molders or all machine shops are the same. It's a very naive approach.

The author of the letter had some interesting things to say. First, the assumption was made that registrars have the authority to change how they structure the audit-day calculations and the contracts. That is just not the case. Registrars typically do not write their own standards. Any complaint about audit-days calculations or length of contracts should be directed to accreditation bodies, not certification bodies. The accreditation bodies closely monitor the calculation of days and the structure of contracts.

For example, if an organization is a supplier to the automotive industry, the requirements regarding audit time and contracts are set forth in a document issued by the International Automotive Task Force. I would suspect the reason for the author's concern with value-added audits is the strong system his or her organization has in place (because the author mentions the "green" status of its scorecards).

The author's other concern is the value of the third-party audits. I'm getting tired of hearing how registrars do not add value. It is the goal of every registrar and every audit team to provide value to the client organization.

If your company is certified, that means you have employed a registrar to perform audits and issue a certificate should your system be judged as conforming to the standard. This places the registrar in the position of being a supplier and a customer. If registrars did not provide value to their customers, the registrars would not be in business long.

Perhaps those who complain the loudest are on the outside looking in. If you have reservations, then approach management about the possibility of being part of the audit process. I have never denied auditee personnel access to the audit process. I believe that as you gain a deeper understanding of the third-party system, you will tend to be far less critical.

Ernest Blanchard
Lead auditor—ISO 9001, ISO 14001, TS/16949
SGS—North America
Lowell, MI

Career commended

I was deeply inspired after reading Diane Kulisek's Career Corner column, "Make Your Own Luck," in the March 2009 issue of QP (p. 54). Diane spoke from the heart and offered truly sound advice to anyone striving to better themselves. In these challenging times, it is imperative that our reach exceeds our grasp. Or, as my father would say, "To make an omelet, you have to break some eggs." Bravo to Ms. Kulisek!

Peter J. Sherman
Associate Director, AT&T
Atlanta

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First, Do No Harm

Dangerous treatment practices highlight need for change

HEALTHCARE COSTS in the United States are increasing at staggering rates. In fact, last year's employer health insurance premiums increased by 5%, which is two times the rate of inflation.[1]

Have these increased expenditures resulted in improved outcomes? Hardly. Are the higher costs further evidence of a healthcare system focused on reacting to problems (corrective action), rather than preventing disease and illness?

Colon cancer is the second-leading cause of cancer deaths in the United States. To detect preconditions of this cancer and take steps (preventive action) to reduce its negative impact, screening for this condition has become a routine recommendation for those over 50.

I underwent a colonoscopy in November 2007 to screen for the cancer. I received some unexpected, extremely troubling news a few months after my visit to the clinic where the test was performed: There was a chance I had been exposed to HIV, the hepatitis B virus and the hepatitis C virus (HCV) during my brief stay.

HCV is the most common bloodborne infection in the United States. An estimated 3.2 million people are chronically infected with the virus, and there is no vaccine against it.[2] It remains asymptomatic for years in about 60% of cases.

The Southern Nevada Health District (SNHD) began conducting investigations in January 2008 and discovered that beginning in 2004, the Endoscopy Center of Southern Nevada (ECSN) and its sister centers had systematically implemented processes and practices that enhanced the potential for transmitting bloodborne pathogens between patients.[3]

The healthcare service provider apparently had deemed the implementation of basic infection control practices to be a wasteful cost. For instance, when patients needed more anesthetic, the nurses were using the same syringe to dip back into vials.[4] Figure 1 illustrates how the reuse of syringes could have transmitted the virus. Little money would be saved by reusing syringes, but reusing the medicine could save $5 to $10 per procedure, experts estimated.[5] In other cases, bed pads were cut in half so one pad could be used for two patients.

Of the estimated 40,000 patients processed at the surgery centers between March 2004 and January 2008, the SNHD has verified seven cases of acute HCV infection genetically linked to their treatment. An additional 101 cases remain open—these patients are potentially infected with the virus. See a chronology of the events in Online Table 1 at www.qualityprogress.com.

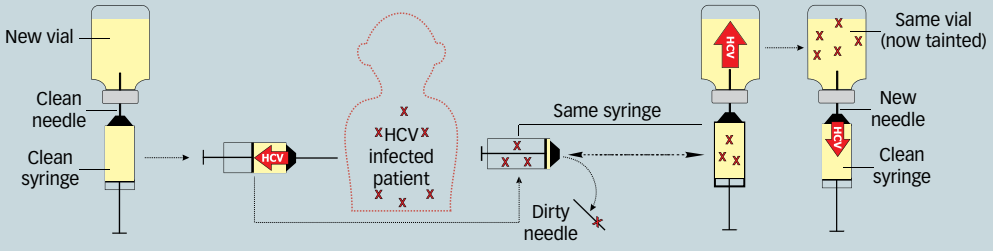
In a mass communication, SNHD began notifying patients who might have been infected and advised them to seek testing. The notification became the largest effort of this type in U.S. history. The U.S. Centers for Disease Control and Prevention recorded this as a 142% increase over nationwide notices in all of 2007.

After these discoveries, the state of Nevada inspected 50 other ambulatory surgery centers and found unsafe practices in 15 of them. Citations were issued, but the patients were not notified of these 15 because the risk was minimal. State inspectors found that technicians who were not licensed were failing to follow the directions of the manufacturer to disinfect and sterilize instruments.[6]

Since the discoveries and investigations, the ECSN has been shut down, along with five sister clinics. Criminal investigations are underway, and the state's medical and nursing boards are investigating the situation, which some nurses say was triggered by the clinic owner's drive for

Unsafe injection practices and disease transmission / FIGURE 1

Reuse of syringes combined with the use of single-dose vials for multiple patients undergoing anesthesia can transmit infectious diseases. The syringe does not have to be used on mulitple patients for this to occur.



1. A clean syringe and needle are used to draw the sedative from a new vial.
2. It is then administered to a patient who has been previously infected with hepatitis C virus (HCV). Backflow into the syringe contaminates the syringe with HCV.
3. A new needle is used, but the syringe is reused to draw additional sedative from the same vial for the same patient, contaminating the vial with HCV.
4. A clean needle and syringe are used for a second patient, but the contaminated vial is reused. Subsequent patients are now at risk for infection.

Source: Southern Nevada Health District 2008

profit at the expense of patient safety.[7]

Among the arguments quality professionals can make for the benefits of a rigorous quality management system is the opportunity for sustainable cost control through the reduction or elimination of errors. Estimating sustainable cost control is an elusive number when compared with processes and practices that focus solely on short-term production costs.

Using my own situation, including the costs covered by my health insurance provider, my 2008 medical costs jumped at least $1,000. That includes doctor visits and double testing due to the incubation period for HIV. The costs do not factor in lost labor—the several hours I spent standing in line at an overcrowded lab facility.

Assuming 50% of the 40,000 potentially infected patients incur a cost of $500 for testing and doctor visits (a conservative estimate), another $10 million in preventable costs will be incurred in this situation. This estimate excludes the costs associated with any lifetime treatments for those people who are actually infected with HCV.

Because my involvement in the healthcare industry is as a customer and not as a technical expert, I rely on that industry and its regulatory and self-regulatory processes to meet "requirements not stated by the customer but necessary for specified or intended use, where known."[8] That includes infection control and whatever specific process steps that encompasses, as shown in Online Figure 1.

To add to the process failures, both the Nevada's regulatory and self-regulatory authorities suffered breakdowns. The state board of medical examiners was slow to implement a peer review of the medical licenses of physicians involved. Unfortunately, the lead investigative physician died during the investigation. He had been assigned to this task while he was suffering serious health conditions about which the board was aware.[9]

Furthermore, the Nevada Bureau of Licensure and Certification had never conducted a routine, full inspection of the ECSN. When asked earlier this year to verify whether the licenses of the surgery centers had been suspended, revoked or canceled during 2008, the licensure bureau reported that the state had not retrieved ECSN's actual Health Division License.

Additionally, both locations still appeared in the online facilities database. Following inquiries, the licensure bureau stated it would be "sending a request to close the facilities in our database."[10]

Become proactive

What can we learn from this troubling trail of events? Certainly, questions remain:

- How can a customer (patient) make judicious healthcare purchasing decisions in a system struggling to perform?
- How can a customer cross the administrative barriers of healthcare financing mechanisms (insurance) to get acceptable medical care with minimal risk?
- What can a customer do to promote a reduction in healthcare costs?

Answers for the quality professional to consider include:

- Pay attention to your instincts. This was a comment someone made to me during my inquiries on their experiences. If something smells like a nonconformity to reasonable practices, it probably is. I certainly heard warning bells during this journey toward the screening procedure, but I kept moving forward, assuming the system was functional at self-policing and regulatory processes were in place to add protective value.
- Use your quality radar in interactions with all medical stakeholders, especially those who are powerful and influential.
- Collect the facts about interactions that concern you.
- Use these facts to file complaints, however insignificant they may seem, with appropriate regulatory and self-regulatory organizations.[11]
- Make your voice for systems improvement known to your legislative representatives. After all, they work for you.

This year, the National Coalition on Health Care estimated the total national costs (lost income, lost household functioning, disability and healthcare costs) of preventable adverse events (medical errors resulting in injury) at $35 billion a year.[12]

It is time for quality professionals, no matter their industry or expertise, to become more active in finding and implementing solutions to healthcare industry process weaknesses. QP

ACKNOWLEDGEMENT

The author thanks ASQ's Las Vegas Section for its support and help with this column.

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JUDITH A. CICHOWICZ is a lead auditor and a consultant. She is also an adjunct faculty member at the College of Southern Nevada. Cichowicz holds a master's degree in geography from Oregon State University in Corvallis. She has held certifications as an RABQSA International quality auditor, environmental management systems lead auditor, occupational health and safety lead auditor and responsible care lead auditor. Cichowicz is the author of How to Control Costs in Your Pollution Prevention Program *(Wiley, 1997), and is a member of ASQ.*

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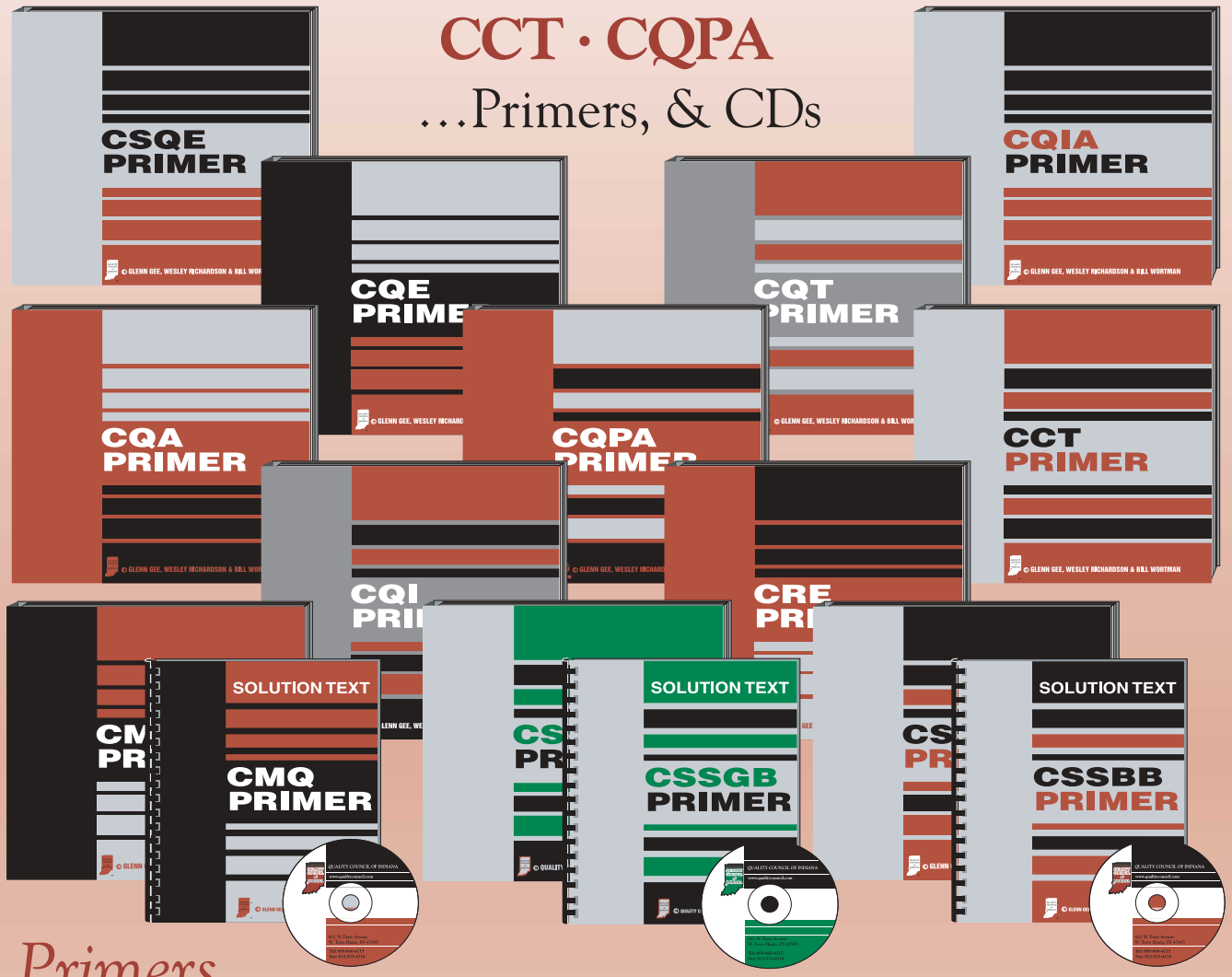

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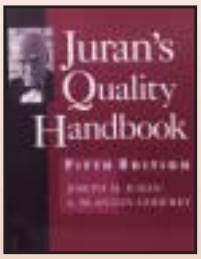

Juran's Quality Handbook $120

by Joseph M. Juran

- The essential quality reference
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The Quality Technician's Handbook $85

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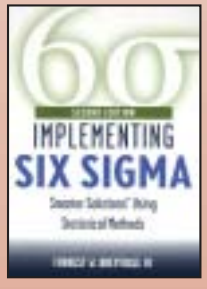

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by Forrest W. Breyfogle III

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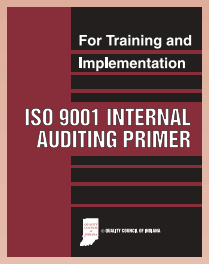

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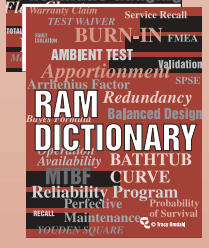

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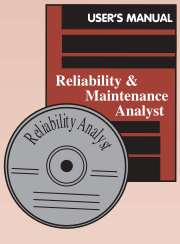

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The QSH details the selection, organization, and writing of quality documents. The disk contains procedures and work instructions. ISO 9001:2008 updated.

EXPERTANSWE

Immediate action

Q: Is it wise for a new quality manager joining an old-school company to perform an audit right away? If so, how should I go about following through with it? My company distributes industrial and specialty gases. I am new to this industry and am finding that when you don't manufacture a product—but rather receive and redistribute it—the areas of opportunity for auditing are limited. Where should I start?

Robert Walkinshaw
Cranston, RI

A: Starting a new job with an old-school company that is primarily in the service industry is certainly an opportunity. Frankly, I'm not sure which is more challenging from a quality management perspective—pushback from an old-school company or pushback from a service company. Mitigating the bigger challenge will be the secret to your longevity at this company.

You said the process of auditing is limited. That statement begs further questions. Are you concerned with auditing because your new company has a quality system? If it has a quality system, you have no choice but to conduct an audit, as you well know. Or, are you interested in auditing because it is your own personal strength? If auditing is one of your key core competencies, then I can understand the desire to perform an audit.

Let's take a look at your question as it relates to the audit. An audit is an assessment—a way to get insight into how things are running compared to some standard. As you get ready for a potential audit, remember a few key points.

First, you are a new employee, and your fellow employees may not know how you do things. Second, the whole notion of formal quality may be new. People may be asking, "Why do we need a quality manager?" Third, don't forget you are putting people on the defensive if you perform an audit.

To that end, you may want to consider some type of self-assessment that can be completed anonymously. This will give you much the same data as an audit. I have used self-assessments in the IT area as a precursor to more formal auditing activities.

The self-assessment may be an acceptable way to assess the state of the company while maintaining your working relationships in the organization. Remember, to be successful in quality, you need to build bridges and develop relationships with your co-workers. Those established relationships are important, because they make it easier to do the hard work that can often get personal.

If you choose to conduct an audit, and there is no quality system in place, you should definitely create an audit checklist that links current problems to the standard against which you will be auditing. Make sure you have consensus on those problems prior to starting. That way, what you are doing is at least linked to issues that are being experienced within the company.

If the real question is how to get started, here are a couple of points to consider:

- Make sure you and your hiring manager are clear on your goals. This may seem obvious, but it's important to point out nonetheless.
- Earlier, I referred to a list of problems. Make sure you address them. Often, a work plan linked to specific problems that clearly shows what you are going to do about them is quite helpful when identifying actionable tasks for the project. This will help you articulate your value proposition. Remember, it is more important to focus on the problems rather than on an approach or method. Be pragmatic about the improvement models and tools so you can make sure you are improving quality by solving problems.
- Review any metrics that might be available. Given the type of company for which you work, you may actually need to start by creating the metrics.
- Lastly, remember you don't make widgets anymore. More importantly, understand that the service for which your customers pay is your new widget. Taking your service and breaking it down into smaller elements is a great way to convert a service process to a measurable process. Once you have done that, you can start reporting on the service. Once you start reporting, you have a place to start focusing improvement opportunities.

Keith Wagoner
Director, continuous improvement
Lincoln Financial
Greensboro, NC

FOR MORE INFORMATION

Kausek, Joe, "10 Auditing Rules," *Quality Progress*, July 2008.
Sittsamer, Murray J., Michael R. Oxley and William O'Hara, "Turbocharge Your Preventive Action System," *Quality Progress*, November 2007.
Russell, J.P., and ASQ's Quality Audit Division, "Improve Your Audit Interviews," *Quality Progress*, March 2006.

Location, location, location

Q: Our company now has three site locations. Does each building need to be ISO 9001 certified or can all buildings be under one certificate? Each building does something different.

Deborah Malboeuf
Quality systems manager
Tosoh SET
Dublin, CA

RS

To be successful in quality, you need to **build bridges** and develop relationships **with your co-workers.**

A: There is no requirement for each site to have its own certification. It is common practice to have multiple sites under one certificate. It is not an issue that the sites make different products or have different functions, as long as they share a common quality system.

The quality systems don't need to be exactly the same at each site (they rarely are). In that case, you just need to describe any differences among the sites in your documentation.

For example, the sites may use different software packages to track certain performance measures. That is acceptable as long as the approach management takes with the information at each site is common and meets the requirements of the standard.

Also, it should be noted you do not need to bring all sites under the certification at one time. You could pick the most ready site and get it certified, add a second to the scope of certification at a later time and the third after that.

The degree to which the sites share a common quality system will affect audit planning. That will be a discussion for you to have with the registrar you have chosen. You will work together to develop an audit agenda that ensures complete coverage of the sites and any of their quality system differences. If you haven't chosen a registrar yet, have this discussion with more than one and take it from there.

If you would like further guidance, several authors have analyzed the ISO 9001 revision,[1] or you could visit the International Organization for Standardization's website. For your specific issue, you should review question 54 of the "FAQs on ISO 9001:2008."[2]

Peter E. Pylipow
Senior design excellence engineer
Vistakon—Johnson and Johnson Vision Care Inc.
Jacksonville, FL

REFERENCE AND NOTE

1. For more on ISO 9001:2008, see John E. "Jack" West's article on p. 38 of this issue of *Quality Progress*.
2. International Organization for Standardization, "FAQs on ISO 9001:2008," www.iso.org/iso/iso_catalogue/management%20_standards/iso_9000_iso_14000/iso_9001_2008/faqs_on_iso_9001.htm.

FOR MORE INFORMATION

Hunt, Lorri, "Energize Your QMS," *Quality Progress*, October 2008.

On the fly

Q: How do you maintain quality when management changes the way things are done daily and forces you to use methods and tools that are new, untried and don't work?

D. Bruce Lapham Jr.
Production test inspector, 787 program
The Boeing Co.
Everett, WA

A: First of all, try to understand the reasons for management to make changes to the way things are done on a day-to-day basis. Try to talk to someone in management to find out what motivates management to make frequent changes. Once you know this, it might be easier to figure out ways to deal with those changes.

Regarding your problem of being forced to use tools that are new, untried and don't work, you might want to collect results achieved through the use of those tools in terms of what management can understand, such as time and money.

If you think other methods of your choosing would have worked better, then somehow you must figure out a way to compile comparative results and show them to management. This is the best way to illustrate why your way of doing things is better than theirs. Most managers can be convinced one way or the other by facts and hard evidence to which they can relate.

I would recommend an excellent article, "Helping Leaders Lead," by Larry R. Smith, which was published in the fall 2008 edition of the *Quality Management Forum* (Vol. 34, No. 4). It's full of ideas that could help you in your situation.

Pradip Mehta
Principal
Mehta Consulting LLC
Coppell, TX

FOR MORE INFORMATION

Folkerts, Timothy J., "The Quality Diet: Building a Healthy Business," *Quality Progress*, May 2007.
Palmer, Brien, "Selling Quality Ideas to Management," *Quality Progress*, March 2006.

ASKED AND ANSWERED

Sooner or later, everyone runs into a problem they can't solve alone. Let us help. Submit your question at www.qualityprogress.com, or send it to editor@asq.org, and our subject-matter experts will help you find a solution.

SOCIAL RESPONSIBILITY

Portraits of Consumerism

Photographer stirs emotion with depictions of waste, social issues

While some people recycle their soda cans and tote reusable grocery bags, photographer Chris Jordan hopes his photographic art inspires consumers to think about the big picture of social responsibility (SR) and what effect their actions—or inaction—can have the environment and the world.

"My belief is, if we can feel these issues more deeply, if we can feel our rage or anger or grief—whatever it is ... I think we would feel very differently than we do now, and we might be moved to act in a different way," said Jordan, who will speak at an ASQ event on SR on April 22 in Milwaukee.

Jordan, a corporate lawyer who became a full-time photographer in 2003, began photographing American mass debris somewhat by accident. His early photos centered on color theories and he didn't intend them to be commentary on consumerism. He was more concerned about aesthetics.

"I'd go out looking for this specific kind of color. One of the places where I found this color and where I took a lot of photos was the industrial port of Seattle," he said.

