



## QUALITY MANAGEMENT

# Multiple Choice

## What's the best quality system?

**H**ow would you answer this question? How would your colleagues? After *Quality Progress'* issue on Six Sigma was published in January, our online discussion board started getting lots of messages, some complaining about Six Sigma hype or the lack of negative coverage of it.

*QP's* editor, Debbie Phillips-Donaldson, challenged several of the message writers to send her something we could publish—an article or letter to the editor. One, quality assurance engineer Steve Prevette, said he would like to write about the system he likes best—Deming or systems thinking—and suggested we get others to write about their favorite methodologies.

At about the same time, Sharron Manassa, one of the librarians in ASQ's Quality Information Center, told us she had received about 30 requests during January along the lines of: "Help. My company has just charged me with starting a quality program. Where do I start?"

Prevette's idea was starting to look more and more like a way to meet several customer needs. Phillips-Donaldson and other *QP* editorial staff members contacted several quality practitioners, concentrating on those actually out in the trenches, using quality tools and methods on a daily basis. The following seven articles are certainly not exhaustive but include discussion of most popular methodologies available. The methods run the gamut from what could be considered basic (ISO 9000) to the more complex (Baldrige). Some advo-

- ISO 9000.
- Quality Operating System.
- Lean.
- Six Sigma.
- A combination of lean and Six Sigma.
- Deming/systems thinking.
- Complexity theory.
- Baldrige.
- All of the above.
- Something different.

cate a single methodology, others a combination of two or more.

It becomes obvious there is no one correct answer to the multiple-choice question that started this article. The key is to use the methodology or combination that makes the most sense—and works—for your organization.

If your favorite quality methodology isn't included, send a short article or even shorter letter to the editor telling us about it. Our readers, particularly those new to quality or charged with starting a quality program from scratch, are eager to hear what you have to say. Please write to [editor@asq.org](mailto:editor@asq.org).

ISO 9001:2000  
 Ford's QOS  
 Lean Plate With Six Sigma Special  
 Systems Thinking

# ISO 9000 Makes Integrated Systems User Friendly

by **David Shipley**

The revised ISO 9000:2000 standard makes several provisions for organizations either to develop and implement a new quality management system or change and improve an existing one.

Organizations need to develop and implement management systems based on processes or activities that systematically help personnel understand what is essential to consistently achieve continual improvement. But it is evident managers and quality practitioners are not taking advantage of the change a user friendly standard such as ISO 9000 has the capacity to create.

When different management systems—health and safety (as in BSI 18000), environmental (ISO 14000) or quality (ISO 9000)—are analyzed from a generic perspective, similarities become apparent. All management systems consist of five rudimentary components: infrastructure (environment), system/operation, input, process and output (see Figure 1). The components are interrelated and influence the implementation, integration and improvement of the system.

## Implementation

The 19th century Russian scientist and mathematician Pafnuty Chebyshev said a failure to plan is a plan to fail. Several factors influence the suc-

cessful implementation or revision of a management system.

Before implementation, it is critical an in-depth analysis of the business or organization be conducted to accurately define the products and services being provided. Performance and gap analysis of the existing system will also provide insights on organizational hierarchy and the influence structure has on the processes and activities of the business.

Corporate or organizational culture and management styles can affect final output. Too often progress is hindered when the sentiment of management or leadership is, "No one is going to tell me how to run (or is that ruin?) my business."

From the perspective of a management system user, ISO 9000 standards provide a foundation for businesses and organizations to achieve sustainable improvement by acknowledging the value of personal input. Encouraging employees at all levels and functions to participate in the implementation or transitional phase of development and documentation of the system accelerates the ownership of activities and personal accountability throughout the implementation process.

## Integration

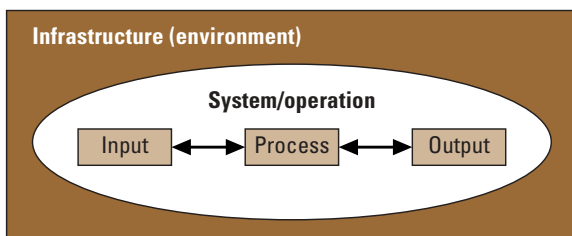
So, just exactly what is an organization trying to accomplish through the documentation and integration of management systems?

Samuel Johnson, the 18th century English writer and lexicographer, said, "The next best thing to knowing something is knowing where to find it." This quote has relevancy to management systems. But a review of management system documentation sometimes leaves an impression that individuals must have competency in hieroglyphics to understand it.