Jordan was drawn to photographing things such as rusty rail cars and shipping containers. He eventually brought one of his photos—a giant colorful garbage pile—to his office and hung it up. Friends talked about how well the photo depicted consumerism.

"I started reading about consumerism and discovered there is this vast body of knowledge that has been out there for 100 years," Jordan said. "I had this waking-up process. It has been under my nose, but I've never faced up to it for years."

> "If we can **feel these issues more deeply** ... when we can really know these issues, I think we would feel very differently than we do now, and we might be **moved to act in a different way.**"

JORDAN

Jordan's early works involved straight photographs (images unmanipulated by the artist), such as the pile of garbage, which make up his "Intolerable Beauty" series. "The idea behind that series was to capture the scale of our consumption," he said.

From there, Jordan moved on to making collaborative artwork rather than straight photos, which he believed didn't always realistically portray the country's consumption.

Now, Jordan takes a statistic—for example, 106,000 aluminum cans are used in the United States every 30 seconds—and shoots about 500 photos and builds them into a bigger image to depict just how much Americans use. Other photos in this series, "Running the Numbers," center on statistics involving objects, such as plastic bottles, light bulbs and packing peanuts.

Jordan also uses photos to illustrate social issues. For example, one work displays 200,000 packs of cigarettes, which is equal to the number of Americans who die from cigarette smoking every six months.

Through his photography, Jordan said he hopes to illustrate the phenomena that underlie these statistics so it allows for more feeling. "These numbers are so big, our minds can't comprehend them," he said. "If we can't comprehend the numbers and that's the only information we have, then that means we can't comprehend the phenomena. It's my hope to take these statistics and translate them from the cold, unfeeling language of huge numbers into a more universal language that allows for some feeling."

NOTE

Information about Chris Jordan and his photographs can be found at www.chrisjordan.com.

—Nicole Adrian, contributing editor

ASQ TO HOST SOCIAL RESPONSIBILITY EVENT

Chris Jordan will keynote the ASQ Social Responsibility (SR) Launch set for Earth Day in Milwaukee. He plans to showcase photos from the "Intolerable Beauty" series and discuss how he developed the "Running the Numbers" series. The April 22 event is part of ASQ's initiative to align SR and quality principles, and promote the business case for SR and the role of quality in maintaining a competitive advantage.

FOOD SAFETY

Survey: Consumers think food industry isn't doing enough

The food industry may be doing its part to follow safe production procedures, but most consumers don't feel it's enough, according to a recent ASQ/Harris survey of U.S. adults.

"The United States, overall, does have a safe food supply," said Steven Wilson, a member of ASQ's board of directors and an ASQ food safety expert. "However, whether food manufacturers have process controls in place or not, some have plant sanitation issues that they need to address."

Among the findings of the survey of more than 2,000 consumers:

- 93% said food manufacturers, growers and suppliers should be held legally responsible when people die from tainted food.
- 61% said food recall processes in the United States are fair or poor.
- 73% said food safety concerns them as much as the war on terror.
- The food industry should be required to follow international standards on food safety, 82% said.

The survey also addressed the government's role in food safety. Eighty percent said they believed the federal government should select the agencies that inspect the facilities of food manufacturers—not the manufacturers themselves.

Less than half said they trusted the government's ability to ensure the safety of food products. Half of those surveyed said they thought the government was doing a good job enforcing laws related to the food supply.

For more specifics on the survey results, visit www.asq.org/media-room/press-releases/2009/20090311-food-safety.html.

WORLD CONFERENCE

Walk the Walk

Speaker: To regain trust, government, business leaders must 'go overboard,' live organizations' values every day

To regain the confidence of those in the public who have become suspicious or distrustful because of today's economic woes, leaders in business, government and politics must "go overboard" and live out what their organizations' values and guiding principles actually mean, according to one of the keynote speakers scheduled to appear at ASQ's World Conference on Quality and Improvement (WCQI) next month in Minneapolis.

"You earn trust every day. Every action you take says who you are. Every decision you make says who you are," said Howard Behar, the former president of Starbucks North America and Starbucks International.

"People watch what (business and government leaders) do. They don't care as much about what you say, but they certainly watch what you do.

"There's no way to regain (the public's) trust (following today's economic turmoil) except one step at a time," Behar said.

Leaders also must be truly committed to following through on initiatives touted to improve the organizations, such as social responsibility (SR), said Jerry Greenfield, the co-founder of ice cream giant Ben & Jerry's Homemade Inc., and the president of Ben & Jerry's Foundation.

Greenfield is also slated to speak at WCQI.

Some leaders, for instance, may see SR as a feel-good way to gain public favor or score points with special interest groups. Without a true commitment and belief in what SR means and what it can do, time and effort is wasted, Greenfield said.

BEHAR

GREENFIELD

"If business leaders aren't really interested in adopting social responsibility, if it's not something that they personally believe in, then they shouldn't do it," Greenfield said.

"If you try and incorporate something into your business that you don't believe in, whether it happens to be making social responsibility a part of your culture or believing in high-quality products or safety as an essential ingredient in what you do, then it doesn't work," Greenfield said.

Often, the ideas can come from throughout the organization, but the commitment needs to come

(CONTINUED ON P. 18)

THE NUMBER OF ORGANIZATIONS that have been accredited recently under a new American National Standards Institute (ANSI) program that addresses the inventory and reduction of greenhouse gases (GHG) from the environment. The organizations are:

- Advanced Waste Management.
- Bureau Veritas Certification North America.
- First Environment.
- NSF International Strategic Registrations.
- Rainforest Alliance.
- Ryerson, Master and Associates Inc.
- SGS Environmental Services Inc.

Through the ANSI accreditation process, the organizations' efforts to inventory, report and reduce GHG emissions were validated and the organizations' assertions about emissions were verified.

ASQ Conference Preview

(CONTINUED FROM P. 17)

from leadership, and it needs to be unrelenting and uncompromising," Greenfield said.

Listen to more of the interviews with Behar and Greenfield at http://wcqi.asq.org/speakers/keynote.html#behar.

Four in one

In addition to the presentations, workshops and other activities at the WCQI, organizers have planned three "mini-conferences" to be held concurrently.

These conferences will address quality and software, healthcare and sustainability.

One registration fee covers admission for all conferences.

Software: ASQ's Software Division will host its first Institute for Software Excellence (ISE) conference. The ISE conference will feature presentations and networking opportunities. Organizers have also scheduled half-day, on-site tutorials Sunday, May 17, the day before the full conference begins. Visit www.asq.org/conferences/institute-for-software-excellence/index.html for details.

Healthcare: This year's Quality Institute for Healthcare will build on the theme "Building Better Performing Delivery Systems." For details, visit http://qihc.asq.org.

Sustainability: The Quality in Sustainability conference will provide opportunities for quality professionals to plan and implement quality in their sustainability strategies. Visit www.asq.org/conferences/quality-in-sustainability/index.html for details.

STANDARDS

NEW HARD-COPY BROCHURE PROMOTES BENEFITS OF ISO 9000

The International Organization for Standardization (ISO) has published a new hard-copy version of its *Selection and Use of the ISO 9000 Family of Standards* brochure. The brochure includes examples of the integrated use of the ISO 9000 family of standards in the following manufacturing or service organizations:

- A metal parts fabricating company.
- A welfare agency.
- An electrical appliance manufacturer.
- A chemical processing company.
- A computer software developer.
- A bank.
- A franchise organization.

The brochure provides an overview of the standards in the ISO 9000 family and demonstrates how, collectively, they form a basis for continual improvement and business excellence. In addition to the user examples, the brochure includes sections on the following topics:

- A description of the ISO 9000 core series standards.
- A step-by-step process for implementing a quality management system.
- Maintaining benefits and continual improvement.
- The future of the ISO 9000 family.

The brochure was written by ISO technical committee 176. The ISO 9000 family currently consists of 17 international quality management standards and guidelines, and a compendium.

The hard copy is free from ISO at www.iso.org/iso/publications_and_e-products.htm. There is a fee for postage and handling of bulk orders, however. It is also available from ISO national member institutes, including the American National Standards Institute (www.ansi.org) in the United States. An electronic version can be accessed free of charge on ISO's website.

ASQNEWS

SMEs FOR CCT BOK Subject matter experts (SME) are needed to craft practice questions for ASQ's certified calibration technician (CCT) body of knowledge. To maintain the integrity of the certification exams, organizers want contributors who have not participated in writing an actual ASQ exam within the past two years. The questions formulated by the SMEs will be used to help others prepare for the CCT exam. For more information, contact Kate Berumen at kberumen@asq.org.

NEW CERTIFICATION Exam applications are available for ASQ's newest certification, the certified pharmaceutical good manufacturing practices professional (CPGP). The pilot certification exam will be administered May 17 at ASQ's World Conference on Quality and Improvement in Minneapolis. The first official exam will be administered June 6 at ASQ local section sites and at more than 80 international locations. The exam will be offered annually in June and December. The cost is $230 for ASQ members and $390 for nonmembers.

FELLOW NOMINATIONS The deadline to nominate an ASQ senior member to become an ASQ fellow is May 4. To learn about requirements and other information, visit www.asq.org and click on "About ASQ." Open the tab titled "How We Do It" and go to Governing Documents to find policy G 02.02.

ASQ IN LATIN AMERICA The first Latin American ASQ Conference was held Feb. 11-12 in Juarez, Mexico. The event included four keynote speakers, including former ASQ President Jerry Mairani, 24 alternative events and sponsorship booths. About 900 people attended.

ONLINEONPAPER

QUICK POLL RESULTS

Each month at www.qualityprogress.com, visitors can take a short, informal survey, and we post the results.

Here are the numbers from a recent Quick Poll:

"How extensive are your organization's social responsibility efforts?"

- We've made a few changes to become more socially responsible. 42.3%
- We haven't done anything different. 28.8%
- We've made major changes to become more socially responsible. 28.8%

Answer the most recent Quick Poll question posted:

"What is most important when it comes to securing lasting change within an organization?"

- Committed leadership.
- Workforce buy-in.
- Adequate resources.
- The right people to drive the change.

EDITOR'S PICKS

QP's editors regularly scour past issues and find "must read" articles. Find these most recent choices under the "Topics" tab:

- "Energize Your QMS," Lorri Hunt, October 2008.
- "Adapting to Troubled Times," Michael D. Nichols and Karim Houry, January 2009.
- "Driven By Metrics," Duke Okes, September 2008.
- "The True Test of Loyalty," Bob E. Hayes, June 2008.
- "Geared Toward Innovation," Søren Bisgaard, September 2008.

Mr. Pareto Head

BY MIKE CROSSEN

ASQ

ASQ BOARD ANNOUNCES NINE AWARD RECIPIENTS

ASQ's awards board has announced the winners of its national awards for 2008:

Distinguished Service Medals: Ronald G. Kingen, president of Balance Engineering, Racine, WI;

Navin S. Dedhia, quality management consultant, Hitachi Global Storage Technology, San Jose, CA.

Feigenbaum Medal: Jeroen de Mast, principal consultant, IBIS UvA, Amsterdam, Netherlands.

Grant Medal: Lawrence S. Aft, director, continuing education, Institute of Industrial Engineers, Alpharetta, GA.

Juran Medal: Horst Schulze, president and CEO, West Paces Hotel Group LLC, Atlanta.

Lancaster Medal: Alberto Miller, director, international education, Broome Community College, State University of New York, Vestal, NY.

Shainin Medal: Jane L. Hoying, manager, Shanin LLC, Livonia, MI.

Shewhart Medal: Roger W. Hoerl, manager, General Electric applied statistics lab, Niskayuna, NY.

Brumbaugh Award: Søren Bisgaard, professor, Isenberg School of Management, University of Massachusetts-Amherst, Pelham, MA.

For more information on ASQ awards, visit www.asq.org/about-asq/awards.

Who's Who in Q

NAME: W. James Bover.

RESIDENCE: Scotch Plains, NJ.

EDUCATION: Doctorate in analytical chemistry from Clarkson University in Potsdam, NY.

CURRENT JOB: Business and controls adviser at ExxonMobil Biomedical Sciences Inc. since 2005. He has worked at ExxonMobil for more than 30 years.

BOVER

INTRODUCTION TO QUALITY: In the early 1980s, Bover performed technical support visits to his company's lube-oil blending plant laboratories. The visits eventually shifted focus toward quality assurance (QA) and quality control (QC). In 1983, he joined American Society for Testing and Materials International (ASTM)—Committee D02 on Petroleum Products and Lubricants to help develop standard methods for the industry. This led to developing a working knowledge of statistical quality control techniques.

ASQ ACTIVITIES: Bover is a senior member of ASQ, having been a member since 1996. He has been active in several ASQ sections, and he is a certified quality auditor.

OTHER ACTIVITIES/ACHIEVEMENTS: Bover achieved the rank of colonel in the U.S. Army Reserve and New Jersey Army National Guard. In 1989, he authored a laboratory QA practices document that has evolved into a primary laboratory QA standard at Exxon and ExxonMobil. Starting in 1988, he led the development team within ASTM Committee D02 that initiated an international cross-check program to evaluate interlaboratory precision. Bover continues to chair this program, which now covers more than 20 petroleum and lube products and has more than 1,500 participating laboratories worldwide.

From 2001 to 2005, Bover was section head of data integrity and QA, which was responsible for planning and conducting QA/QC assessments of ExxonMobil refinery labs and lube-oil blending plant labs worldwide. During his career, he visited more than 40 countries and hundreds of laboratories in support of QA activities.

Since 2001, he has served as the chair of ISO/TC28 on petroleum products and lubricants committee. He has also served as chair of ASTM D02 on petroleum products and lubricants committee from 2000 to 2005.

PUBLISHED WORKS: Co-authored "Bias Management and Continuous Improvements through Committee D02's Proficiency Testing," *ASTM Standardization News*, June 2005, and "Proficiency Test Programs—Impact on Analytical Test Methods Used by the Petroleum Industry," Eastern Analytical Symposium, Somerset, NJ, 2006.

RECENT HONOR: 2008 ASTM International Committee D02—the Lowrie B. Sargent Jr. Award.

FAMILY: Married with four children.

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Change
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Nine steps to make process improvement permanent

By Leon Spackman

In 50 Words Or Less

- Process improvement is important to the profitability and success of any organization.
- There are nine steps an organization can take to ensure process improvement lasts.
- A government intelligence organization followed these steps to improve the way it served internal customers.

PROCESS IMPROVEMENT is gaining more attention as organizations face budget cuts, competition from developing markets overseas and a challenging economy. Quality methods, such as lean, Six Sigma, ISO 9000, Capability Maturity Model Integration and the Baldrige criteria can all help improve organizational process effectiveness.

Some organizations see process improvement as the silver bullet that will solve all internal and external problems, reduce cost, decrease cycle time and improve the bottom line. Process improvement methods can accomplish these challenges if implemented properly, but they can have the opposite effect if executed poorly.

To avoid the frustration and wasted time and money spent on efforts that go nowhere, there are nine steps an organization must follow to implement process improvement projects and make change last over the long haul. While the need for effective and engaged leadership is not emphasized specifically, it is nonetheless an essential ingredient running through these steps:

1. Understand and plan for level of maturity.
2. Link process improvement to strategic plan and establish criteria for success.
3. Allocate appropriate resources.
4. Train employees and change the culture.
5. Implement the plan reasonably.
6. Coordinate efforts throughout the organization.
7. Publicize results.
8. Provide rewards and tie results to bonuses and promotions.
9. Be patient. Have a long-term view.

A division of the National Reconnaissance Office (NRO) followed these nine steps, allowing it to build a mature process improvement strategy and make it a part of its culture. This is the story of its process improvement journey.

In search of efficiency

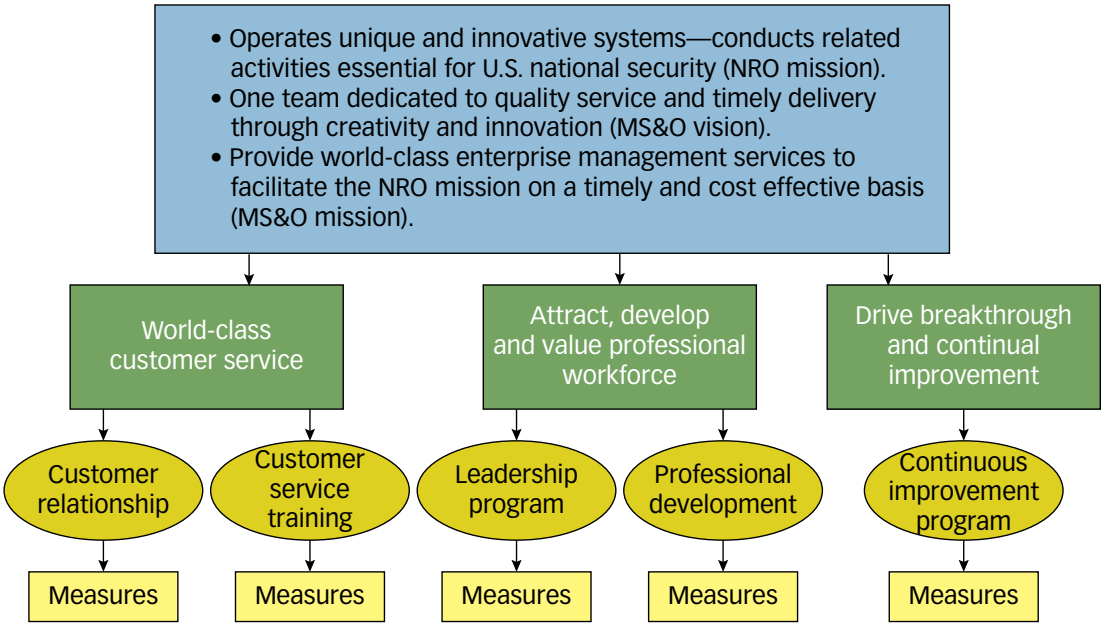
NRO, located in Chantilly, VA, designs, builds and operates U.S. reconnaissance satellites. There's an organization within NRO called management services and operations (MS&O), which provides support for the entire NRO. This includes tasks such as facility management (for example, space management, custodial care and building maintenance), travel claims, media services, logistics and IT support.

Several years ago, MS&O's leadership recognized certain practices needed to improve service to NRO customers. At an off-site meeting during the summer of 2004, MS&O leadership decided to adopt the Baldrige criteria as the overall management method for MS&O.

One of MS&O's new group chiefs, a trained Black Belt (BB), also suggested using Six Sigma as the process improvement method. The leadership team agreed and laid out a plan to provide resources, training, tracking and rewards for process improvement.

The plan coincided with the nine steps listed earlier. Specifics on NRO's process improvement implementation are provided to describe some of the obstacles that needed to be conquered in each of the steps.

MS&O strategic plan / FIGURE 1



MS&O = management services and operations
NRO = National Reconnaissance Office

Process improvement should be approached with a **long-term view,** including **strong leadership** support and **resource allocation.**

1. Understand and plan based on the level of maturity. Too often, organizations decide to jump into process improvement without assessing current levels of understanding and the collective level of maturity in relation to process improvement. Support and recognition of the need for change from senior and mid-level managers are critical before beginning a process improvement initiative. Without that support, resources will not be provided, roadblocks will be established, and well-intentioned efforts will fail.

In *Leading Change*, John P. Kotter discusses the need for management to acknowledge that change is needed and management's willingness to take on change.

> "No one individual, even a monarch-like CEO, is ever able to develop the right vision, communicate it to large numbers of people, eliminate all the key obstacles, generate short-term wins, lead and manage dozens of change projects and anchor new approaches deep in the organization's culture. Weak committees are even worse. A strong guiding coalition is always needed—one with the right composition, level of trust, and shared objective. Building such a team is always an essential part of the early stages of an effort to restructure, reengineer, or retool a set of strategies."[1]

The MS&O team realized its employees and management did not have a mature process improvement culture. The leadership recognized, however, the need for change and established a senior coalition to implement process improvement at the level it felt would be accepted and used. The coalition determined that training and implementation of process improvement should not be complicated. To be successful, process improvement needed to be accomplished at a basic level of understanding, at least in the early stages of the effort.

2. Link process improvement to the strategic plan and establish criteria for success. Any successful process improvement implementation must be linked to the organization's strategic plan. Strategic plans state organizational direction in a mission and vision statement with associated goals and objectives, which are then measured. This formal structure links all activities toward achieving the overall vision of the organization.

The MS&O strategic plan, shown in Figure 1, links its process improvement efforts directly to its mission. Note the third goal in the strategic plan to "drive breakthrough and continual improvement" is supported by the objective of "set up a continuous improvement program."

To ensure this goal was being met, the MS&O established metrics to track the percentage of employees that have been trained, the number of projects completed and the results of those projects. These metrics were tracked monthly, and additional courses were established as needed to meet these goals.

3. Allocate appropriate resources. Process improvement efforts require resources in training, manpower and support. Phillip Crosby discussed resources needed to implement a quality program in *Quality is Free.*[2] He pointed out that the savings from quality are larger than the expense of resources applied to ensure a quality process.

As in any operation, project or endeavor, if appropriate human and monetary resources are not applied, failure is certain. Many organizations recognize the need to improve and can see the benefits, but they are unwilling to allocate the needed resources to make it happen. Then they wonder why they fail.

Process improvement teams often have great ideas and enthusiasm, but because of the daily requirements of their jobs, some individuals have been unable to participate fully. If they had just recognized the reality that improvement was an integral part of their jobs, participation wouldn't have been a question.

MS&O started its process improvement initiative by hiring a full-time BB to oversee the program. MS&O hired the author as a contractor to teach its Six Sigma course and required supervisors to allow team members to meet on a regular basis and complete team

responsibilities on company time. Additional resources and support were identified up front in a team charter provided by management.

4. Train employees and change the culture. To implement a successful transformation and process improvement, employees must shift the way they think and work. Training is the critical initial step needed to initiate cultural change. Often, organizations try to implement process improvement by training only a few employees. Permanent shifts in organizational culture must involve all employees, and each employee must have at least a basic knowledge of what is expected and how the change will be accomplished.

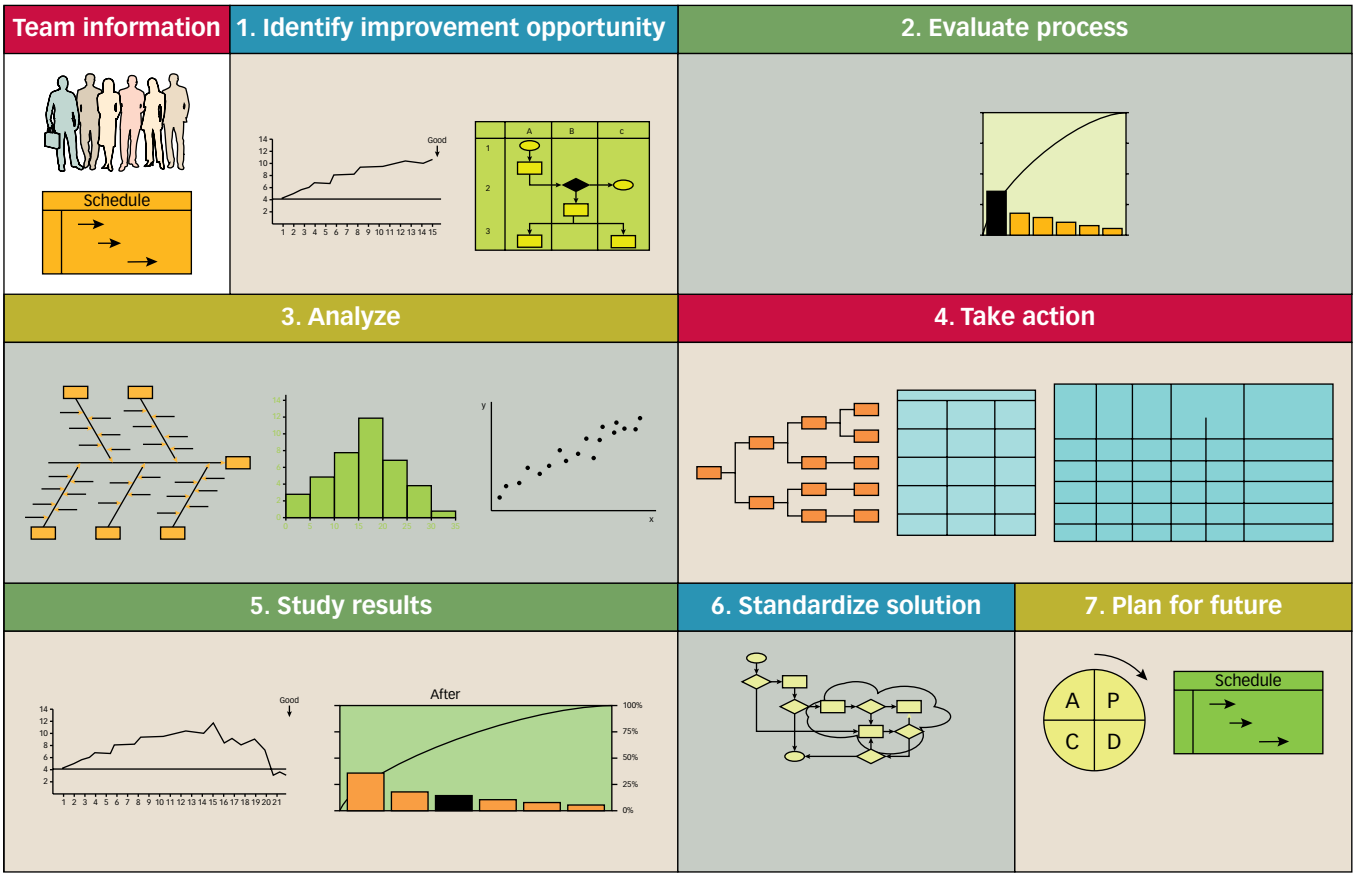
MS&O planned to train a majority of its employees over a two-year period and set up a training program to accomplish this goal. MS&O started with a course based on the Six Sigma method being taught by one of its sister organizations and adapted the course to meet its needs.

Initially, two-day classes were scheduled every other month in which 20 to 30 students attended the training. Students were assigned projects prior to attending the course so tools and training were directly applied. Each team left the course with a team charter, which included a problem and opportunity statement, a goal, a roster of team members (including a champion) and a high-level project management plan with milestones.

Over time, the course was revised and expanded to three days to include lean tools and methods. Currently, quarterly classes train new employees and include those not previously trained.

5. Implement the plan reasonably. When implementing a process improvement method, don't expect results before the program can be fully established. Process improvement takes time and usually does not occur in one month. Once the team is trained and a project is defined, Six Sigma projects normally take between four to six months to complete.

MS&O story board / FIGURE 2



MS&O = management services and operations

When the U.S. Army implemented its lean Six Sigma (LSS) program in 2006, for example, it issued a formal deployment plan which included training requirements and spelled out the project's completion—with hard results—would be implemented within six months to meet fiscal requirements. Unfortunately, the startup and training required could not be completed within the six-month time frame, which forced delays of the overall program.

In *Lean Six Sigma for Service*, Michael L. George highlighted the successful implementation of process improvement in Fort Wayne, IN. George wrote that public sector organizations should expect a long learning curve.

"Besides training the [Six Sigma] Black Belts, almost nothing else happened the entire first year except a lot of communication … Once the first few waves of training were completed, awareness and understanding proliferated much faster."[3]

MS&O did not expect immediate results. It provided training, established a schedule for completion of projects, facilitated project teams and continued to teach and provide assistance. MS&O monitored projected schedules and made adjustments as needed. To date, MS&O has completed 17 projects and has 11 ongoing projects affecting all areas of its operations. Some team members have been working on multiple projects, assisting others and furthering the culture change required to truly improve the organization.

6. Coordinate effort throughout the organization. Organizations often fail to do a good job of coordinating process improvement efforts across and within the organization. One section of the organization may have an interest in or decide to implement an improvement effort locally without any communication with leadership. This results in suboptimization of process improvement.

This was the case with the U.S. Army before it officially rolled out its LSS deployment plan in 2006. Letterkenny Army Depot, located in south central Pennsylvania, became enthusiastic about process improvement in 2004 and did an exemplary job of improving its individual processes using lean principles. In fact, the depot was awarded the Shingo Prize in 2005 for its Patriot launcher rebuild program and the Silver Shingo Prize in 2006 for its tactical-wheeled vehicle Humvee recapitalization program.[4, 5]

Other depots and similar units across the greater Army organization, however, did not benefit from these improvements. At the time, the Army did not have a systemwide implementation plan.

Because of its management and oversight, MS&O leadership identifies improvement projects it determines are of the most value to the organization and that can relate to other projects, either ongoing or completed. For example, there have been times when two or three related process improvement projects have been selected, and team members were assigned to attend the LSS class in which all related issues were addressed throughout three days of training. MS&O leadership also makes an effort to include every organization under its umbrella to ensure all employees receive training and the entire organization focuses on continual improvement as part of its culture.

7. Publicize results. Everyone likes to be in the spotlight and talk about success stories. Employees are pleased to see their names in print, especially when they are associated with accomplishments that can bolster individual images and the overall corporate image.

As success stories are told, there is a natural tendency for others to jump on the bandwagon and get involved. In addition, change management is easier to implement and the entire organization is positively affected. An added bonus of publicizing results is the increased likelihood to receive additional funds and resources to continue to improve the organization.

When the author led a process improvement project with an Air Force squadron, the 325-member squadron applied for the Air Force recognition program based on the Baldrige criteria. After the squadron won at the command level (Europe) and as personnel prepared for the Air Force-wide competition, senior leaders were remarkably willing to approve requests to purchase equipment and supplies to improve facilities and overall operations for the on-site visit.

MS&O has been exemplary in publicizing its results within the entire NRO. In May 2006, MS&O highlighted six successful improvement projects and published them consecutively in its monthly publication. One team in media services was able to improve on-time delivery of projects from 85 to 98%. This team was also recognized as a finalist in the ASQ International Team Excellence Award competition in 2006. Another team was able to reduce the time it takes to get travel reimbursements by more than 50%.

When other sister organizations expressed interest,

they were invited to attend the three-day course and see firsthand how the program worked.

Story boards, posted on the local network, have been used for each project and helped report the successes of each completed project and its results. The storyboard shown in Figure 2 (p. 26) is a template used by MS&O to track and report the success of each process improvement team.

8. Provide rewards—tie to bonuses/promotions. Long-term implementation of a process improvement method requires support and involvement from everyone in an organization. Key to making this happen is rewarding those who are involved and implementing improvement projects.

Most employees require motivation to think about the processes for which they are responsible and to change the way they do business. This can be in the form of team awards, spot bonuses and annual raises or bonuses tied directly to performance evaluation.

When Bank of America implemented its Six Sigma program, for example, every senior executive was required to attend Green Belt (GB) training and conduct a GB project. Bank of America now has hundreds of senior leadership positions that require Six Sigma training as a prerequisite.[6]

Under Jack Welch's leadership, General Electric (GE) changed its incentive compensation for the entire company so 40% of bonuses were based on Six Sigma results. Like Bank of America, GE senior management positions are filled based on Six Sigma skills, passion and results.[7]

MS&O has incorporated these ideas into its management and reward system. Each manager has process improvement as a standard in performance evaluations.

9. Be patient—have a long-term view. It takes time for process improvement to achieve regular and consistent returns. It does not happen overnight. Organizational culture must change and provide essential training, guidance and follow-up. Leadership support must not waiver or improvement efforts will fail, particularly if organizations are unwilling to take a long-term view.

Total quality management and quality circles were two methods that came and went without the commitment to see it through. Even when huge investments in training and leadership support exist, the enduring commitment must be kept in mind. Welch, who invested hundreds of millions of dollars in Six Sigma at GE, admitted, "We were three years into Six Sigma before we 'got it.'"[8]

Transformation is difficult, and it takes time to make a significant cultural shift. There will be lapses, backtracking and many successes, but expect complete implementation of any process improvement method to take years.

MS&O started with a long-term view. Its strategic plan for implementing the Baldrige criteria and process improvement was based on five to 10 years of deployment. MS&O leadership committed to shifting its culture over an extended period of time, recognizing that permanent transformation takes strategic commitment.

After two years, there is evidence the MS&O culture is embracing continuous improvement. Employees question the status quo, and customer satisfaction is consistently improving. With continued dedication to the long-term view, MS&O will accomplish its goals.

Sky's the limit

Process improvement is important to the profitability and success of any organization. It should be approached with the long-term view, including strong leadership support and guidance with proper resource allocation. When successes are achieved, tell the story to all who will listen so others will accept and implement the cultural change.

If these steps are followed, your organizational culture can change permanently, and process improvement will become a way of doing business, not just a popular passing notion. QP

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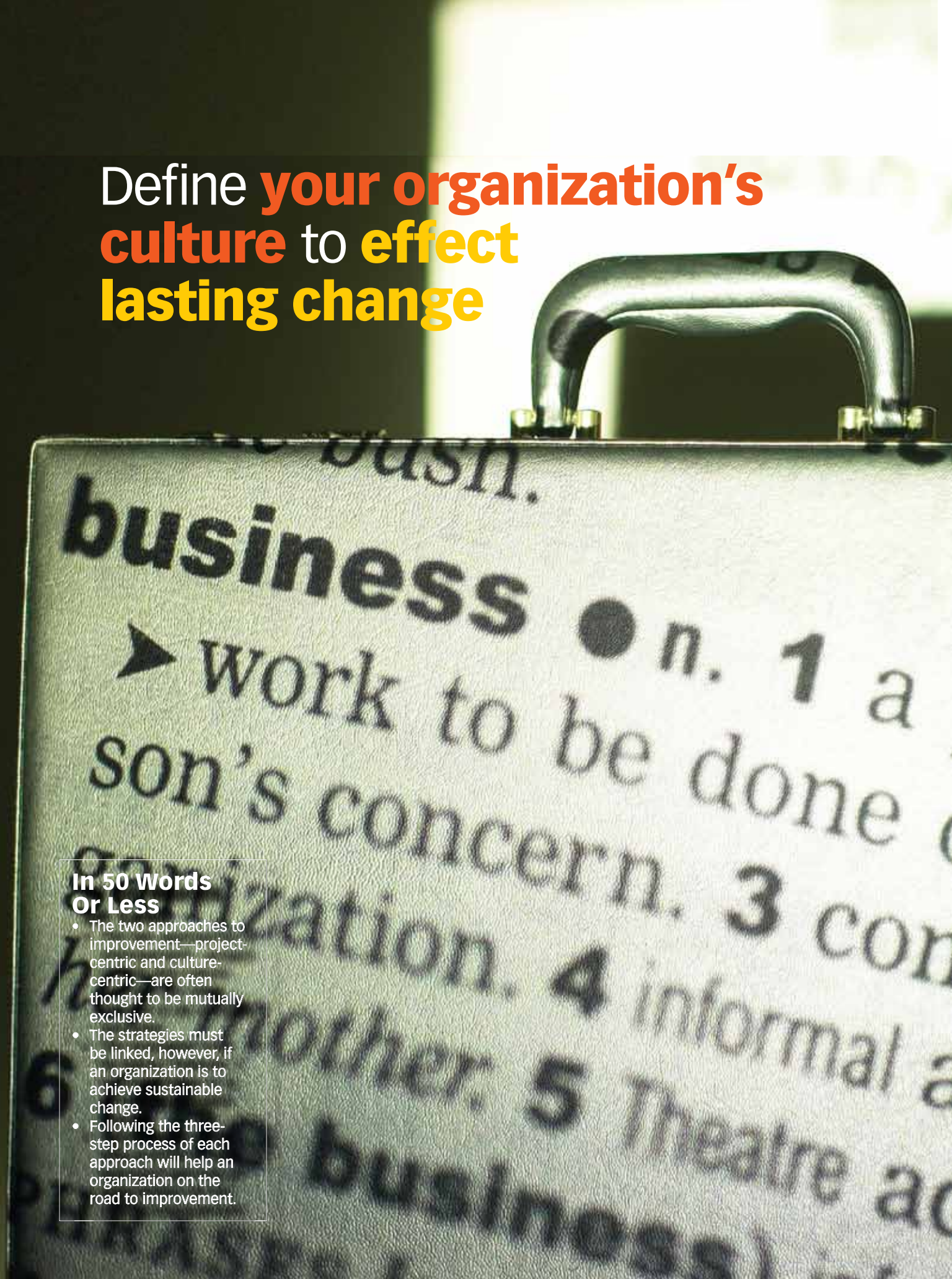
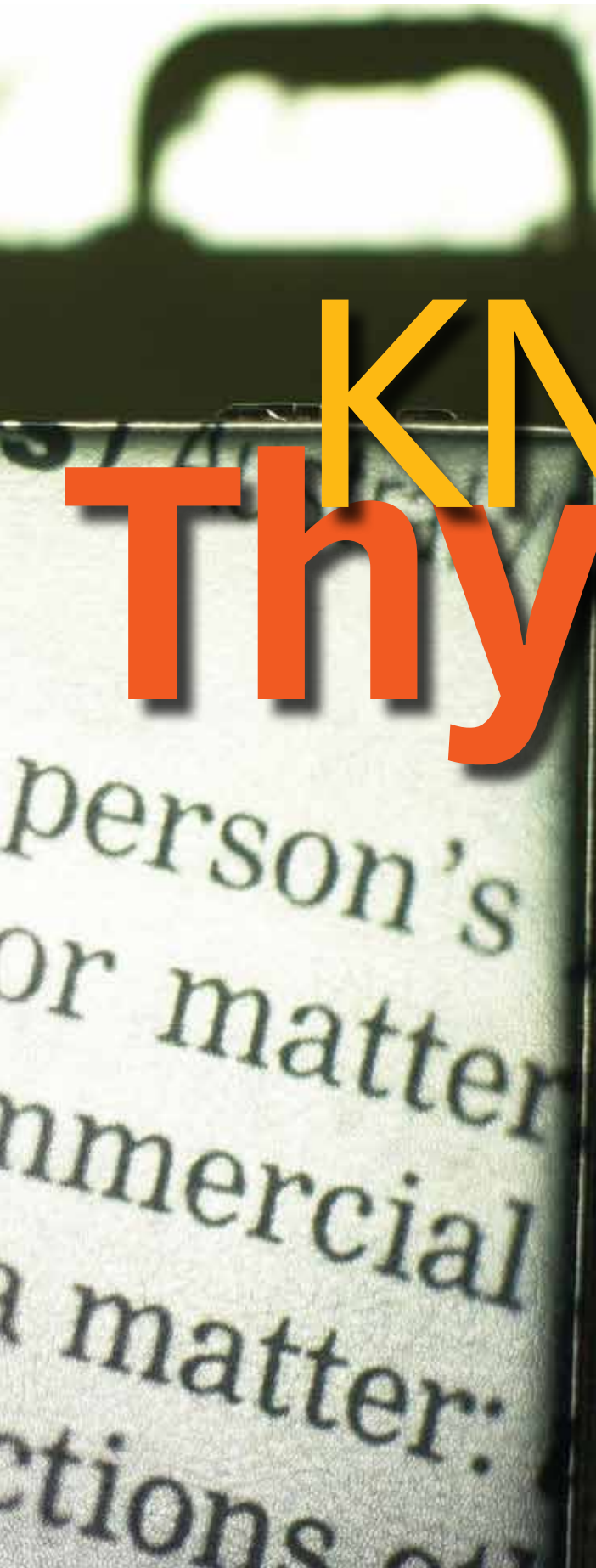
Define your organization's culture to effect lasting change



In 50 Words Or Less

- The two approaches to improvement—project-centric and culture-centric—are often thought to be mutually exclusive.
- The strategies must be linked, however, if an organization is to achieve sustainable change.
- Following the three-step process of each approach will help an organization on the road to improvement.



by Robert P. Warda

KNOW Thyself

THE PHILOSOPHER Aristotle said: "Excellence is an art won by training and habituation. We do not act rightly because we have virtue or excellence, but we rather have those because we have acted rightly. We are what we repeatedly do. Excellence, then, is not an act but a habit."[1]

When thinking about approaches to improvement, it seems there are two schools of thought. The first—project-centric improvement (PCI)—is specific and targeted in application because of its focus on project activities. The second school of thought—culture-centric improvement (CCI)—is more comprehensive and is process or system-focused. CCI deals with how an organization gets things done, which is directly influenced by the organization's culture.

As shown in Figure 1, PCI has three principal stages:

1. **Minimum performance level**. For example, compliance projects rooted in regulatory or legal requirements demand immediate attention and resources. They establish the minimum for operational performance.
2. **Low-hanging fruit**. An organization's initial step in process improvement, in which the major focus is to drive out waste and other nonvalue-added activities.
3. **Cycles of refinement**. An organization addresses operational variation and has mastered the ability to learn and apply that newfound knowledge.

Traditional thought says the approach or method you select depends on the problem or issue you are trying to address and that both of these approaches have their separate places. But PCI and CCI are inextricably linked. One cannot exist without the other if you want to achieve your objective of long-term, sustained quality.

To ensure both receive attention and resources and are truly recognized as two sides of the same coin, the question is not which to choose to address, but when to address them. In the United States, we tend to jump straight into PCI. There often is a reluctance to confront culture directly, either because it is perceived to be too big of a mountain to climb, or there is a belief there is no need. The compliance-based targets in the early stages of PCI also seem to present a shorter, more manageable path to progress. For PCI to be effective and sustainable, CCI must come first.

Cautionary tale

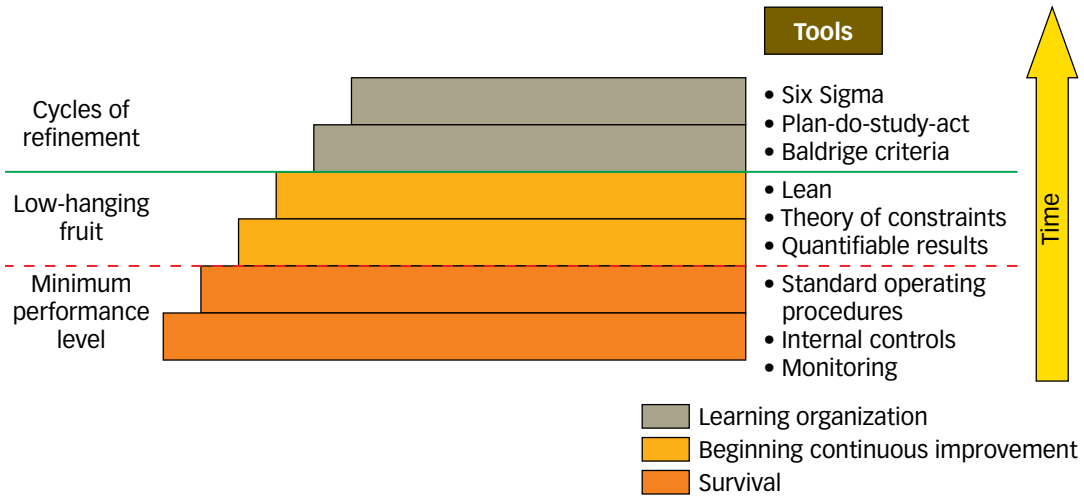
In *Quality Improvement—A Systems Perspective*, William Roth outlines how businesses have addressed the need to improve by taking the first step of thinking of the issues as technical problems. Organizations were obsessed with the concept of zero defects and driving out all inefficiencies.

"The employees involved—the 'socio' part of sociotechnical systems, according to the engineering school of thought—were secondary," Roth explains. "Technology was primary. Employees serve the machines, the processes. Get the technology right, the employees would fall into place, and quality would improve."[2]

Consider how the U.S. automotive industry, once a source of national pride and power, became complacent and fell into disarray and crisis. Quality and labor problems—combined with new overseas competition—have nearly destroyed General Motors, Ford, and Chrysler. The Big Three's share of the American market dropped from 84% to 69% in the 1980s, and about 600,000 jobs were lost.[3]

The response was a renewed focus on quality. Millions of dollars were spent to educate staff on process-improvement tools used by Japanese automakers. Organizations went into an immediate mode of data collection to determine where they were hemorrhaging the most. Teams of engineers and consultants were dispatched to fix the problems systematically, moving from one problem to the next with surgeon-like precision.

Project-centric improvement model / FIGURE 1



As the number of interventions increased, improvement was realized and, in some instances, sustained. But in many others, it was not, requiring additional improvement activities to recapture ground already gained and lost again.

The reason many organizations do not achieve long-term sustainable progress is not a result of a lack of hard work, dedication or resources. On the contrary, most of the people involved with improvement activities have put in countless hours and effort to make them work.

More likely, the problem was that PCI came before or independent of CCI. CCI is often the elephant in the room that no one wants to bring up. It's easy to rally everyone around the quality flag, but it's difficult to face the fact that the organization as a whole, including its leadership, does not always walk the talk.

A step in the right direction

The Roman philosopher Seneca once said, "If a man knows not what harbor he seeks, any wind is the right wind."[4] Only by knowing where you are going and what you want to be will your organization achieve its potential. Often, organizational direction is well known within leadership but not across all levels.

The most effective organizations have clearly defined cultures that are well known to everyone and are a living presence in every aspect of the operation. In his book, *Corporate Culture and Organizational Effectiveness*, Daniel Denison has shown that cultural norms impair performance.[5] He emphasizes the importance of having leadership modify the basic norms of an organization as a prerequisite for quality performance.