Although audit evidence may indicate a quality, environmental or health and safety system is conformant to a specified standard, management and employees have a tendency to dissociate themselves from system ownership and responsibility by uttering that ever so familiar statement of "No one is going to tell me what to do! Besides, it is the system coordinator's job to take care of all of that ISO 9000 stuff."

Plainly and simply put, the solution is

**FIGURE 1** Management System Components





not to obfuscate (to make so confused or opaque as to be difficult to perceive or understand<sup>1</sup>) the system. If a cooperative decision is made to integrate the various management systems, all the information having a direct effect on employees in a managed activities or process system needs to be readily available, relevant and understood—a requirement of the ISO 9000 standards.

System ownership is cultivated throughout all levels of a business when it is the responsibility of employees to define the processes and activities various systems are comprised of.

Those selected or who volunteer to assist in the integration of procedures may find it constructive to prioritize or rank the importance of procedures relative to overall system effectiveness and then record progress based on review and completion or approval of the documentation. Common or similar management system procedures that may be integrated are shown in Table 1.

## Improvement

Quality professionals can certainly relate to the familiar “pledge” of the Metro Para aviators: “We, the unwilling, led by the unknowing, are doing the impossible for the ungrateful. We have done so much for so long, with so little, we are now qualified to do anything with nothing.”

System implementation and integration have a direct effect on improvement. But the differences in agendas and objectives of employees and management are common deterrents to achieving continual improvement. Unless everyone is reading from the same page or following the same instructions, it is difficult to attain process consistency and system improvement.

Systematic improvement is facilitated by ISO 9000, which places an emphasis on planning and measurement, customer focus and process ownership, responsibility and accountability—with

**TABLE 1** Integrated Quality and Health and Safety Management System Procedures

Procedure (general)	Priority	Reviewed	Completed
Record control			
Document control			
Internal audits			
Management review			
Corrective action			
Preventive action			
Monitoring and measurement of process			
Instrument calibration			
Data backup			

Procedure (management)	Priority	Reviewed	Completed
Management of change			
Training (per regulations and standards)			
Resources (work environment and infrastructure)			
Analysis of data			
Internal and external communications and promoting stakeholder requirements (including stakeholder complaints)			
Establishing policies and objectives			
Goal setting			
Developing business strategy and annual operating plan			
Management system structure			
Assignment of responsibility and authority			
Management system performance			
Assessing need for continual improvement			
Identification of stakeholder requirements			
Purchasing			

everyone in agreement on what needs to be accomplished:

**Planned and measured improvement.** Resilient change is the capability of adapting to or recovering from differing circumstances. Planning and measurement are critical to keep anticipated change from being perceived as preventive planning. Monitoring and recording the extent of transition experienced within a designated area assure

change will be resilient. Planning and measurement are integral to ISO 9000.

**Improved customer focus.** There is a tendency to confuse customer wants and needs with customer expectations and specifications. Developing a concise definition and statement of external and internal customer expectations and specifications, as required by ISO 9000, contributes to clarifying what the customer focus of a business consists of. Processes or activities are consistently utilized to assure external and internal customers receive the product or service required.

Once the organization determines the internal and external customer requirements and how specifications are to be met, fostering and maintaining open communications are critical to continual improvement of the management system.

**Improved process ownership, responsibility and accountability.** Further improvements are actualized when an ISO 9000 environment is created in which employees are aware they are responsible and accountable for the various business processes and activities. This approach encourages ownership of the management system.

The ACID test is a decisive tool to partially assess development and improvement of a management system. Never heard of it? It is important to do the following during integration and maintenance of a management system:

- **A**void duplication of system documentation and efforts.
- Have **c**ohesive systems that are logical and easily comprehended by system users.
- Make sure **i**ntegrated system differences are transparent or seamless to the user.
- Have **d**ynamic systems characterized by activity, progress and transition.

### Is ISO 9000 for WIMPS?

Fail? Maintain? Succeed? When given the options, most businesses and industries strive for success. The approach I've described here, called worthwhile improvements made practical systematically (WIMPS), produces tangible and measurable management system results. Possibly ISO 9000 is for WIMPS after all.

#### REFERENCE

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## QOS—A Simple Method for Big Or Small

by **Carl W. Keller**

I have been involved in several types and aspects of quality management over the last 15 years and have seen just about every kind of quality management system (QMS). There are many quality initiatives floating around, and a lot of hype surrounds some of them. Some initiatives border on being fads and gimmicks, while some have a bit more impact.

So, which one would I choose if I had free rein and wanted to get the most for my money? The biggest bang for the buck I have had the pleasure of implementing is Ford Motor Co.'s quality operating system (QOS). QOS was developed by Ford in 1986 and was added as a requirement of its Q1 supplier registration in 1988.