Other authors have stated that quality improvement generally has experienced only modest success because organizations fail to address culture.[6, 7] Defining an organizational culture, however, sounds much simpler than it really is.

Just as PCI advances in three stages based on survival, low-hanging fruit and cycles of refinement, CCI can be divided into three clear steps. The key is to take them one at a time.

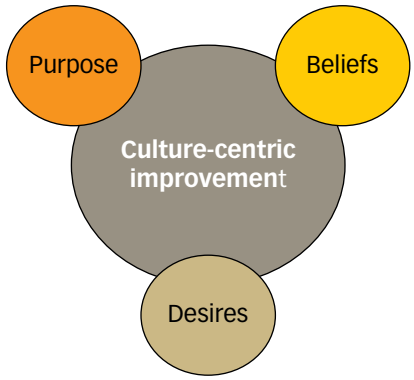
Step one: decide who you are

Volumes of material have already been published about mission and vision statements. For the purposes of brevity, the myriad books, articles, classes and consultants' programs can be boiled down to the answers to three simple questions:

1. Mission: Who are we, or what is our purpose?
2. Values: What do we believe in?
3. Vision: Where do we desire to be?

A fundamental responsibility of top leadership is to answer these three questions clearly, concisely and without any ambiguity. Those answers all contribute to culture-centric improvement (see Figure 2).

Culture-centric inputs / FIGURE 2

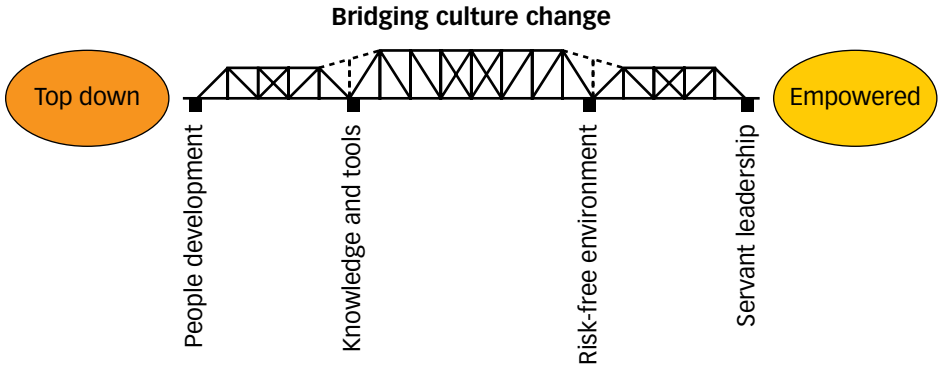


Let's explore the first question. The answer clearly establishes the purpose of the organization. It also provides the roadmap for reaching the answer to question three; in other words, it helps fill in details about how we will get there.

Herman Miller Inc., a world leader in the manufacture and sales of office furniture, has long been recognized not only for innovative designs and quality products, but also its strong commitment to employee participation and a fundamental belief in dignity and respect for everyone in the organization. The company answered the first question in this fashion: "We study work and living environments and design and deliver products and services that make these environments work better."[8] This is the company's purpose, its reason for existence.

To address the second question, come face to face with the issue of values. What makes this a bit of a slippery slope is that values are like opinions. Everyone has them, and they often differ. For an organization to establish its culture, it must first have a universally agreed to and committed set of values without hidden agendas or special circumstances.

Characteristics of empowered organizations / FIGURE 3



One such organization is Mayo Clinic, based in Rochester, MN. One of the world's most respected and renowned medical institutions, this healthcare provider espouses one simple value: The needs of the patient come first. This value was first put forth decades ago by one of its founding fathers, William J. Mayo, who said, "The best interest of the patient is the only interest to be considered."[9] This single statement is infused into every aspect of this institution and serves as the very fabric of its being.

So, what do you believe in? What expectations will there be for how the people and the organization interact? Are these values readily perceived internally and externally? The answers cannot be a flavor of the month, nor can they be abstract. Values should be timeless and crystal clear. They become as much a condition of employment as confidentiality, safety or any other expectation.

Truly sustainable quality can be achieved only when it is a fundamental part of your organization's values, not just a series of projects. Brian Zmolek, director of quality at Winona Health in Winona, MN, and a senior examiner for the Malcolm Baldrige National Quality Award, often says, "Quality has to be in your organization's DNA." Quality is not what you do; it must be who you are.

The final question establishes the organization's compass and allows you to remain focused on the goal at all times. You may never reach the goal, but you will continue to try. Whereas question one prompts you to state your organization's purpose and question two your organization's beliefs, question three leads you to profess hopes and desires for the organization.

For example, fast-food giant McDonald's vision states, "McDonald's vision is to be the world's best quick-service restaurant experience. Being the best means providing outstanding quality, service, cleanliness and value, so that we make every customer in every restaurant smile."[10]

Step two: walk the talk

Sustained permanent change can only happen in the trenches, at the point at which your organization creates or adds value. Process improvement cannot occur unless it is enabled, and that requires leadership commitment in an environment of innovation.

Commitment means more than lip service; it means walking the talk at every encounter and interaction. Looking for those instances when a leader bends on a certain issue and interpreting those instances as gray areas can be tempting. But when it comes to affirming an environment of innovation, these areas are tests of the leader's commitment. Taking a black-or-white stance is the only option if you truly want to enable the culture that will take root. It is incumbent on leadership to set the tone and create an environment that is consistent with the purpose, beliefs and vision of the organization.

Creating an environment of innovation requires the organization to become comfortable with change. Without this, improvement is very difficult to effect, and the results are often unsustainable.

Step three: empowerment

Max DePree, former chairman of the board of Herman Miller Inc., once said, "Leaders need to foster environ-

There must be an environment in which failure **is a learning opportunity,** not an **opportunity for punishment.**

ments and work processes within which people can develop high-quality relationships—relationships with each other, relationships with the group with which we work, relationships with our clients and customers … We cannot become what we need to be by remaining what we are."[11]

An organization cannot achieve its full potential simply through leadership mandates. This kind of achievement happens only when people, culture and processes come together with the right tools and technology to create a dynamic and engaged learning organization. Empowerment is the enabler that drives employee engagement, and engagement is required if employees are to feel a deep sense of ownership in their organization and the roles they play in it.

Empowered organizations share many of the same characteristics. The four most important are shown in Figure 3 and are all necessary for an organization to move from a top-down management approach to being truly empowered. They are:

1. People development: This activity is comprehensive, constant and spans every aspect of the organization. Without question, Toyota and quality are viewed as one and the same. When organizations institute lean Six Sigma, I often hear people within the organization say they are implementing a "Toyota-like" system. Nothing could be further from the truth.

Toyota has not achieved success because of implementing and mastering these tools; its success is due to it being, at its core, a learning organization. It has created, as an integral part of its culture, an organization that is adept at seeing and solving problems. It is obsessed with failure and constantly looking for ways to avoid it.

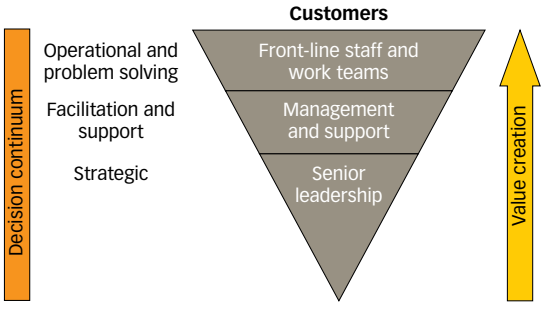
To get to this point, it was first and foremost committed to employee development. John Kanagy, a practicing physician who spent two years working with Toyota as a visiting scholar from the Harvard Business School, said as much in an interview with the *UC Health Care Digest*: "Toyota is very good at making cars, but their greatest expertise is in accessing, developing and directing the knowledge, creativity and problem-solving ability of their people. They are really a people-development company that happens to make cars."[12]

2. Knowledge and tools: Fundamental to a learning organization is knowing what knowledge and tools are needed to accomplish a task. Toyota has used tools such as lean and Six Sigma, which may not be the tools you need. Empowered organizations stay focused on several important lessons about tools and their applications.

No one tool solves all organizational issues. As the American psychologist Abraham Maslow said, "If you only have a hammer, you tend to see every problem as a nail."[13] Tools are effective only if used in the right application the right way at the right time. Some issues require multiple tools.

3. Risk-free environment: For employees to seek opportunities for improvement and effect change, there must be an environment in which failure is a learning opportunity, not an opportunity for punishment. With any change, there is the possibility of failure. Learning organizations acknowledge and accept this, looking for reasons why the unexpected result occurred, addressing them and moving forward.

Organization chart as inverted pyramid / FIGURE 4



Culture-centric vs. project-centric improvement / TABLE 1

	Culture-centric improvement	Project-centric improvement
Effect	Organizationwide	Specific target
Focus	Process	Project specific
Elements	• Purpose • Beliefs • Desires	• Minimum performance level • Low-hanging fruit • Cycles of refinement

When asked about failure, Thomas A. Edison once said, "I am not discouraged, because every wrong attempt discarded is another step forward."[14] This is a key condition for long-term, sustained improvement. Realizing that risk-free doesn't mean a lack of accountability is also crucial. There is no shortage of accountability in a learning organization; accountability just manifests itself in different forms. The focus becomes more about the process and what was learned from the experience to achieve a better result the next time.

4. Servant leadership: In *Leadership Is an Art*, Max DePree states, "The first responsibility of a leader is to define reality. The last is to say thank you. In between, the leader is a servant."[15]

Herman Miller's organization chart (see Figure 4, p. 35) appears as an inverted pyramid, with the widest part—the area in the organization in which value is created—being closest to the customer. The area of the pyramid between the base and the top point is where the resources exist to enable and support the activity at the base. Management resides in this space, and its focus becomes less directive and more enabling.

Successful managers and leaders in this environment are adept at coaching, development and facilitation. Their goal is to create an environment in which others can achieve their potential and objectives—at the place where value is created. The Japanese call this place *gemba*.

Sightline to sustained results

The philosopher Friedrich Nietzsche said, "He who would learn to fly one day must first learn to stand and walk and run and climb and dance; one cannot fly into flying."[16] That is sound advice, whether in the natural world or an organization. The key is to start by going back to the beginning—back to square one to create a dynamic, engaged learning culture firmly rooted in your values and what you are as an organization.

To accomplish this, CCI is the right first step, followed by PCI (Table 1) in a journey with no finish line. Creating the environment necessary to support permanent change will lead to long-term sustained progress and results. The critical element is making sure all employees in the organization are aware of overall progress and how they contribute every day—in other words, how they create value. I call this a line of sight model, in which all employees know how they participate in the cumulative value equation and how they make a difference. QP

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Keeping SCORE

Use **rubrics** to advance **continuous improvement** in schools

In 50 Words Or Less

- Quality rubrics can provide clear direction to employees, supervisors, coaches and staff developers in the education sector.
- The tool allows the collection of data that point to the gradual deployment of a continuous improvement culture in classrooms, schools and districts.
- Rubrics can guide professional development.

by Steve Benjamin

LIKE MOST OF YOU, I've seen the "latest, greatest thing" introduced in organizations—repeatedly.

We observe initial excitement for the new strategy among a few leaders, bursts of training for the employees, spotty implementation and eventual abandonment of the new approach. Then the cycle begins anew.

The following criticism is intended for the business world, but it is also true for school districts:

Good, important ideas get launched with much fanfare, but six months or a year later they're dead in the water and are abandoned as unworkable. Why? Down in the organization, the managers (ead classroom teachers, building principals, directors) feel that the last thing they need is one more time-consuming project of uncertain merit and outcome, so they blow it off … Result: the company wastes time, money and energy, and the leader loses credibility.

Only about 15% of companies compare performance with plan to determine whether strategy is working.[2] The actions that management can take to improve the chance that strategies will be implemented include using language everyone understands, turning expectations into detailed performance contracts, monitoring performance regularly, and rewarding and enhancing system deployment.

If one of your key strategies for improving performance is to transform into a quality organization, a deployment rubric can help you chart an unambiguous path toward that elusive continuous improvement culture you want to create.

Quality, continuous quality improvement, continuous improvement and other terms describe a general philosophy and an ever-expanding set of tools and processes many organizations have adopted in an effort to generate improved performance.

In education organizations, much investment in training has been provided to help classroom teachers, support staff and administrators "do" quality.[3] Yet, following training, a common refrain is, "Can you tell me what it is exactly you want me to do with this knowledge?"

Often, teachers are among the most vocal in their pleas for a target they can hit. But leaders are often at a loss as to what the exact vision is. What will a fully deployed continuous improvement culture look like? Will I know it if and when I see it?

A quality rubric can be used to provide clear direction to employees, supervisors, coaches and staff developers, while allowing the collection of data that point to the gradual deployment of a continuous improvement culture in classrooms, schools and districts.

Rubric: what and how?

A rubric is a scoring tool that lays out specific performance expectations. Rubrics divide an assignment into its component parts and provide a detailed description of what constitutes acceptable or unacceptable levels of performance for each of those parts. The use of rubrics in the business world has been described as a layered process audit (LPA) that requires a critical to quality checksheet.[4, 5]

An LPA is simply a disciplined method of verifying that processes and strategies are implemented in the intended manner. Education organizations can accomplish the same goal by using a quality rubric.

Rubrics can help set clear expectations for implementation of quality learning that administrators, teachers and support staff have gained during professional development activities. A rubric (see Table 1) can guide professional development while providing a measurement tool to gauge progress through various stages of growth.

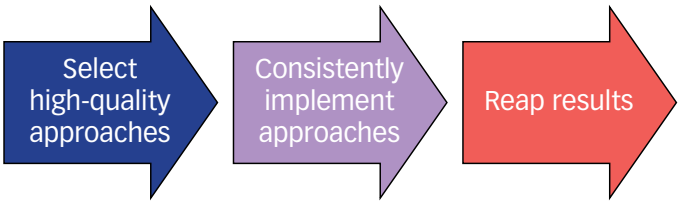
Speaking about the failures of whole-school reform and feckless staff development, one author charges that "the failure of this expensive and elaborate apparatus [is] all but guaranteed by the absence of follow-up support or of any meaningful attempts to monitor implementation."[6]

Improved organizational performance results can occur only after good approaches have been selected and faithfully implemented (see Figure 1). Yet education organizations that actually expect employees to fully implement improvement are like ivory-billed woodpeckers—we thought there were none, but occasionally someone reports a sighting.

When good quality learning is combined with clear expectations, quality professional development, a method of tracking deployment and appropriate recognition, real improvement can be achieved.

Link staff development and follow-up supervision with your quality rubric, and implementation of

Natural flow toward improved results / FIGURE 1



Sample quality rubric / TABLE 1

Mad River Local Schools Baldrige Award classroom quality rubric checklist	
Accomplish each task in a level. Seek certification by one of your Baldrige trainers. Move on to the next level and repeat.	
Quality level 1	
√	Completed teacher customer/stakeholder matrix at the teacher level.
√	Facilitated student-generated classroom and personal mission statement (grades K-2, teacher and classroom only; grades 3-12, teacher, classroom and student).
√	Established and displayed your dashboard reflecting end-of-the-course student achievement goals.
√	Created student data folders aligned with your dashboard.
	Developed classroom displays of data for above.
Quality level 2	
	Completed all components of level 1.
	Completed teacher customer/stakeholder matrix at the teacher and classroom levels.
	Maintained and continually updated your dashboard reflecting end-of-the-course student achievement goals.
	Student data folders are maintained, continually updated and aligned with your dashboard.
	Developed teacher data folder with classroom dashboard data.
	Conducted quarterly system-to-system (S2S) meetings with the principal (team, grade level, department or individual).
	Demonstrated use of two quality tools for classroom improvement.
	Conducted quarterly celebrations of performance achievement and progress.
	Demonstrated use of one ongoing plan-do-study-act (PDSA) cycle aligned to the dashboard.
Quality level 3	
	Completed all components of levels 1 and 2.
	Completed teacher customer/stakeholder matrix at the teacher, classroom and student levels.
	Conducted two S2S meetings with students (one per semester).
	Demonstrated use of three quality tools for classroom improvement.
	Conducted student-led conferences.
	Participated in at least one benchmarking visit or best practice identification team.
	Completed publication documenting continuous improvement project that delivered improved student learning or process improvement with supporting data that will be shared with stakeholders.
	Conducted quarterly celebrations of performance achievement/progress.
	Demonstrated use of two ongoing PDSAs aligned to the dashboard.
Quality level 4	
	Completed all components of levels 1, 2 and 3.
	Conducted quarterly S2S meetings with students.
	Demonstrated use of five quality tools for classroom improvement.
	Participated in at least two benchmarking visits or best practice identification teams.
	Completed two publications documenting continuous improvement projects that delivered improved student learning or process improvements with supporting data that will be shared with stakeholders.
	Demonstrated use of three ongoing PDSAs aligned to the dashboard.
Training for all components is available on each building's shared drive in a folder called "Classroom quality rubric—how to" (adapted from Steve Benjamin, *The Quality Rubric,* ASQ Quality Press, 2007).	

quality tools, values and principles will happen quickly (see Tables 2-4 and Figure 2, p. 44).

Quality organizations track the degree of strategy deployment to ensure full implementation of their most important approaches. An unambiguous quality rubric will specify key elements of each person's work, and when daily activities are aligned with strategy, results can't be far behind.

If your vision is to develop a continuous improvement culture in your district or school, then "execution has to be embedded in the reward systems and in the norms of behavior that everyone practices ... focusing on execution is not only an essential part of a business's culture, it is the one sure way to create meaningful cultural change."[7]

Without clear alignment of core values, goals, professional development, supervision, and rewards and recognition, your new quality approach "will be put on the shelf along with all those other initiatives, gathering dust communally."[8]

Jay Marino, assistant superintendent of Cedar Rapids Public Schools in Iowa, says, "Our school district has embraced the quality levels and has implemented them in K-12 throughout the district. The quality levels serve as our 'standards and benchmarks' for quality and continuous improvement in the classroom."[9]

Paul Hillyer, superintendent of Columbus Public Schools in Nebraska, says he believes development of a local quality rubric "brings much needed clarity and direction to improvement initiatives. It also serves as an excellent means to monitor progress."

Baseline data for four-level rubric / TABLE 2

Danville, IN, quality classroom rubric levels by number (percentage) of staff for 2006-2007					
	0	1	2	3	4
North elementary school	2 (7%)	22 (76%)	4 (14%)	3 (10%)	0 (0%)
South elementary school	0 (0%)	5 (19%)	8 (31%)	12 (46%)	1 (2%)
Middle school	0 (0%)	18 (82%)	4 (18%)	0 (0%)	0 (0%)
High school	0 (0%)	32 (73%)	9 (20%)	2 (5%)	1 (4%)

Danville growth in PDCI cycle implementation / TABLE 3

January 2007 data in red; January 2008 data in blue Do you feel able to use the PDCI cycle to improve learning in your classroom?	High school		Middle school		South elementary		North elementary		Total	
Yes	33	34	19	21	26	29	31	28	109	112
No	8	3	0	0	3	1	2	2	13	6
How many PDCIs have you done this school year?										
I haven't yet	2	0	0	0	0	0	2	0	4	0
1-2	17	12	5	0	5	8	14	7	41	27
3-5	14	17	9	8	16	8	6	7	45	40
6-10	4	4	3	8	5	7	7	10	19	29
11+	4	8	2	5	3	7	4	6	13	26
Are you using the data from your PDCI cycle to make improvements in your classroom?										
Not yet	4	3	0	0	1	0	3	2	8	5
Sometimes	18	14	10	4	11	10	17	7	56	35
Usually	17	18	7	16	12	15	10	15	46	64
Always	1	6	2	1	5	4	3	6	11	17
Yes, we are conducting more PDCIs in our classrooms, and *yes, we are using the data for improvement!*										

PDCI = plan-do-check-improve

What about results?

The quality rubric is a new tool in many districts, and often only baseline or first-year data are available. Nevertheless, such information provides a starting point for goal setting and recognition.

Mary Ann Plahitko, director of quality for Danville Community Schools in Indiana, provided baseline data for her district. Table 2 indicates initial results across four levels of quality. For example, at the end of the first year of deployment, nearly half (46%) of the faculty at South Elementary School had achieved quality level 3, and 93% of teachers in Danville Community Schools had managed to implement all the expectations spelled out in quality level 1 (or higher). Only two teachers (7%) had been unable to achieve all the requirements of level 1.

When newly trained teachers are beginning to implement some of their quality learning (for example, attempting to move from level 0 to level 1 or level 1 to level 2), recognizing small wins is extremely important. Growth in use of specific tools and activities specified on a district's rubric may be more readily visible and quick to develop than overall progress through three or

four quality levels, each encompassing a number of challenging accomplishments.

At Danville, use of the plan-do-check-improve (PDCI) cycle for continuous improvement is one of the more prominent expectations on its quality rubric. In the past year, staff developers and coaches have targeted this important competency because it was perceived as one of the weakest links in the continuous improvement chain. Table 3 indicates measurable growth in most areas.

Table 4 indicates the number of teachers from Spinning Hills Middle School in Ohio who achieved specific expectations set forth on Mad River Local Schools' quality rubric. In example l, 19 teachers had implemented data folders with their students, and 25 had demonstrated use of at least two quality tools.

Dan Dodds, former director of curriculum and instruction for Mad River Local Schools, acknowledges, "We experienced mixed success in deploying [the rubric] throughout the district. It helped spur discussion and clarify some expectations. We recreated the tool to match well with our district philosophy and expectations."

Figure 2 (p. 44) indicates Mad River Local Schools experienced measurable growth in deployment of quality principles and tools as evidenced by the increased number of teachers reaching each of the four levels of their rubric.

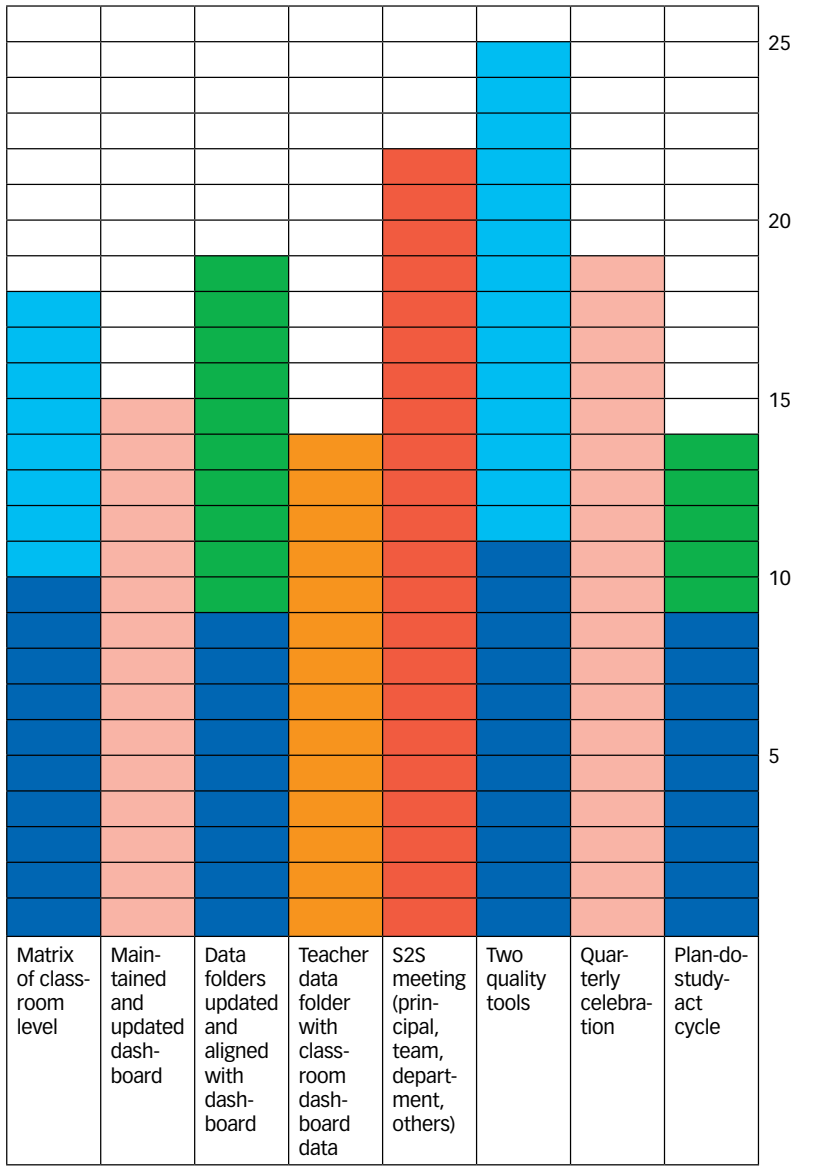
Vickki Reese, a teacher at Mad River Middle School, says, "The quality rubric has changed the way I approach teaching. It gives my students, me and my classroom direction and guidance toward our goals. Students are more self-directed and are achieving at higher levels. I am amazed at how the systems approach can truly change my quality of teaching and student learning."

Kim Thompson, of Mountain View Whisman School District in California, says, "The administration loves having a methodology [a quality rubric] to measure if the training is being implemented. Teachers have said it helps focus them, but others are worried they can't keep up at this rate."

Districts such as Washington Community Schools in Indiana are creating deployment rubrics for other key strategies, including best practice reading and writing approaches. Rebecca Dayton, assistant superintendent, says, "We liked the idea of a quality rubric so much that we have developed rubrics for key literacy initiatives. The tools help our teachers understand exactly what is expected—how they can engage in best practices for the benefit of our students."

At the state level, the Indiana Coalition of Quality Schools has developed a four-level rubric that guides districts as they implement a continuous improvement

Spinning Hills Middle School achievement of level 2 elements / TABLE 4



culture system-wide. Whether the focus is the classroom, school, district or state-level organization, once expectations have been clarified, baseline data collection can foster dialogue, goal-setting, professional development and recognition. Improved student and employee engagement, satisfaction and achievement will be impacted once the continuous improvement culture begins to take root.

Implementation suggestions

Don't forget to engage employees from the outset. Review reasons for the quality rubric and solicit input in the formation of the rubric. When people help create a list of guiding expectations, they are more likely to be intrinsically motivated to achieve the desired outcome. Carefully plan the type of support that staff will need.

Schedule recognition and celebration opportunities to acknowledge growth toward personal, school and district goals. Clear expectations, aligned staff development and recognition will help you weather the resistance-to-change storms that will surely rumble through your system.

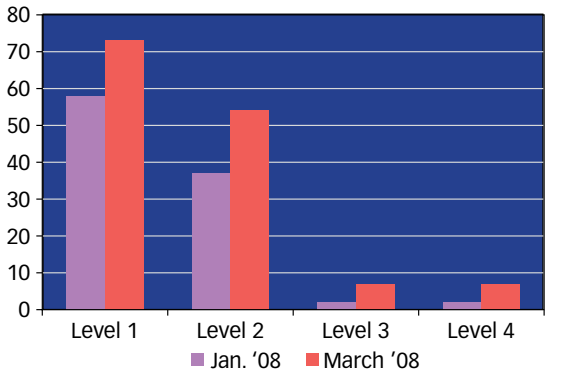
Once you have established a deployment rubric for quality, perhaps the most important support system requiring attention will be professional development. Adding "implement data folders with all students" on the quality rubric requires that you provide training, cultural artifacts (sample data folders) and classroom coaching in the use of data folders. "Professional development is key, and we created an extensive training plan with examples, PowerPoint presentations, directions for each component and videos of teachers in action," says Dodds, the former curriculum and instruction director.

"We expected less push-back in the beginning," says Plahitko from Danville Community Schools. "However, as we move forward, the rubric has provided a pathway that teachers can use to improve student involvement and achievement."

Dodds recommends, "Go slow to go fast later—all new initiatives are a change. Making effective change can be difficult."

If expectations for staff regarding the key elements of the new continuous quality improvement culture are not clear, results will be mediocre.

Number of Mad River teachers reaching each level / FIGURE 2



If you are serious about quality, create an aligned, soft system that begins with a deployment rubric, and then link professional development, coaching, sample artifacts, goal-setting, recognition and professional learning communities so the system is continually evaluated and improved.

One team at Spinning Hills Middle School in the Mad River district set the following goal: "All teachers will achieve at least a level 2 on the classroom quality rubric by the end of the 2007-2008 school year."

Mad River Local Schools linked continuing renewal units or continuing education units (useful for maintaining professional licensure) for achievement of each level of the rubric.

Consistent use of the principles and quality tools listed in classroom and school rubrics influences student perceptions about the nature of education. These comments from Mountain View Whisman are typical:

- "I enjoy that we get to share our thoughts. We can tell if we have problems or if we're struggling, but most of all it makes me feel like I have a voice, and I control what happens with the classroom."
- "Continuous improvement is really affecting my learning in a positive way. It makes me determined because I know there is a goal."

Thompson advises, "Go slow, but retain your high expectations. Be clear and precise in the language you choose to put in your rubric. Collect baseline data. Have a system to col-

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lect and compare data over time. Have a timeline. Listen to your customers."

Requirements and recognition

A unified human performance model attempts to identify many, if not all, of the problems associated with poor results in organizations.[10] The list of factors contributing to high performance includes the need for precise goals, clear policies, incentives, cognitive support such as rubrics or other job aids, feedback and staff development.

A well-designed quality rubric helps leaders meet each of these requirements. One author writes, "Quality doesn't happen when high standards are set. It happens when leaders consistently enforce and reward these standards."[11]

In other words, just saying you would like to see quality in each classroom, school or department won't get the job done. You must express high expectations for implementation, monitor activities and recognize growth.

If you are serious about achieving a high level of quality implementation throughout your system, a deployment rubric will be an important tool, one that sends a consistent message of high expectations to all stakeholders. QP

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In 50 Words Or Less

- ISO 9001:2008 clarifies legal requirements, outsourcing, competence, design and development, internal audit, monitoring and measurement of processes, and control of nonconforming product.
- The new version can be used as a way to improve your organization's quality management system and profitability.
- There is a 24-month implementation plan.

SMALL CHANGE Big Payoff

by John E. "Jack" West

Minor revisions in **ISO 9001:2008** **can lead to major** benefits

LITTLE HAS CHANGED in the new, fourth edition of ISO 9001, which was issued late last year by the International Organization for Standardization.

ISO 9001:2008, the revised quality management standard, contains no new requirements, so the transition should be painless for most organizations. Many of the changes simply clarify the requirements that were in the 2000 version. Other minor changes in wording enhance compatibility with ISO 14001, the environmental management standard.

That's good news for organizations already certified to ISO 9001:2000. They'll need to do very little to conform to the revision.

But, the revision is a good excuse for organizations to review their quality management systems (QMS) and upgrade where it's needed. In the end, that can boost profitability.

Examples of changes

A brief discussion of a few of the changes (see Table 1 for a list of all the clauses that were revised) should be helpful to users of ISO 9001:2008.

Legal requirements: The revision clarifies and standardizes text related to legal requirements. In referring to legal requirements, ISO 9001:2000 sometimes used the term "regulatory" requirements. This has been consistently changed to "statutory and regulatory" requirements, reflecting the original intent.

Of course, some organizations may have interpreted the word "regulatory" in the narrowest of senses, but even so, it should not matter because compliance with the law is always required.

Outsourcing: This topic has long been a source of conversation, if not confusion, among users of ISO 9001. ISO 9001:2008 adds two new notes to clause 4.1 to describe an outsourced process:

- Note two says an outsourced process is one needed for the organization's QMS but is chosen to be performed by a party external to the organization.
- Note three says ensuring control over outsourced processes does not absolve the organization of the responsibility of conformity to all customer, statutory and regulatory requirements. The type and extent of control to be applied to the outsourced process can be influenced by factors such as the potential impact of the outsourced process on the organization's capability to provide product that conforms to requirements, the degree to which the control for the process is shared and the capability of achieving the necessary control through the application of clause 7.4.

These notes help users better understand what the standard means by "outsourced process" and that the organization is required to control processes. On the other hand, it was not feasible to answer all questions on the subject within the standard itself. So, technical committee (TC) 176 has updated its introduction and support package, adding a module called "Guidance on Outsourced Processes."[1]

Competence: There has been a misconception that the competency requirements apply only to individuals directly related to product realization. In fact, the intent was that these requirements apply to anyone performing any task within a QMS. A note explaining this has been added to clause 6.2.1.

There has also been confusion about what is meant by the words "satisfy these needs" in clause 6.2.2b. The intent was that organizations determine what competencies are needed and provide training or take other action to achieve the necessary competence. The ISO 9001:2008 text now clearly states that intent.

Design and development: Minor edits have been made to clauses 7.3.1, 7.3.2 and 7.3.3. Perhaps the most worth mentioning is the addition of a note in 7.3.1 to better explain that design and development review, verification and validation have distinct purposes but may be conducted and recorded separately or in any suitable combination.

Control of monitoring and measuring equip-

Changed or rearranged ISO 9001:2008 clauses / TABLE 1

Foreword	7.3.1 Design and development planning
0.1 General	7.3.2 Design and development inputs
0.2 Process approach	7.3.3 Design and development outputs
0.3 Relationship with ISO 9004	7.3.7 Control of design and development changes
0.4 Compatibility with other management systems	7.5.1 Control of production and service provision
1.1 General	7.5.2 Validation of processes for production and service provision
1.2 Application	7.5.3 Identification and traceability
2. Normative references	7.5.4 Customer property
3. Terms and definitions	7.5.5 Preservation of product
4.1 General requirements	7.6 Control of monitoring and measuring devices
4.2.1 Documentation requirements—general	8.1 Measurement, analysis and improvement—general
4.2.3 Control of documents	8.2.1 Customer satisfaction
4.2.4 Control of records	8.2.2 Internal audit
5.5.2 Management representative	8.2.3 Monitoring and measurement of processes
6.2.1 Human resources—general	8.2.4 Monitoring and measurement of product
6.2.2 Competence training and awareness	8.3 Control of nonconforming product
6.3 Infrastructure	8.4 Analysis of data
6.4 Work environment	8.5.2 Corrective action
7.1 Planning of product realization	8.5.3 Preventive action
7.2.1 Determination of requirements related to the product	Annexes A and B and the bibliography

Good **improvement processes** generally start with **data collection and analysis.**

ment: In ISO 9001:2000, clause 7.6 consistently referred to measuring "devices," with the intent that the user would understand the word "device" to be a broad term covering many different items that might need appropriate controls.

Unfortunately, some translators interpreted "device" in as narrow a sense as possible so that in some instances, control was exercised for a single component of a measurement system when measurement results were controlled by several parts of the measurement system. ISO 9001:2008 changes measurement "devices" to measuring "equipment."

Internal audit: Users will recall that clause 8.2.2 of ISO 9001:2000 said, "The management responsible for the area being audited shall ensure that actions are taken without undue delay to eliminate detected nonconformities and their causes." Some users have posed two questions about this statement:

1. What kinds of actions are intended?
2. What constitutes undue delay?

ISO 9001:2008 requires managers to ensure that "any necessary corrections and corrective actions are taken." There has been no change to the provision that these actions be taken without undue delay. It would be hard to develop better language, though perhaps a note that says "use common sense" could have been added.

Monitoring and measurement of processes: There is a requirement in clause 8.2.3 that the organization apply "suitable methods for monitoring and, where applicable, measurement of … processes."

This subject has been and certainly is always likely to be a source of much conversation and debate among users. The question is, how far do you go? From an ISO 9001:2008 point of view, that boils down to the legitimate question, "How far am I required to go for my processes?"

ISO 9001 does not say it, but the question has a rational answer: You are required to go as far as is necessary to establish, maintain, improve and demonstrate that your processes operate under controlled conditions to achieve output requirements.

Extensive measurement of process parameters is sometimes needed. Often, limited measurement of process output is sometimes sufficient. Sometimes, process monitoring by observation alone is sufficient. In other words, the right answer is, "It depends."

ISO 9001:2008 adds a note that provides some explanation. Rather than being concerned about how far to go to meet the requirements of the standard, the organization could analyze internal and external cost-of-quality data and customer-complaints data to decide how much process monitoring and measuring is prudent.

A new note added to clause 8.2.3 says, "When determining suitable methods, it is advisable that the organization consider the type and extent of monitoring or measurement appropriate to each of its processes in relation to their impact on the conformity to product requirements and on the effectiveness of the quality management system."

Control of nonconforming product: The major issue with clause 8.3 of ISO 9001:2000 has always been that it is very hard to apply directly to services.

Normally, if a service is nonconforming, it has already been delivered to the customer and there may be no way to correct the situation directly. A simple example might be delivery of a package. If the delivery is late because it was misdirected in transit, there is no way to return to the past and redirect the package correctly.

In such cases, some express companies refund part or all of the shipping charge. But that is still not a correction of the nonconforming service; it is better termed a recovery action to compensate for the problem. A new option has been added to the list of ways an organization may deal with nonconforming product.

New text in clause 8.3 says, "Where applicable, the organization shall deal with nonconforming product by taking action appropriate to the effects, or potential effects, of the nonconformity when nonconforming product is detected after delivery or use has started."

As is apparent, the new note allows consideration of the effects of the nonconformity, not just the nonconformity itself. This may help in situations such as the delayed package example.

Helpful list of all changes

A new Annex B lists all the changes made from the 2000 version. The table in the annex gives the full text of each change with text that has been deleted lined through and the new text underlined. It is a great tool, but it is not perfect.

In the development of the new edition of *ISO 9001:2008 Explained*,[2] I found several errors in the table. It would be a good idea to use the table along with the text of ISO 9001:2008 itself. But, even with its nonconformities, the table is a big help for those seeking to understand the precise textual changes.

Introduction and support package

The updated introduction and support package for ISO 9001 is available online for free download.[3] Even if you have long ago downloaded, used and forgotten the versions that were issued for ISO 9001:2000, you should get these new documents. They have been updated to serve as companions to ISO 9001:2008. The changes are substantial and have resulted in a much improved package.

While the introduction and support package documents are official ISO TC 176 documents, they are much less formal and easier to update than guidance standards or technical reports.

The following is a brief description of each module in the package:

- "Implementation Guidance for ISO 9001:2008" gives background on this new edition of ISO 9001, provides implementation guidance for users and answers frequently asked questions.
- "Guidance on ISO 9001:2008 Sub-clause 1.2 Application" explains and gives general guidance related to exclusions that may be claimed by ISO 9001:2008 users. There is also an annex that gives examples of typical situations.
- "Guidance on the Documentation Requirements of ISO 9001:2008" explains the documentation requirements and discusses development of documented statements of quality policy and objectives, a quality manual, documented procedures and other documentation that may be needed.
- "Guidance on the Terminology" used in ISO 9001 and ISO 9004 gives common dictionary definitions of common words used in these standards.
- "Guidance on the Concept and Use of the Process Approach" for management systems provides an understanding of the concepts, intent and application of the process approach to the ISO 9000 family of QMS standards.
- "Guidance on Outsourced Processes" was discussed earlier in this article.

If you used the earlier documents, you'll find the new ones simpler and easier to reference. The new module on terminology is much more comprehensive in its listing of general terms that are used in ISO 9001:2008.

Terms that are formally defined in ISO 9000:2005 are not included, so the user needs to consult that standard for those definitions.

What hasn't changed?

ISO 9001:2008 is a clearer statement of the same requirements found in ISO 9001:2000. It is true that no new requirements have been introduced, but it is also true that no requirements have been deleted.

On the other hand, adoption of the new document provides an opportunity for organizations to review their system and upgrade it where needed. Perhaps the best focus for such a review is the area of quality improvement.

No area of quality can motivate people as much as improvement. When improvement processes are well planned and executed, people get enthusiastic. But, if this part of the QMS is given little planning attention, negative results and frustration often follow. Refocusing the system on improved performance, better quality and lower cost can motivate everyone in an organization.

Subclause 8.1 of ISO 9001 requires organizations to plan their processes to demonstrate product conformity, ensure QMS conformity and continually improve QMS effectiveness. The first two requirements are obvious and have been part of ISO 9001 from the beginning. The third—planning for continual improvement—is a concept that was added to ISO 9001 in the 2000 version.

This addition, coupled with adopting the process approach, constituted the most significant improvements ever made to ISO 9001. The requirement for planning improvement starts with

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People get **enthusiastic** when improvement processes are **well planned and executed.**

subclause 4.1, which requires the organization to establish, document, implement and maintain a QMS and continually improve its effectiveness.

Subclause 4.1 also requires organizations to identify the processes needed for the QMS and their applications throughout the organization and to implement actions necessary to achieve planned results and continual improvement of these processes.

Subclause 5.4.2 on QMS planning requires an organization's top management to ensure the planning of the QMS is carried out to meet the requirements given in subclause 4.1, as well as the quality objectives. In other words, there are links among the various clauses of ISO 9001 relating to improvement planning.

The overall QMS planning needs to identify how process improvement will be achieved and how the system will be made better as a result.

Good improvement processes generally start with collection and analysis of data. This involves all types of data, such as measurements of process variables, customer feedback and satisfaction, measures of product or service parameters, and audit results.

The improvement process relies primarily on two system elements:

1. The corrective action process and internal audits.
2. Correction only of nonconformities.

This sometimes leads to a situation in which two improvement programs exist: a formal one for ISO 9001 certification (the one that doesn't work) and a real one that has top management support and achieves results.

Successful QMS improvement planning has several characteristics:

- **Top management is fully engaged.** Top managers are directly involved through serious decision-making discussions during management reviews. Projects for improving the system and its results are championed by the organization's leaders.
- **There's one integrated improvement strategy.** Tools, techniques and strategies used for improvement are integrated. There are no improvement turf wars.
- **The improvement processes are data-rich**. Data on products, processes and customers (including customer satisfaction, sales and market data) are aggregated, summarized and presented in an integrated manner. Appropriate data are presented in the language of top management—money. This enables top leaders to see the relationship between internal quality measures and customer behaviors.
- **The corrective action program focuses on making improvements that are important to customers and to achieving the organization's own objectives.** There's a bias against expending resources on the trivial details that slow down some corrective action processes.
- **Improvement strategies involve active use of**

HANDLING THE TRANSITION

The International Organization for Standardization (ISO) and the International Accreditation Forum (IAF) have developed and agreed on an implementation plan to ensure a smooth migration of accredited certification from ISO 9001:2000 to ISO 9001:2008.

The implementation plan regarding accredited certification has the following provisions:

- Accredited certification to ISO 9001:2008 was not permitted until it had moved through all of its draft stages and was published as an international standard late last year.
- One year after publication of ISO 9001:2008, all accredited certifications issued (new certifications or recertifications) must be to ISO 9001:2008.
- Two years after publication by ISO, any existing certification issued to ISO 9001:2000 will not be valid. *—J.W*

the tools of prevention, such as failure mode effects analysis and risk analysis. Every time there's a change to a system process, the organization automatically asks appropriate "what if" questions to identify potential process failures.

- **The audit program is used to identify potential improvements that will improve customer satisfaction and reduce risk.** Just as informal audits are required to maintain continued conformance to the QMS, identification of these opportunities for improvement should be a mandatory, planned part of the audit program.
- **The improvement process is simple and easy for everyone to understand.** Developing a workable and successful plan for data analysis and improvement requires a great deal of thought. Grand plans for improvement processes are useless if they can't be implemented. Organizations need to ask themselves whether they have the resources (talented people and analytical tools, for example) to accomplish this realistically and usefully. If you don't have the resources to be fancy, start small, work smart and focus on achieving real results.

Action?

So what is the bottom line? For me, it is that most organizations that just company with the words of ISO 9001:2000 in the most minimal way possible will have some work to do to demonstrate conformity to ISO 9001:2008.

That won't be true for organizations certified to the standard in a way that conforms to its intent. They won't need to do much, if anything.

On the other hand, it would be a shame not to review and improve your organization's QMS and, ultimately, its profitability. QP

REFERENCE AND NOTE

1. "Guidance on Outsourced Processes," along with the entire ISO TC 176 introduction and support package, can be found at www.iso.org and www.iso.org/tc176/sc2.
2. John E. West and Charles Cianfrani, *ISO 9001:2008 Explained*, ASQ Quality Press, 2009.
3. See note 1.