While Ford suppliers are subject to a QOS assessment, which involves several criteria including communication, teamwork, measurables and continuous improvement, QOS is just as easily adapted to an organization that is not an automotive supplier and not subject to QOS, Q1 or QS-9000 or TS 16949 (the automotive derivatives of the ISO 9000 quality management standard). In fact, outside Ford, the QOS initiative is known as a business operating system (BOS).

The QOS/BOS operating philosophy includes a structured team approach, use of standard tools for data collection, a structured reporting format and a closed loop continuous improvement cycle. Keen observers will notice its striking similarity to the 14



principles of W. Edwards Deming (see “Deming’s 14 Principles,” p. 30).

Why do I like the QOS/BOS methodology? It’s because of its simplicity. While it is an initiative based on team effort, you don’t need to be a huge company with a staff of 10 statisticians to implement and use it. The coffee shop down the street can get a return from it just as easily as a large manufacturing plant can.

Anyone can track average delivery time, parts per million defective or percentage of returns from customers. Forming a team to track and improve customer satisfaction in these or other important areas is neither overly time consuming nor cost prohibitive.

### **Customer Satisfaction Focus**

ISO 9001 requires a hefty investment to prove evidence of continuous improvement, and some people are paying \$70 grand or more for a Six Sigma belt, but QOS/BOS has provided a QMS in a basic, no-frills format that can be understood by all.

Therein lies its power. Everyone can understand it, and all employees are therefore more apt to actually use it. There is no need for wild claims of return on investment or fudging of document revisions every six months because the ISO 9001 registrar is due. There are also no martial arts—just basic customer satisfaction as the focus.

The concept is simple. It goes something like this:

1. Identify customer expectations.
2. Identify the key processes that affect these expectations.
3. Select your measurables based on what is critical to the customers.
4. Track the trends of the measurables.
5. Predict the downstream performance.

These tasks are all positioned on a closed loop, continuous improvement wheel. The hub of the wheel—constant employee awareness—is probably the most critical part. If there is one single failure of top management that causes organizations not to reap the benefits of any QMS, it has to be a consistent lack of awareness of the importance of meeting customer expectations.

QOS/BOS expects awareness will be elevated at all levels within the company. While it is suggested the team chairperson should be a member of management, the champions of each measurable

should include employees from throughout the organization. This leads to credibility throughout the various levels.

The year 2000 revision of ISO 9001 makes an attempt at this credibility by requiring quality objectives to be established, but it usually falls short of full employee awareness of the complete process and does not require input from all levels.

Regardless of the type of product or service, the size of the company or the management structure, several key customer expectations are common. Customers want the highest quality product, at the lowest cost, delivered on time.

### **Key Processes**

After establishing the customer expectations, QOS calls for key processes to be determined. These are the processes most likely to affect the customer expectations either positively or negatively.

The processes will need to have values attached for purposes of measurement. The critical values become the measurables. Measurables can be process or result focused, but you should avoid picking too many measurables. If too many are chosen, there will be a tendency to focus less on the more important ones, emphasizing the measurables with which people are most comfortable.

Each metric is tracked over time (usually monthly) and displayed in some fashion that allows all employees to see how they are doing—good or bad. When negative trends are experienced, employees analyze why the trend occurred and what the downstream performance impact will be in the future. Tools used during the process include trend charts for each measurable, Pareto or pie charts, and data over time tools, such as a Paynter chart.

### **Employee Involvement**

Unlike what happens with many other initiatives, if you hang up basic charts showing a baseline and monthly progress, employees actually will take it upon themselves to see how they are doing. You may be surprised at the level of involvement and the ingenuity employees use to correct negative trends or keep positive trends going. The key is to improve processes, customer satisfaction and, ultimately, business results.

Do the other QMS methodologies have merit? Sure they do, but let’s face it—many companies are

just not going to use them. As much as we want upper management to show enthusiasm for quality programs, executives often fall short of giving those programs full support.

Upper management may send employees to Six

Sigma High or hang an ISO 9001 certificate in the lobby, but only a few will ever use the initiatives for anything more than marketing tools. All too often, flowery mission statements and quality manuals continue to gather dust because initiatives