JOHN E. "JACK" WEST is co-author of six books published by ASQ Quality Press. The latest is the newly updated and expanded ISO 9001:2008 Explained *(ASQ Quality Press, 2009). West, an ASQ fellow, is board chairman of Silver Fox Advisors, a Houston-based organization of executive mentors, management consultants and business advisors. He is past chair of the U.S. technical advisory group to ISO TC 176 and lead delegate to the committee responsible for the ISO 9000 family of quality management standards.*

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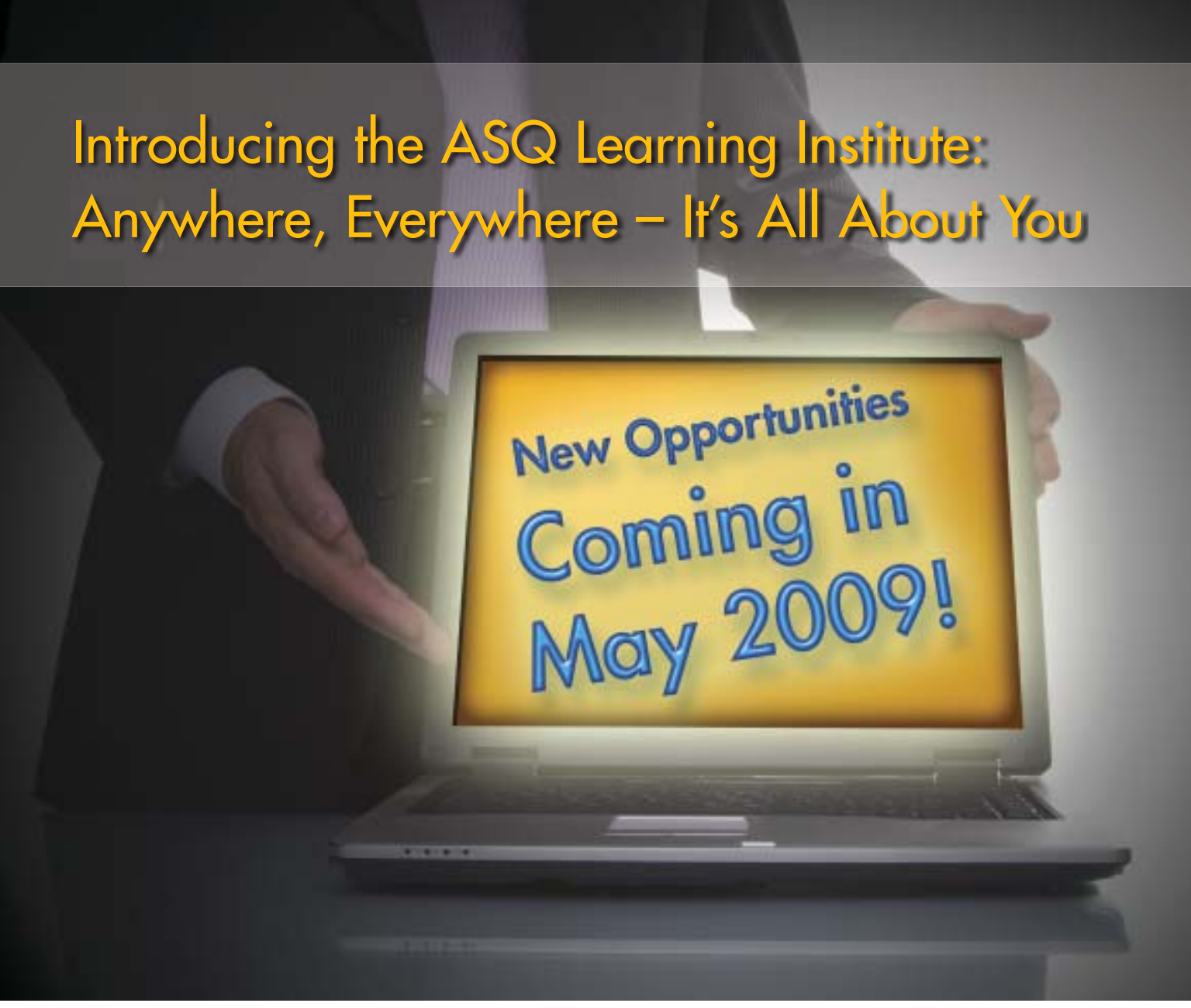

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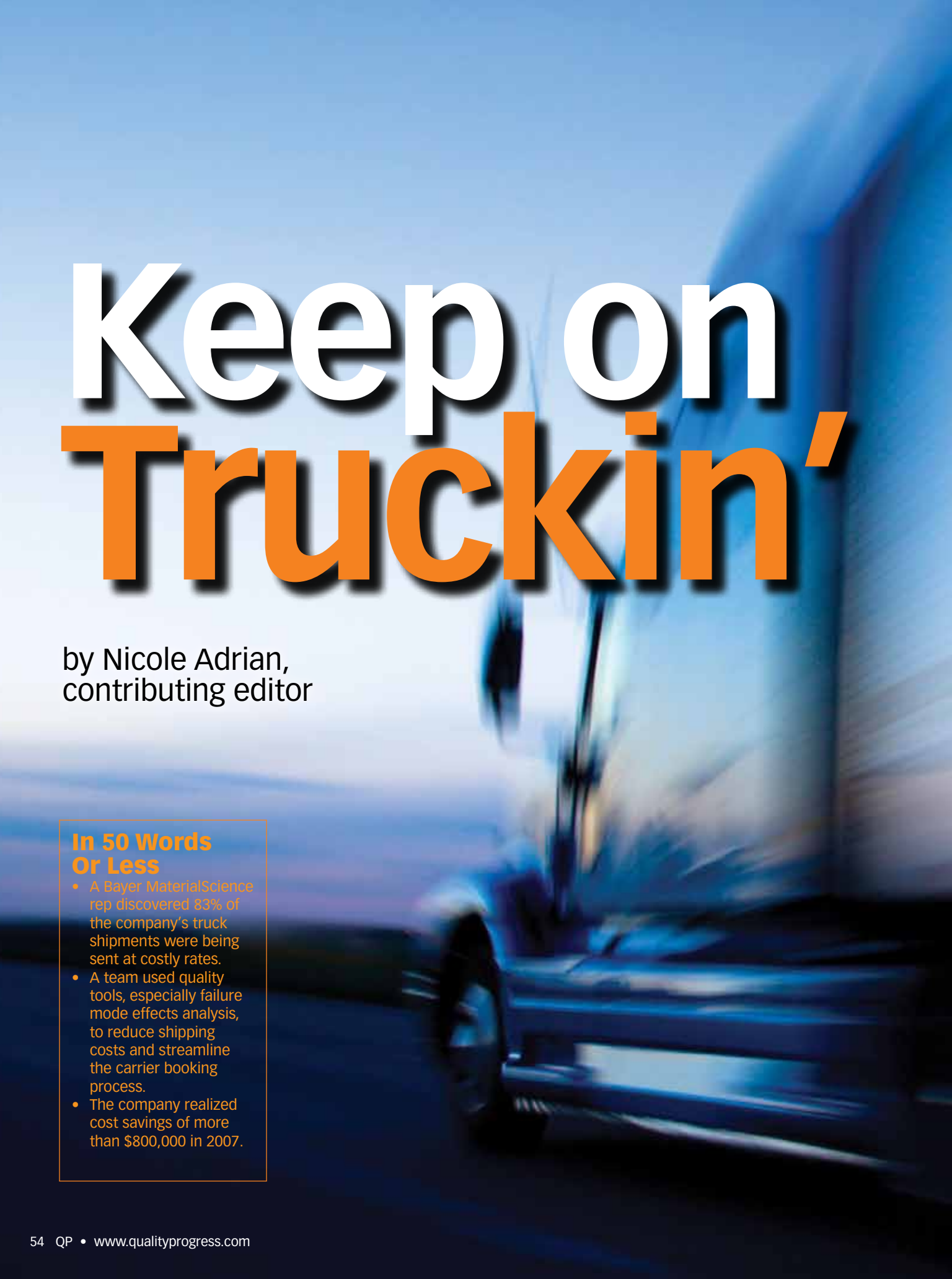
Keep on Truckin'

by Nicole Adrian,
contributing editor



In 50 Words Or Less

- A Bayer MaterialScience rep discovered 83% of the company's truck shipments were being sent at costly rates.
- A team used quality tools, especially failure mode effects analysis, to reduce shipping costs and streamline the carrier booking process.
- The company realized cost savings of more than $800,000 in 2007.

Team uses **quality tools** to realize cost savings, **simplify processes**

IN JULY 2005, a transportation representative at Bayer MaterialScience identified a potential problem with the way the company chose its shipping carriers. Bayer, a global manufacturer of polymers used as raw materials for products such as compact discs and automotive finishes, ships billions of pounds of material each year to thousands of customers, so shipping costs are a significant component to the cost of goods sold.

From examining a sample of truck shipment data in the 16,000 to 25,000-pound range, the representative observed that 83% of jobs were shipped suboptimally, or at a higher-than-necessary cost. Extrapolating this rate of suboptimal shipping revealed that more than $1 million in savings could be achieved if shipping was executed correctly.

A team at Bayer decided to pursue ways to drive down shipping costs and simplify the process. After reviewing a preliminary assessment of the problem, team members believed correcting the shipping problem would:

1. Align with organizational goals, including developing lean Six Sigma as a core competency.
2. Produce a high return on investment. The team was confident the project would cost much less than the $1 million cost of continuing as is.
3. Get needed support. Key stakeholders agreed this was a significant problem and that they would provide resources to correct it.

The team later presented its findings from the "Truckload/Less than Truckload Optimization" project and earned a bronze medal at the International Team Excellence Competition at ASQ's 2008 World Conference on Quality and Improvement.

Starting out

One of the most important first steps was to identify potential stakeholders for the core team and gauge the project's impact on them. Several segments of the organization were identified as potential stakeholders:

- Financial.
- Bayer Technology Services.
- Logistics strategy and procurement.
- Business excellence.
- Customer master data.
- Business intelligence.
- Customer service.
- Material master data.

Stakeholders from these areas participated in the development, evaluation and eventual endorsement of the project charter. The charter included a suppliers, inputs, process, outputs and customers (SIPOC) diagram; a value stream map to clearly view the as-is process flow and identify decision points, organizational transitions and potential nonvalue added steps; and a preliminary project timeline in a Gantt chart.

To determine the degrees of potential impact to stakeholders, representatives used subjective tools, such as cause and effect analysis and value stream mapping, and objective tools, including customer data segmentation and on-time, in-full key performance indicators. From here, the core team could see which stakeholders had higher potential positive and negative impacts, and could plan accordingly (see Table 1).

Types of potential impacts to stakeholders / TABLE 1

Stakeholder	Potential positive impact	Potential negative impact
Customer master data	Could make their job easier	Conflict with existing workload, could cause confusion
Business intelligence	Increased project competency	Conflict with existing workload to obtain data for team use
Material master data	Could make their job easier	Conflict with existing workload
Finance	Participation in a project that improves profitability	New key performance indicators (KPI) to create and monitor
Transportation operations	Simplified decision-making process	Loss of decision-making power regard carriers
Logistics	Better performance against KPI, on-time, in-full	Carrier damages from cross-docking more less than truckload (LTL)
Carriers	Contract compliance, more business	Loss of some revenue
Customers	Better customer service from Bayer MaterialScience	Carrier damages from cross-docking more LTL
Business excellence	Increasing lean Six Sigma (LSS) competency	Project failure would damage LSS credibility

Get to the root of it

The team used various quality tools to identify root causes and opportunities for improvement, beginning with process variables mapping. By building on the SIPOC already developed, the team identified input variables and assessed the degree to which each was under its control.

From there, the team developed a cause and effect matrix in which team members estimated the degree of impact of various input variables on output performance. This information helped the team think ahead about data segmentation that would be desirable for analysis. At each step along the way, the team challenged the origin, operational definitions and potential sources of inaccuracy of bias in the data.

Having become confident in the reliability of the data, the team began the analysis phase to identify potential root causes and opportunities for improvement. Failure mode effects analysis (FMEA) and data segmentation were the team's principal analysis tools.

For the FMEA, the team identified potential failure modes and ranked each in terms of its probability and

frequency of occurrence, the severity of the impact should it occur and the team's ability to detect failure. This yielded a risk probability number (RPN).

With a sample size of more than 300 shipments per month and extraction of granular data for each shipment—such as date, carrier, mode, origin, destination and cost per pound—the team was in a position to stratify and segment the data in an attempt to gain insights into the relationship between cost per pound and a variety of potential input variables.

At the outset of the project, the team suspected the reason shipping costs were so high was because the company was incorrectly shipping too much with full truckload (TL) carriers as opposed to less than truckload (LTL) ones.

In a data-stratification example, the team grouped shipments into arbitrary weight brackets and examined the percentage of shipments shipped LTL versus full TL. It was clear there was an opportunity to direct more shipments to the lower cost LTL mode.

The team defined a defect as a shipment within a certain weight range shipped as full TL instead of LTL. The proportion shipped incorrectly according to this definition gave the team a different perspective when viewing baseline performance.

Obstructed view

To select the final root causes, the team ranked each potential failure mode on the basis of RPNs—those with the highest numbers were judged to be root causes with the highest impact.

The failure mode with the highest RPN was found in shipment consolidations. It identified that the transportation representative could not view consolidation opportunities in the system. Four additional root causes appeared repeatedly on a list of the highest RPNs:

- Text messages required a two-step drill-down. They were only checked if the representatives had time.
- A special computer screen was "really ugly." Representatives couldn't sort for important information, and special requirements and consolidation opportunities were all but invisible.
- Guidelines for when to choose TL or LTL were unclear. There was no statistically based guideline, and representatives often did not know any backup carriers. Routing guide usage was spotty, and if all else failed, shipments were sent TL.
- Lack of planning time consumed logistics representatives: There was a three-day delivery window, carrier turndown rates were high and significant rework was required when turndowns occurred.

Grouping these similar potential causes for each failure mode resulted in a list—thus, affinity mapping provided the first level of validation. Another validating observation was the reaffirmation of the links between failure modes in the FMEA and the key input and output relationships in the cause and effect matrix.

Finding a solution

To develop a solution to target the root causes, the team used two key tools. One was design FMEA, which entailed developing a potential improvement or corrective action for each of the 50 failure modes identified within the FMEA. These corrective actions were designed to mitigate or significantly reduce the probability of occurrence or increase the detectability of a given failure mode.

The other key tool was organizational process mapping. The team developed a new process flow, which eliminated nonvalue added steps and added missing steps based on what had been learned from cause and effect, FMEA and the original process map.

A force field analysis of the feasibility for implementing an improvement versus the RPN of the failure mode it addressed was used to select and prioritize final improvements. The team realized six improvements that could be implemented immediately and with relatively low costs: move text messages to master data, enable routing guides, update carrier data, code carrier selection tiers into system, improve computer program sorting and increase TL/LTL breakpoint.

The key analysis used to select final improvements was a synthesis of results obtained from:

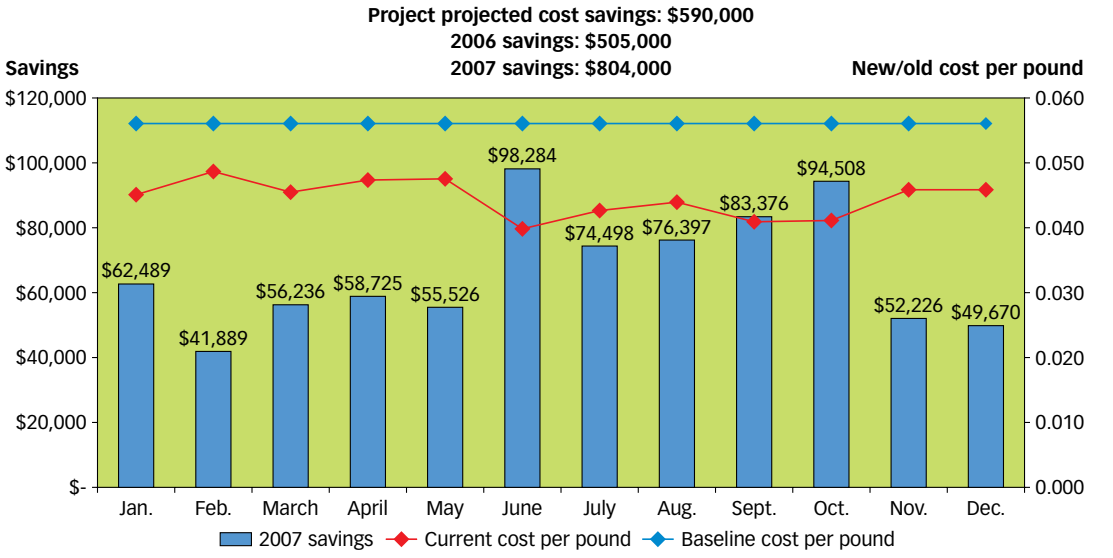
- Improvement opportunities associated with failure modes with the highest RPNs.
- Analysis of value added and nonvalue added steps within the organizational process map.
- Assessment of feasibility of implementation versus impact of implementation.

A detailed action plan was developed for implementation in which each task was identified, assigned and a deadline established. The core team met regularly to assess progress and make adjustments as necessary.

The good news

All the hard work paid off. Each of the goals, perfor-

Tangible benefits / FIGURE 1



mance measures and identified strategies was affected positively. Shipping costs per pound went down by 0.8 cents, which came to more than $1 million per year. Elimination of nonvalue added steps reduced the complexity of the process and supported the team's simplification goal.

Overall, the team identified four major improvements:

- Established a new weight breakpoint in carrier tables. The team hard-coded carrier recommendations into its system.
- Improved sorting capability in transportation software. Representatives can now see the consolidation opportunities, and this enables the system to sort based on origin, weight and destination.
- Enhanced the carrier table update process. The identification and updates of carrier records were dramatically improved.
- Enabled the use of routing guides. Routing guides provide four carrier choices.

The team also worked to inform the product planning department about missed opportunities to use lower cost intermodal equipment due to lack of planning time and embedded text messages in the master data to prevent mistakes.

Many intangible benefits were also realized:

- Customer service, logistics representatives and planners being trained on what costs are generated through the use of certain requirements.
- Best value transportation decisions visible to logistics representatives.
- Smoother workflow and less hassle for transportation reps.
- Faster training times for new transportation reps.
- Better relationships with carriers.
- Better compliance with routing guides.
- Cross-functional process knowledge.
- Increased competency and confidence in lean Six Sigma.

Cost reduction was the key objective and most tangible measure of the improvements (see Figure 1). The improvements were implemented in February 2006, and the team validated $505,000 in savings for that year. In 2007, costs were reduced by more than $800,000.

The project continues to generate positive results. New measurements were established to chart the cost per pound of shipments within the affected range. Additionally, carrier shipment refusals are down by 50% in the one to two-day notice timeframe and down about 30% for the same-day notice. This had a collateral, positive impact on transportation representatives, who now spend less time chasing backup carriers to make transportation arrangements. QP

NOTE

This article is based on the presentation the Bayer MaterialScience project team delivered at ASQ's World Conference on Quality and Improvement on May 16, 2008. The 64-slide presentation is available at http://wcqi.asq.org/2008/team-competition/pdf/2008-bronze-presentation.pdf.

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Smart Talk

Use common language to communicate Six Sigma effectively

WHEN YOU EXAMINE the success of Six Sigma at Motorola, one characteristic that is frequently listed as a critical success factor is the common language it created. That attribute meanders its way into all types of Six Sigma conversations.

Speaking a common language seems to be one of those speculative assertions people proclaim with everybody nodding his or her head in acceptance and nobody raising a hand to ask, "What does that mean?" It seems odd that common language would even be mentioned when wave after wave of Green Belts, Black Belts and Master Black Belts have attacked business issues after having been empowered with a method that employs a group of statistical tools. How can something as simple as words be of any importance?

Perhaps it isn't just a common language. Maybe common language enables common understanding—when someone says or writes something, and someone else understands exactly what that person intended for them to understand.

Understanding sounds more credible when you are faced with the daunting task of transforming entire corporations. It seems more plausible that common understanding is the primary avenue through which value is delivered in the transformation process.

I need to convey information, knowledge and ideas using a common language to create a common understanding. Therefore, I will use a process we call communication. Maybe that is where the value comes from. The common language reduces variation in the output of the communication process; the message is understood exactly as it was intended. That sounds very Six Sigma-ish.

Reducing variation in the communication process makes sense in terms of transforming organizations. When was the last time you saw an organization conduct some type of morale survey, and communication wasn't on the list of issues employees had with management? You would think with the technology we have today that communication volume would not be an issue. In fact, many clever vehicles are employed for delivering messages to people in an organization. But how annoying is it to hear the same message over and over?

More isn't always better

Maybe the issue isn't the volume of communication, but rather the quality of the communication. When we deploy Six Sigma, the common language supports common understanding. Common language reduces variation in the way messages are understood. Consequently, communication becomes more effective. We get the financial benefits of a Six Sigma deployment as we resolve the chronic communication issues, which are unquantifiable.

As true believers in the Six Sigma method, we should recognize this possibility as a hypothesis worth testing. The null hypothesis would be that communication before and after the Six Sigma deployment is the same. The alternate hypothesis would be that communication is not equal. It would be interesting to see how that turned out. Would communication get better, stay the same or get worse?

At this point, I would be willing to bet that Six Sigma makes the communication process worse. Why would we believe

that training a portion of the population of an organization to speak in a plethora of three letter acronyms (TLAs) will reduce variation in the communication process? Using the language of Six Sigma does allow us to speak with more precision, especially to someone who has also been trained in Six Sigma.

Audience awareness

One of those things that seems to stick in our brains from our college days, when we were trained, or at least exposed to public speaking, was to know your audience.

As a practicing belt, who would be your audience? Of course, in a collegial sense there would be your fellow belts. More important to your success as a belt would be your team and, of course, anyone associated with the implementation of the solution to your project. How many times do we stop to ask ourselves, before we speak, "Who is my audience?" Do we even ask ourselves that question when we address our process owners, stakeholders and Champions?

Perhaps some of the issues with sustainability of solutions really aren't issues with management support. Maybe the effects of our communication aren't optimal because we are employing what we have been led to believe is a common language.

Maybe the success of lean throughout the years is attributable to its use of common language because it is a bottom-up approach. Is that really true? Granted, lean conveys some concepts that are perhaps more intuitively understood without a lot of statistical terms. Is the audience more receptive? There may be potential for that. But what is it we do to enhance our communication when we are working with lean?

We use a plethora of Japanese words to convey things to people who don't speak Japanese. Why do we insist on using the word *muda*—the one we seem to use most often? We frequently substitute it when we want to refer to waste. What does substituting the Japanese word for waste do to enhance the communication process? The concept works conversely. You certainly would not enhance your communication with a Japanese audience by using English words when there are Japanese words more universally understood.

Recently, one our facilitators was preparing to run a *kaizen* event when he overheard a conversation between a couple of employees. One person remarked, "We are supposed to be getting a *kaizen* next week." The other person asked, "What is a *kaizen*?" The first person responded, "I don't know. But when they got one in the locomotive shop, they had to clear out the entire shop. It must be really big."

As humorous as that may sound, it is that lack of precision that creates confusion and stress. Neither confusion nor stress is conducive to creating a receptive or supportive environment.

When was the last time someone said something to you that you did not understand, so you asked them to translate it to a language you were not fluent in so you would understand it better? It doesn't happen that way because it does not make any sense. In spite of this self-evident truth, you hear people doing this daily—people who expect to deliver a precise message.

Maybe the issue isn't the **volume of communication,** but rather the **quality of communication.**

Clear communication

This is not about some ethnocentric protection of the language. Communication is an essential skill for belts. The most difficult part of any project is the implementation and institutionalization of a solution. That is not a process that happens in a vacuum. It is a process that happens with the active participation of a lot of people who are willing to be engaged in the solution.

If they don't enroll and the solution doesn't become institutionalized, then the project and everything associated with that project are just another form of the cost of poor quality (COPQ, for those who don't understand). More precisely, it could easily be the cost of poor quality communication.

The value that Six Sigma brings to communication is in its precision—assuming all parties engaged in the conversation are privy to the language. For decades, those in the business of quality and quality assurance have struggled for acceptance. Perhaps the language we have spoken for years isn't comprehensible to the people we are trying to enroll. The message is a good one, and some people listen. The Japanese listened, and they showed us the value of the message.

We now have an audience that is more receptive than it has ever been. To take advantage of the receptive audience, we have chosen to communicate with them via a lexicon that includes the language of statistics mixed with terms indigenous to quality and seasoned with some Japanese words to spice it up.

Why do we do this? So we can look at them condescendingly when they don't understand? Or is it because we need to confuse them to make them believe that our vapid contribution brings value because our existence is not readily justifiable otherwise?

In the communications process, whose responsibility is it to ensure that the recipients of the message understand what is being delivered?

It is ours.

The value that comes from the concepts behind the quality discipline is not in creating an elite group of people that are enlightened in ways others do not understand. The value comes from understanding, helping others understand and, as a result, delivering positive, visible and quantifiable change.

If we apply a basic concept of Six Sigma, we need to reduce variation and simplify the process of effective and efficient communication rather than continue to drive complexity and protect our tenuously elitist turf. QP

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Survive and Thrive

Highly skilled quality pros can make it through hard times

NO SECTOR is immune. Manufacturing, IT, finance, healthcare, education, publishing and retail are being affected by economic conditions that range from slowdown to slow-motion collapse.

For many, a job search is no longer an optional step in career development—it's a matter of immediate economic survival. Others await the next piece of bad news that may put them on the street. Given such serious risk, how should we behave? How should we develop strategies for our jobs and careers?

Driver safety analogy

To illustrate, let's use what we learned in driving school. Why? Because of all daily activities, driving is the riskiest. We may fear snakes, spiders, bird flu and public speaking, but they don't kill many of us.

According to the Smith System, there are five keys to success in driving.[1] The five keys also apply to careers.

The Smith System's first key to success is to aim high in steering. Understand, evaluate and act on all of the information you have. Under threat, people respond to immediate circumstances, rely on previously learned behavior and may limit channels of information—especially as they see distress everywhere.

The most important information you need, however, is about yourself in relation to your environment, market and technology. What do you bring to work? What are your skills, orientation and experience? How are these relevant to emerging fields and to the training and education required by them? Green technology, power engineering and managing supply chain risk may call you, but are you ready?

The second key is get the big picture. Quality professionals have long advocated systems thinking in organizations, employing disciplined techniques to keep from jumping to solutions before seeing the whole. What is the big picture for the industry in which you work? What political, economic, social and technical trends are affecting it? Are these likely to persist? For how long? From a larger, strategic (not just company and job) perspective, what is the likely future? Think like a CEO but without too much management jargon.

Misleading statistics

Third, keep your eyes moving to scan changes in the environment. For those who remain employed in times of uncertainty, scanning may itself become a difficult challenge.

The same holds true for those seeking work or surviving at new jobs—often at lower pay, with fewer benefits and diminished professional identity. Some, confronted by unremitting bad news, stop seeking full-time employment altogether, perhaps cobbling together part-time jobs, to fall among those no longer even counted in government statistics.

This situation isn't new to those who were buffeted by economic churn while Wall Street bonuses and corporate profits rose along with house prices and the size of SUVs.[2] It is new to those in arenas such as state and local government, finance, and industries—including IT, which in spite of outsourcing had been regaining competitive advantage through lean practices and innovation.

HARD HIT BY THE RECESSION?

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The author makes no guarantees but provides the kinds of trend data—beyond daily headlines—and integral perspectives you need for your own big-picture scan for opportunities.

The fourth key is to always leave yourself an out. In driving, this means using space to stay out of harm's way. In careers, it applies to professional development and contingency planning. What is the scope of your career? Is it bounded by a single function or job? If so, you have little space to maneuver. What new projects, training or education will allow you greater latitude? What plans have you made for a possible move—voluntary or involuntary?

Remember, those who have noticed where outs (exits) are and have mentally rehearsed using them have the best chances for surviving a crash of any kind.

Finally, the fifth key—make sure they see you. If you want to remain among the core employees in your organization, your value has to be apparent to your boss and coworkers—not only in the tangible results of your projects, but also in your role as supportive colleague. Their opinions count when it comes to references, networking and even new job offers. If you are planning a change to consulting or contracting, perhaps taking on your newly outsourced job, or if you are actively conducting a job search, you need to be visible.

Active participation in ASQ is another means to remain visible and to maintain professional identity by holding office, gaining certifications, speaking, writing for its publications and developing a supportive network. QP

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BY ROBERT L. MASON
AND JOHN C. YOUNG

A Correlation Encounter

Addressing a common phenomenon for processing industries

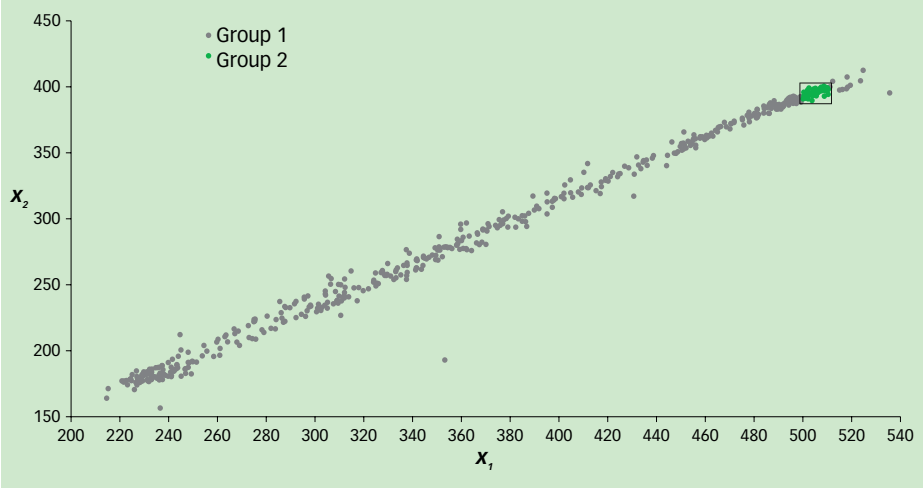
DURING A RECENT VISIT to the control room for a processing unit, a new process engineer asks the question: "Why doesn't the correlation between the two process variables, x_1 and x_2, match the correlation as suggested by the theory?"

He explains the correlation between these two variables, based on data taken from daily runs, seldom, if ever, agrees with the expected high correlation as predicted by theoretical considerations.

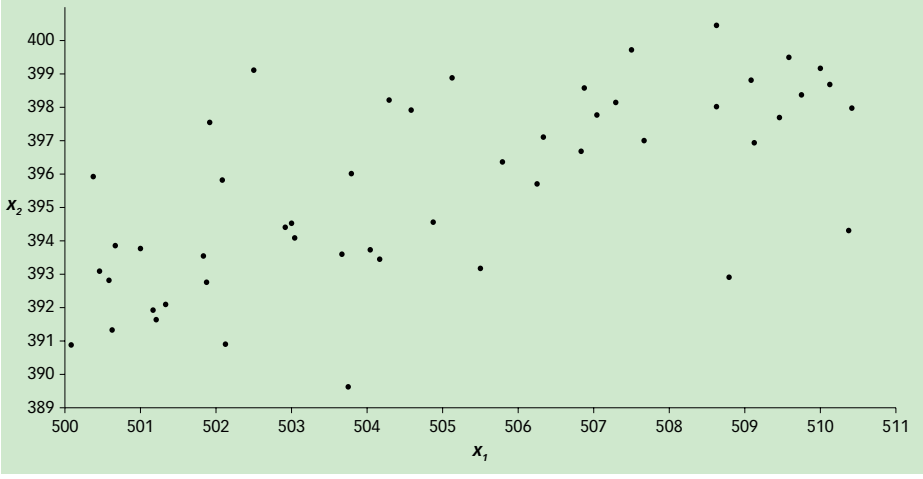
The workers in the control room respond to his question by noting the correlation between the two variables for data taken from a special performance run—in which the processing unit was taken through all levels of operation from the lowest to the highest level—had good agreement with the suggested theoretical value.

Further complicating matters was the fact the special performance run was made under the direction of the previous process engineer.

Scatterplot of performance run data / FIGURE 1



Scatterplot of daily run data / FIGURE 2



Studying scatterplots

To understand this result, the new engineer decides to examine a scatterplot of the two variables derived using the performance run data, as shown in Figure 1. As suggested by the theory, the near-perfect linear relationship that exists between the two variables is indicative of a strong correlation between the variables. The value of the correlation coefficient for the data in Figure 1 is very large, with a computed value of 0.99.

Figure 2 is a scatterplot of the same two variables for data taken from a typical daily run. Note that the data in the plot correspond to the group of points located in the box in the upper right-hand corner of Figure 1. Observe the lack of a strong linear relationship between the two process variables. The computed correlation for these data is 0.66. This moderate value is considerably less than the one determined from the data of the performance run. Examination of the data from other daily runs yielded similar results.

From questioning the control room staff, the process engineer soon discovers that the implemented statistical control procedure for the process was based on monitoring the residual errors of a regression model between the two variables.[1]

The residual error is a measure of how well the regression model predicts. A small error value indicates good prediction. For example, the value of x_1 should be relative to the value of x_2. In contrast, a large error value indicates that the prediction is poor, which implies something has fouled the linear relationship between x_1 and x_2.

> Not only is this necessary to **obtain valid estimates** of the parameters, but it is also necessary to **reduce the number of false signals.**

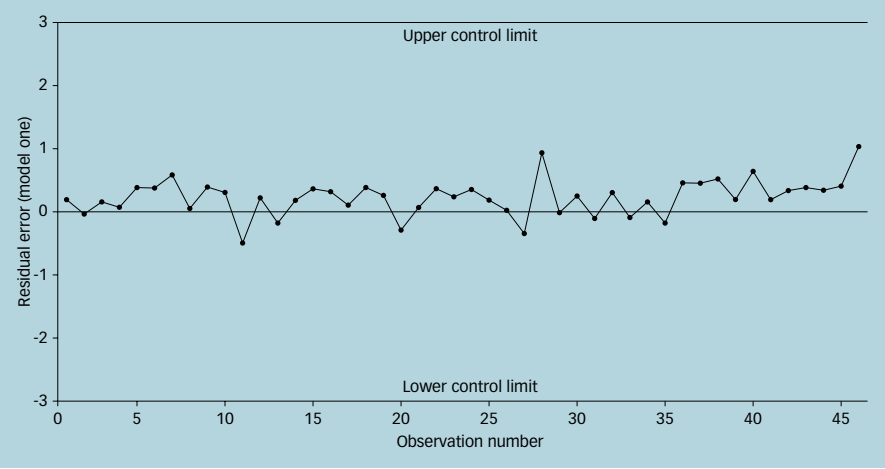
The logic behind such a control procedure is that, under the assumption nothing has changed in the process, you should be able to use the existing linear relationship between the two variables to predict one from the other.

Given the high correlation between x_1 and x_2 observed in Figure 1, you might choose to predict the value of x_1 from x_2 using the regression equation given by $x_1 = b_0 + b_1x_2$, in which the regression coefficients (b_0, b_1) are estimated from the performance data.

If the value of x_1 for a given observation is where it should be relative to the value of x_2, there should be little difference (for example, residual error) between the actual value of x_1 and the predicted value of x_1.

A control chart for the standardized residual errors from the regression model (labeled model one) based on the relationship between the two variables in Figure 1 is constructed. This is shown in Figure 3. The upper control limit (UCL) and lower control limit (LCL) in the chart are placed at +3 and –3, respectively. All points associated with the performance run data are well within these control limits and indicate the previous relationship between x_1 and x_2 is being maintained.

Residual error plot for model one / FIGURE 3



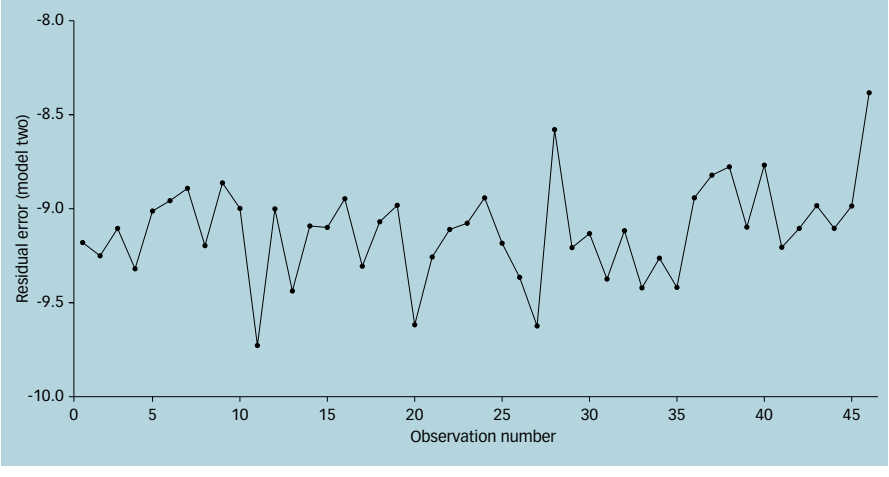
Using the data from the daily runs presented in Figure 2, a second regression model (labeled model two) is obtained for predicting x_1 from the current value of x_2. This is shown in Figure 4. A plot of the standardized residual errors for this model, using the same UCL and LCL as above, is constructed. In this chart, all the observed values in the data are well below the LCL value of –3.

If this model is correct, no observation associated with the daily run data is within statistical control. The new process engineer questions why model two is in error because this is how the unit has operated every day since he has been in his new position.

The explanation

A number of important concepts must be understood before discussing why model two is wrong.

Residual error plot for model two / FIGURE 4



1. Consider the definition of correlation. Correlation between two variables is a measure of the strength of the linear association between the variables. For positive correlation, both variables increase or decrease together. For negative correlation, when one variable increases, the other variable decreases.

2. You must understand how to model the linear relationship between two variables. You can do this theoretically or empirically.

A theoretical approach involves using the design mathematics of the processing unit to model the relationship between the variables. Empirical modeling uses the data obtained from the processing unit to compute a regression equation and the corresponding correlation coefficient.

Sometimes, the former modeling method is referred to as a first-principle approach and the latter as an empirical approach.

3. Discrepancies can occur between the models developed using these two approaches. This is because first-principle relationships seldom take into consideration individual unit differences, whereas empirical models are usually good only for the processing unit on which the data are obtained.

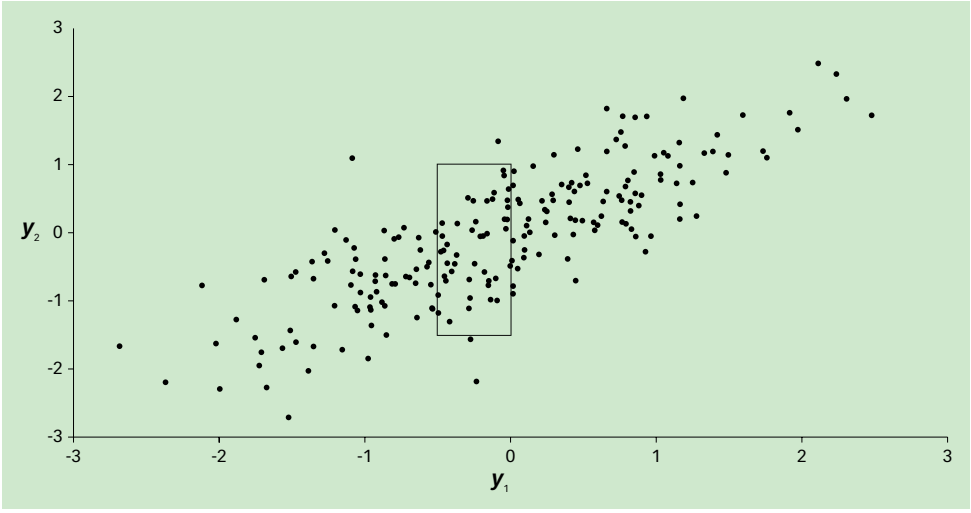
Because there are so many intricate differences between the individual units that can affect performance, the empirical model, as a general rule, is better than the first-principle model because it contains the information pertinent only to that unit.

Then why do you see failure in the situation described earlier? The answer lies in the fact the data obtained in a typical daily run does not provide enough information about the relationship between the two variables. Instead, it provides only a snapshot of what is taking place.

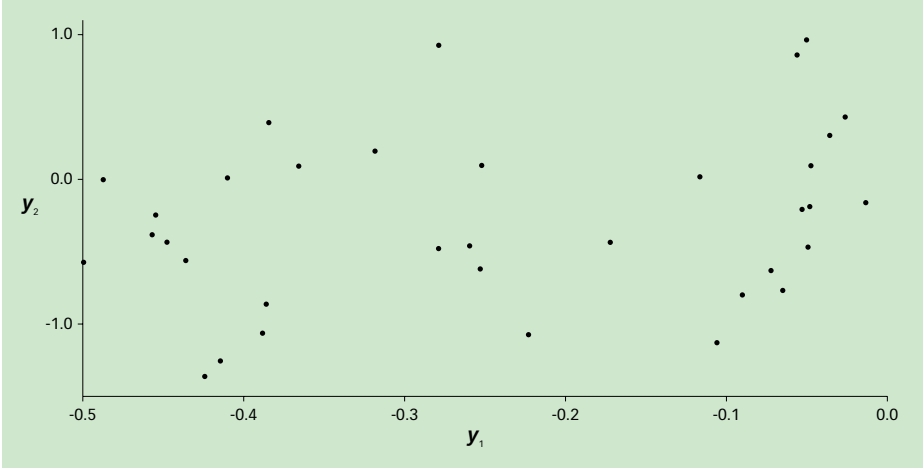
To understand this, consider the scatterplot of the two process variables, y_1 from y_2, in Figure 5. Observe the strong linear relationship between the two variables. The computed correlation has a value of 0.8120.

Now suppose the process operates only for values of the major control variable, y_1, between the values of –0.5 and 0.0. The daily

Scatterplot of two process variables / FIGURE 5



Scatterplot for boxed region / FIGURE 6



HEALTHY RETURN

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The correlation between these two variables, **based on data taken from daily runs, seldom agrees** with the expected high correlation.

run data will be observed as the points within the boxed region given in Figure 5. For easier interpretation, these data are presented in Figure 6. The computed correlation for the daily run for this subset of the data is 0.2657. This implies there is a weak linear relationship between the two variables as opposed to the strong linear relationship noted in Figure 5 when the total data set was used.

Such a phenomenon will occur in many processing units when only a part of the operational region is used in estimating process-variable relationships. In creating a historical data set for a processing unit, the collected data must be taken from all types of run conditions the process may encounter during in-control run conditions. Not only is this necessary to obtain valid estimates of the parameters, such as correlations, but it is also necessary to reduce the number of false signals.

For example, if a particular run condition is not included in the historical data but occurs during process monitoring, the statistical control procedure will interpret it as something different from the baseline and produce a signal.

True correlation

What the new process engineer observed is a common phenomenon in many processing industries. Most processing units are run using advanced process controls and distributed control systems. These are engineering systems that provide tighter process control and reduce variation by keeping the variables within a limited operating region. This leads to improved precision and lower production cost.

In the current problem, the region of daily run data is denoted as the small box in the upper right-hand corner of Figure 1 (p. 70). This region also corresponds to the maximum allowable values of x_1 and x_2, and provides a strong indication the unit is operating at its maximum output (which is the case).

As noted in Figure 2, restricting the range of the variables to stay within this boxed region presents a poor snapshot of how the variables vary together, and thus a poor estimate of the true correlation is obtained.

This problem can be corrected by ensuring estimates of needed parameters are obtained using a historical data set that includes all possible in-control run conditions for the processing unit. QP

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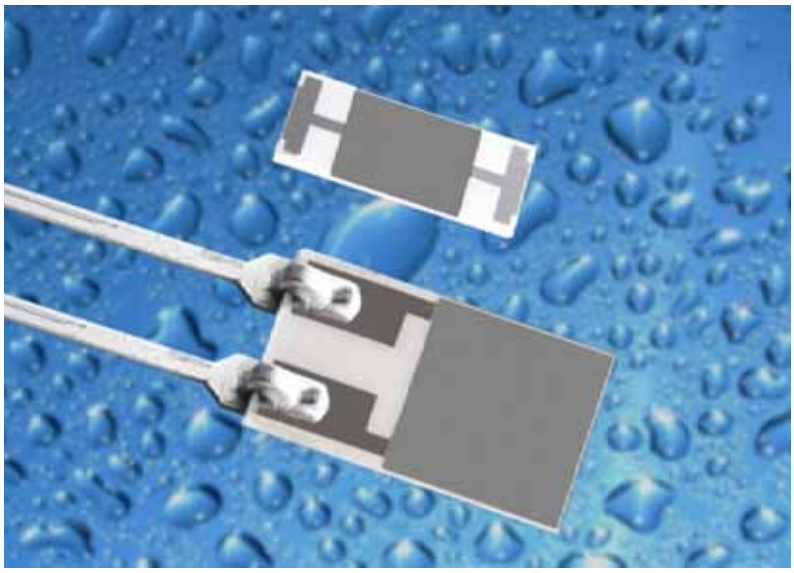

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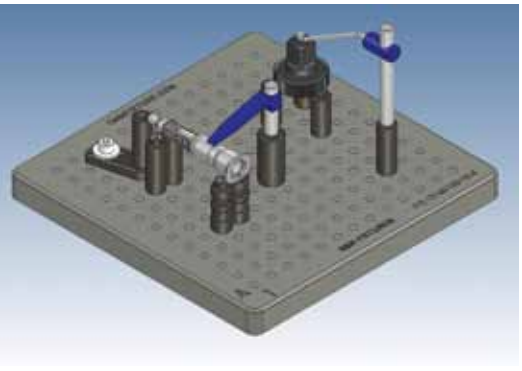
R&R Modular Fixturing has introduced FixtureBuilder 3D computer-aided design (CAD) software for documenting fixture setups and offline parts programming. Users can build a fixture setup from its catalogs of repeatability and reproducibility components and base plates by dragging and snapping into position.



The software automatically builds a list of components and their placement for future reference. Users can also import their part's CAD file into the setup to show the part and the fixture. For those with offline programming capabilities, the whole fixture and part can be exported to create a parts program.

Call: 616-847-6045; visit: www.cmmfixture.com.

Food safety tool

Qualtrax has released Mobiltrax, a tool designed to improve safety and productivity in the food industry. The electronic data-capture software provides a drill-down scorecard for management by exception, deviation routing, paperless audits and the ability to enforce behavior on the plant floor.

Mobiltrax reduces risk and waste while simplifying compliance with USDA, HACCP, FDA, ISO 22000, and Global Food Safety Initiative standards.

Mobiltrax allows management to set specific data collection schedules for key food-safety attributes, such as temperature. Monitors receive tasks in their inboxes when critical control points need to be checked.

Data is captured by using a handheld device that automatically syncs information to the network. Mobiltrax stores information in an electronic scorecard, allowing management to identify deviations from allowable limits quickly and take corrective action immediately.

Call: 540-382-4234 x179; visit: www.qualtrax.com/mobiltrax.

Measurement and control device ▸

Stotz's MSK multifunctional measurement and control device combines pneumatic and tactile touching for in-process and post-process component inspection. The MSK is adaptable to statistical process control software and has the ability to network

Stotz MSL or MSG columns, with output channeled to a single location. This means multiple measuring stations in a plant can be monitored on a single data line.

The standard MSK features a full color 320 x 320 pixel programmable graphic display with a graphics editor, 18 measuring program capability, four LED indicators for rework, connection for external operator box and keyboard, RS232 and USB interface ports, air pressure input with sliding valve and full Ethernet connection.

The optional operating box includes a mode switch for measuring program selection, manual calibration selection and a program start/stop.

Call: 815-297-1805; visit: www.stotz-usa.com.

Combo package

R&M Materials Handling and Drivecon have combined two of their products into a single package. The combination package incorporates the LoadMate Electric Chain Hoist from R&M with the ergonomic PWR-Micro Series radio remote controls from Drivecon.

LoadMate's hoist body is constructed of pressure-cast aluminum, epoxy-painted for corrosion resistance and ribbed for better heat dissipation. The completely enclosed motor includes IP55 protection, minimum class F insulation and a Klixon-type bimetal switch for thermal protection. All models are equipped with a torque-limiting device for hoist overload protection, upper and lower-limit switches, low-voltage controls, a slip clutch and a steel alloy load hook for safe operation.

The ergonomic controls by Drivecon offer better operator control. The PWRMicro Series offers single or dual speed, up to five motions and a control range up to 500 feet. The controls feature an emergency-stop button, removable start key, programmable auto shutdown and an optional antenna extension for a control range up to 1,500 feet.

Call: 513-421-1169; e-mail: skirschner@stimulusworldwide.com.

Sound meter

Casella's CEL-620B wide-range integrating sound meter features real-time octave band frequency analysis from 16 Hz to 16 kHz, along with a full-color LCD that presents overall noise levels in numerical and graphical formats.

The CEL-620B is designed for safety compliance and exposure monitoring. It digitally measures the sound level in factories, refineries, construction sites or other industrial workplaces where noise is a concern.

In addition to assuring compliance to government regulations, it also helps occupational hygienists in identifying and eliminating noise factors. By displaying the previous trends of occurrences, the meter makes it easy to pinpoint significant events in which levels change from a lower background value. A thermometer-style bar graph assists in reading noise parameters during a run.

Call: 603-672-0031; e-mail: bobselwyn@casellausa.com.

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*All online or faxed new member applications must be sent by midnight on April 30, 2009. Applications that are mailed must be postmarked by April 30, 2009.

**TomTom XL 330 maps only include U.S. and Canada. If the winner is a member outside of these areas, they will be rewarded 250 ASQ Bucks in lieu of the GPS.

ASQ

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Month Day Year

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❍ Analyst	❍ Contractor	❍ Inspector	❍ Owner	❍ Six Sigma Green Belt	❍ Technician
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❍ Customer-Supplier (15)
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❍ Lean Enterprise (23)
❍ Measurement Quality (17)
❍ Product Safety and Liability Prevention (25)
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4 Publications

Quality Progress	Domestic	Canadian	International	Price/cost
Full (formerly Regular) Member	included	included**	included**	
Associate Member	$55.00	$90.00	$90.00	❍ $_____
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Air Service Fee	n/a	$30.00	$35.00	❍ $_____
Six Sigma Forum Magazine	$45.00	$65.00#	$70.00	❍ $_____
Journal of Quality Technology	$30.00	$51.00#	$49.00	❍ $_____
Software Quality Professional	$45.00	$65.00#	$70.00	❍ $_____
Quality Management Journal	$50.00	$80.00#	$74.00	❍ $_____
Quality Engineering	$34.75	$51.25#	$51.25	❍ $_____
Technometrics	$30.00	$30.00#	$30.00	❍ $_____
The Journal for Quality and Participation	$45.00	$65.00#	$70.00	❍ $_____

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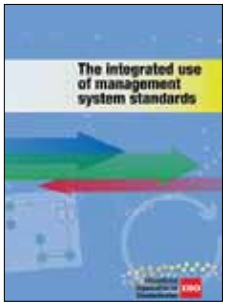
QP REVIEWS

The integrated use of management system standards

International Organization for Standardization, 146 pp., $40 (book and CD-ROM).



With many companies registering to multiple standards, there was a need for a book that provided guidance on how to integrate the requirements of multiple ISO standards with an organization's management system. Who better to fill that need than the ISO technical management board?

This book takes an organization through the process of integrating a typical ISO standard, without giving preference to any one standard. Instead, it aims to help organizations understand and apply an integrated approach in the use of multiple management system standards.

The book contains three chapters that guide the reader through the integration process using a hypothetical business organization helmed by Jim the baker. Jim serves as a one-person village bakery but eventually expands his business to serve a large region before becoming a multinational corporation.

Each chapter contains sections that start with a set of guiding questions followed by an overview of the topic. Using the hypothetical example, there is a feature that explains the methods and tools that need to be applied. This is followed by a section that provides examples from case studies that are included on an accompanying CD-ROM. The case studies are excellent and are drawn from organizations of all sizes, locations and industries.

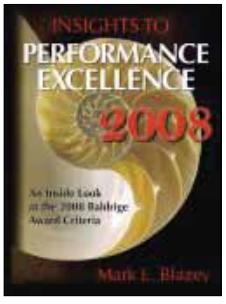
Finally, the practice feature at the end of each section assists readers in applying the principles and methods in their own organizations.

Just like the ISO standards, which do not tell an organization how to implement them, the same is true of this book. But, given the hypothetical example of Jim the baker and the 15 case studies on the CD-ROM, this package would be beneficial to any organization thinking of integrating numerous ISO standards into its management systems.

Reviewed by Wayne Sander
Dove Quality Consulting
Dousman, WI

Insights to Performance Excellence

Mark L. Blazey, ASQ Quality Press, 2008, 360 pp., $84 list, $50 member (book and CD-ROM).



The primary purpose of the latest edition of this series is to help performance-excellence examiners and practitioners understand the Baldrige criteria. Changes to the 2008 edition include updated information about the Baldrige criteria, while new templates and supplements for healthcare and education are included on an accompanying CD-ROM.

Blazey begins with an introduction to performance excellence, explaining the core values, links and lessons he has gleaned during a career that includes five years as a senior examiner for the Baldrige award. The second part of the book breaks down the Baldrige criteria, including specific language, a summary of the requirements, key links and examples of effective practices. The last section deals with tips on preparing the application and clarifies the Baldrige scoring requirements, as well as other issues.

The strength of the book is how it simplifies the Baldrige criteria into easily understandable and actionable items through the use of plain language, flowcharts and relationship matrixes. Its main weakness is the unstructured presentation, which creates repetition of information.

While not a book for beginners looking for an overview of the Baldrige criteria, I recommend it for organizations that recognize the Baldrige criteria as a way to ensure performance excellence. Further, it should be compulsory reading for large organizations that want to apply for the award.

Reviewed by Martín Tanco
University of Navarra
San Sebastian, Spain

The Role of Statistics in Business and Industry

Gerald J. Hahn and Necip Doganaksoy, Wiley & Sons Inc., 2008, 343 pp., $79.95 (book).

This book is a cross between a statistical handbook and a nonstatistical guide—an unusual approach, because it is difficult to do a good job communicating information to technical and nontechnical audiences at the same time. In this case, however, the authors manage to accomplish the feat.

The introductory chapters review some basic statistical information, discuss the role of quality in statistical analyses and touch on many of the applications that are central to the use of statistics in business. These chap-

ters convey the importance of understanding data and should be required reading for quality managers and statistical personnel.

Most of the book covers applications of statistics (and, by extension, quality control and assurance) to manufacturing, production and product design. At that point, the book becomes quite a bit more technical—but not more mathematical—and is aimed at the statistician while not excluding non-statistical technical researchers and managers. Numerous examples are provided, and the reader is encouraged to visit the book's file transfer protocol (FTP) site to examine the data and analyses more fully.

The final section of the book includes chapters about applications outside the manufacturing realm, including pharmaceuticals, finance and business services. These are written by guest authors in these fields and, while interesting, are not up to the level of those written by Hahn and Doganaksoy.

With its emphasis on real-world problems and applications, this is a good handbook for all statisticians in the manufacturing field. It also could be used in graduate or industrial training classes.

Reviewed by I. Elaine Allen
Babson College
Wellesley, MA

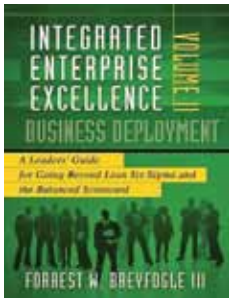
The Integrated Enterprise Excellence System, Vol. II

Forrest W. Breyfogle III, Bridgeway Books, 2008, 524 pp. $54.95 (book).

Labeled as the second volume, this is actually the third in Breyfogle's set of books introducing his integrated enterprise excellence (IEE) system. It is intended for managers and Master Black Belts who are implementing or may want to implement an enterprise-level continuous improvement program.

The book starts by describing the strengths and weaknesses of Six Sigma, lean, *Hoshin Kanri* and the balanced scorecard system, with an emphasis on how metrics are reported. Breyfogle then provides an overview of IEE and describes how successful leaders and business improvement teams can be developed.

The remainder of the book covers how the design, measure, analyze, improve and control process can be used at the enterprise level, with chapters covering each phase.



The book shows how metrics reported in tables or color-coded charts can lead to behaviors that run counter to management desires. Breyfogle argues this is because most metric-reporting systems look at static snapshots of business performance rather than analyzing performance trends and whether the business processes are running in a predictable manner. He suggests reporting metrics using control charts and probability plots to analyze process performance.

Given the importance of metrics in the system, the book could have done more to show what a good metric is and how to develop successful metrics. More information on the best practices for communicating information graphically also would have been useful. But, overall, the book is worthwhile reading for someone looking to implement an enterprise-level continuous improvement program.

Reviewed by Brian Cocolicchio
New City, NY

RECENT RELEASES

ISO 9001:2008 Internal Audits Made Easy

Ann W. Philips, ASQ Quality Press, 2009, 176 pp., $40 list, $24 member (book).

Lean Six Sigma for the Office

James William Martin, CRC Press, 2009, 339 pp., $49.95 (book).

Transformative Quality

Mark Hagland, CRC Press, 168 pp., $49.95 (book).

QP CALENDAR

For more information or to register for ASQ Education Courses, contact Learning Offerings, ASQ, 600 N. Plankinton Ave., Milwaukee, WI 53203, call 800-248-1946 or 414-272-8575, fax 414-272-1734 or visit www.asq.org.

MAY

1 ASQ Conference. **Lowcountry Section Conference.** North Charleston, SC. Call Guy Gimson at 843-768-2549 or e-mail chairelect@asq1122.org.

4-5 ASQ Education Course. **Measuring Process and Organizational Performance.** Oakland, CA.

4-8 ASQ Education Course. **Introduction to Quality Engineering.** Oakland, CA.

4-8 ASQ Education Course. **Reliability Engineering.** Oakland, CA.

4-8 ASQ Education Course. **ISO 9001: 2008 Lead Auditor Training.** Oakland, CA.

5-6 ASQ Education Course. **Measuring Process and Organizational Performance—Virtual Course.**

6 ASQ Education Course. **Risk Management for Medical Device—Virtual Course.**

6-7 **Product Safety and Product Liability Prevention Seminar.** Irvine, CA. Visit http://randallgoodden.com or e-mail Randall Goodden at info@randallgoodden.com.

6-8 ASQ Education Course. **ISO 9001: 2008 Internal Auditor Training.** Oakland, CA.

7-8 ASQ Education Course. **Failure Mode and Effects Analysis—Design and Process.** Oakland, CA.

7-8 ASQ Education Course. **Customer-Supplier Partnerships—An Introduction.** Oakland, CA.

7-8 ASQ Education Course. **Using Control Charts to Interpret Healthcare Data.** Oakland, CA.

11-15 **14th Annual Knowledge Management Conference and Training.** Houston. Call the American Productivity and Quality Center at 800-776-9676 or visit www.apqc.org.

12 ASQ Education Course. **The Case for Quality: Taking It to Management—Virtual Course.**

12-14 **Green Six Sigma Conference.** Chicago. Call Worldwide Conventions and Business Forums at 312-466-5774 or visit www.wcbf.com.

12-14 **Leadership Through Quality: Strategy and Execution, module 2.** Minneapolis. Call the Carlson School of Management at 800-388-3863 or visit www.carlsonschool.umn.edu.

14 ASQ Education Course. **Quality Cost Principles—Virtual Course.**

17-22 **STLE Annual Meeting and Exhibition.** Orlando, FL. Call the Society of Tribologists and Lubrication Engineers at 847-825-5536 or visit www.stle.org.

18-20 ASQ Conference. **Quality Institute for Healthcare.** Minneapolis.

18-20 ASQ Conference. **Institute for Software Excellence.** Minneapolis. Contact Carol Dekkers at 727-393-6048 or e-mail dekkers@qualityplustech.com.

18-21 ASQ Conference. **World Conference on Quality and Improvement.** Minneapolis.

19-21 **Software Tester Certification—Foundation Level.** Seattle. Call Software Quality Engineering Training at 904-278-0524 or e-mail sqeinfo@sqe.com.

20 ASQ Conference. **Quality in Sustainability.** Minneapolis.

20-22 ASQ Education Course. **Certified Calibration Technician Refresher Training.** Minneapolis.

20-22 ASQ Education Course. **Implementing and Auditing an ISO 9001:2000 System.** Minneapolis.

20-22 ASQ Education Course. **Implementing Statistical Process Control.** Minneapolis.

21-22 ASQ Education Course. **Excellence in Eight Dimensions.** Minneapolis.

22 ASQ Education Course. **Lean *Kaizen*: A Simplified Approach to Process Improvements.** Minneapolis.

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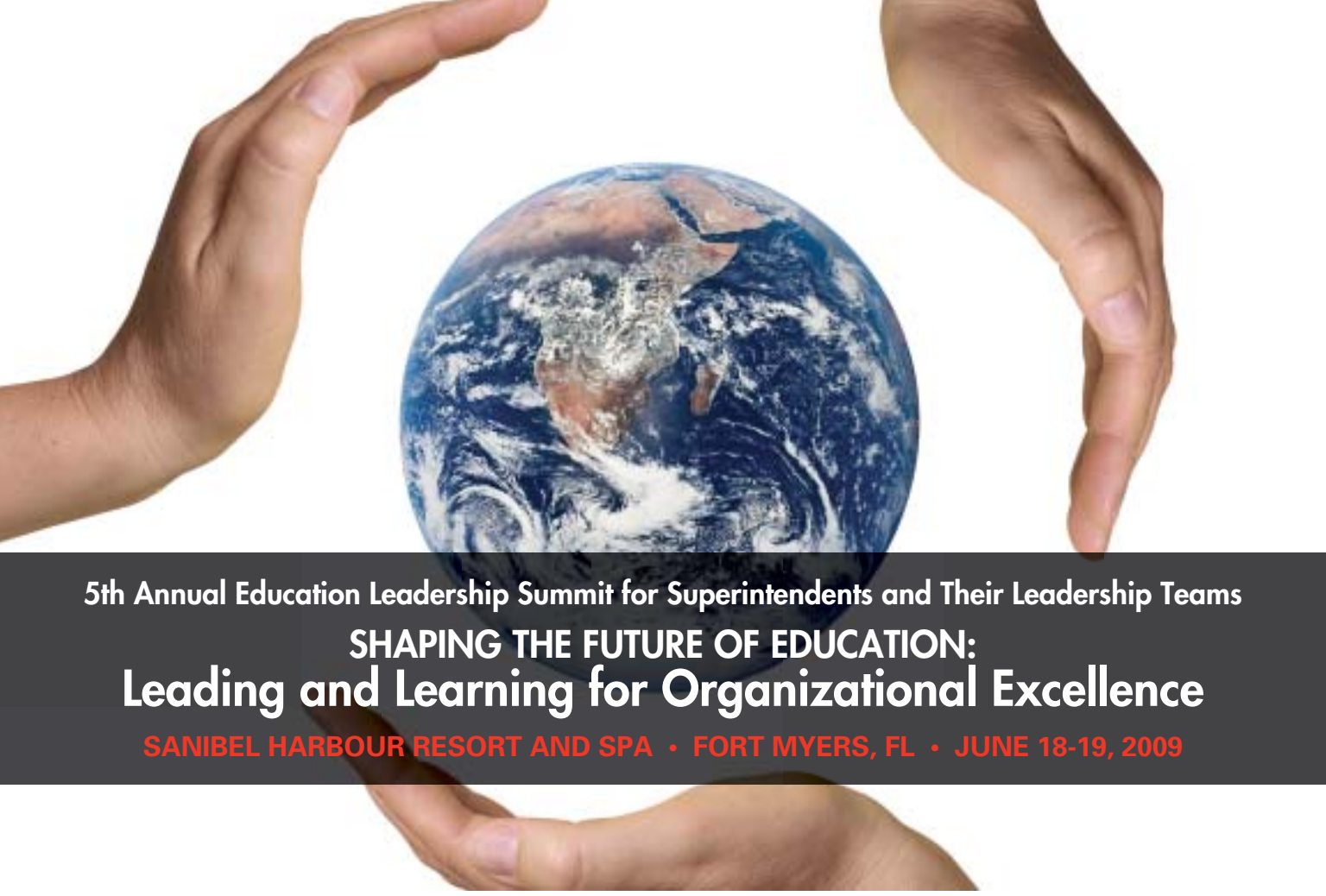
If you'd like your event included in QP Calendar, submit information at least three months in advance to bkrzykowski@asq.org. Non-ASQ organizations may list one event per issue.



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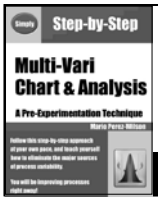

Beyond Sensors and Scopes

Use lean tools to see the solution that's right in front of you

TECHNICIANS WORKING in a testing lab at Solutia Inc.'s facility in Pensacola, FL, had access to some of the most powerful microscopes and analytical technology available. But they still couldn't see the solution to a problem that had challenged them for years.

One of the tests performed in the lab required that samples be kept in a freezer for a specified period of time and then tested while they were still cold. Unfortunately, the freezer was at one end of the room, and the testing apparatus was at the other. The reason? Years before, the test was added to the work being performed in the lab, and the freezer was put in the only open space large enough to hold it.

The technicians simply couldn't cross the room with the samples and keep them cold enough to comply with the standard. They tried several tactics, from transporting the samples in ice chests to snatching the samples from the freezer and sprinting across the room—right across the paths of other researchers working on other projects.

I encountered this problem as part of my work as a quality engineer at Solutia, a worldwide specialty chemicals and engineering plastics company. Headquartered in St. Louis, Solutia employs 5,700 people around the world at more than 60 sites, including the one in Pensacola.

As part of an effort to improve efficiency, we wanted to consolidate two similar labs. But we didn't want to pick up the lab and set it down as it had always been, so I was assigned to help the technicians examine the lab's layout and their procedures to ensure we had a lean, efficient workflow prior to relocation.

In an improvement project such as this, my role is not to walk in to someone's lab and dictate solutions. Instead, I try to stimulate people to think about their work in new ways. Helping them see the waste for themselves leads them to their own solutions. And people are more likely to embrace change if it is their own idea.

When I began work with the technicians, I led discussions using lean tools, which we had begun using as part of a divisionwide initiative in 2003. We conducted a paper *kaizen* before any equipment was moved or a location was selected. The goal was to design the ideal lab on paper first and then make that idea reality. We followed four simple steps:

1. **Create a process/equipment matrix:** This defines what work will occur in the lab, highlights duplicate or rarely used equipment and overlapping of tasks with other groups and reveals groupings that will help the team make decisions on the layout of the lab.
2. **Identify equipment dimensions and special needs.**
3. **Create the ideal layout:** Use the work cell concept to minimize walking or motion and draw spaghetti diagrams to visualize the workflow.
4. **Identify and rank potential locations:** For each new location, determine compromises from the ideal layout and consider separating groupings of tasks.

I also asked them: "If there were no limits on money or space, if this was your lab and you could do anything, what would you do?" It can be difficult for people to embrace that mode of thinking, because of their desire to minimize costs. In the same way, people can have trouble looking objectively at their work setup. They're used to where everything is, even if things are not in the best places.

The lean tools quickly revealed to the techs how inefficient their processes had been. When they started drawing spaghetti diagrams, their feet started to hurt because they realized for the first time how much extra walking they had to do every day.

When we got to the question of how to get products from the freezer to the testing apparatus without letting them get warm, the light finally came on: Why not move the freezer? The technicians started laughing. "We've been struggling with this for years," one said. "It never occurred to us to move the freezer!"

The benefits of our lean exercises went beyond efficient freezer placement. The technicians saw value in the process and began applying this thinking to other areas of the lab. They also spoke highly of the process with their peers and supervisors. That made it easier for me to go to other labs and do the same thing.

As a result, I was motivated to do even more, because as the lab technicians discovered, sometimes quality can help you see things sensors and scopes can't. QP

ANNIE DODSON is a quality engineer with Solutia Inc. in Pensacola, FL. She earned a master's degree in mathematics and statistics from the University of West Florida in Pensacola. Dodson is a member of ASQ and an ASQ-certified Six Sigma Black Belt.

STEP BACK

Have you ever struggled with a problem until a simple process led you to the solution? Share your story by e-mailing editor@asq.org.

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