# Deming's 14 Principles

1. Create constancy of purpose toward improvement of product and service, with the aim of becoming competitive, staying in business and providing jobs.
2. Adopt a philosophy that does not tolerate lack of quality, defects, antiquated training methods, and inadequate and ineffective supervision.
3. Cease dependence on inspection to achieve quality.
4. End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item based on a long-term relationship of loyalty and trust.
5. Improve constantly and forever the system of production and service to improve quality and productivity and thus constantly decrease costs.
6. Institute training on the job.
7. Institute leadership that aims to help people and machines do a better job.
8. Drive out fear so everyone can work effectively for the company.
9. Break down barriers between departments.
10. Eliminate slogans, exhortations and targets that ask the workforce for zero defects and new levels of productivity. Such exhortations only create adversarial relationships because the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the workforce.
11. Eliminate quotas on the factory floor. Substitute leadership.
12. Remove barriers that rob hourly workers, engineers and people in management of their right to pride of workmanship. This means abolishment of annual merit ratings and management by objective. The responsibility of supervisors must be changed from sheer numbers to quality.
13. Institute a vigorous program of education and self-improvement.
14. Put everyone in the company to work to accomplish the transformation.

Source: The preceding was adapted from W. Edward's Deming's classic *Out of the Crisis*, originally published by Massachusetts Institute of Technology in 1982. A new paperback edition was published by MIT Press in 2000.

are not communicated on an ongoing basis. They are eventually perceived as lip service or the flavor of the day.

I've presented a very basic overview of QOS/BOS methodology here, and I do not claim to be a QOS/BOS expert by any means. Several companies specialize in QOS/BOS training and assessment, and Ford Q1 suppliers use the concept more comprehensively as part of their systems. The basic tenets of all these initiatives—with continual process improvement the key—have been the same since QOS/BOS methodology started.

QOS/BOS methodology offers an easily understood, yet very effective, continuous improvement tool that promotes employee involvement on an ongoing basis. I received a copy of the *Quality Operating System Primer*<sup>1</sup> several years ago and have used it as a basis for my QMS ever since.

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1. Eric Gall and Sylvia Kaput, *Quality Operating System Primer*, Ford Motor Co., 1996.

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## Lean and Six Sigma—Synergy Made in Heaven

by **James Bossert**

A rope hangs down from the assembly line. A worker can pull it if there is a quality problem he cannot fix quickly. A tug on the rope causes music to play and lights up a number on a board, showing managers where a worker needs help.<sup>1</sup>

This is a good example of how the combination of Six Sigma and lean enterprise work to enhance the production experience. The worker has the empow-

erment and skills to recognize a problem when it occurs and, if it cannot be resolved, to shut down the line to eliminate the root cause. The display showing the location of the problem allows people to be quickly brought in to help get the line back up.

In my experience, I have found Six Sigma and lean enterprise methodologies to be synergistic even though they evolved from separate paths. Lean enterprise was developed by Toyoda (generally known as Toyota) as an extension of the Ford manufacturing system. Toyoda took what it learned from Ford and advanced the concepts to a broader level, one that helped the Japanese automaker improve productivity and profitability.

Lean enterprise is mainly focused on eliminating waste. In manufacturing, lean principles include zero waiting time, pull instead of push scheduling, smaller batch sizes, line balancing and shorter process times. Value is specified in the eyes of the customer, employees are empowered, and perfection is pursued through continual improvement.

Six Sigma is primarily a methodology for improving the capability of business processes by using statistical methods to identify and decrease or eliminate process variation. Its goal is defect reduction and improvements in profits, employee morale and product quality.

Six Sigma, as developed by Motorola, was an extension of many existing quality tools and techniques, but with the addition of financial accountability. This resulted in process improvement gains at Motorola that increased productivity and profitability.

Different approaches, similar results.

### Merging the Two Approaches

It was inevitable people would start to merge the approaches. Sometimes, depending on the circumstances, the results were complementary. This tended to happen when the Champion (the business leader or senior manager who ensures resources are available for Six Sigma projects, reviews results and deals with organizational issues) and the Six Sigma team worked to find the best combination of techniques to create a robust solution. This approach was used successfully at GE Capital time and time again.

Today we see a consolidation of lean enterprise and Six Sigma methods as a differentiator for

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many consulting firms. The ones who combine the two tend to get more business. This has not always been the case.

Some companies took narrower approaches, treating each methodology as different and unique. This approach tended to create other problems, particularly related to the amount of time needed to resolve problems. Process teams were pulled in different directions, and those with limited resources were forced to choose one or the other approach.

The end result was the business and customer suffered. The business did not obtain sustained gains in productivity. The customer, who really did not care what methodology was being used, did not see improved product.

So, people began to dislike lean enterprise and Six Sigma, thinking both wasted time, took too long to implement and ultimately didn't result in satisfied customers.

But they definitely can work—and very effectively. Honeywell, for example, combined lean and Six Sigma into something called Six Sigma Plus to drive productivity, growth and cash flow.<sup>2</sup> In one case, a Master Black Belt (a Six Sigma or quality expert responsible for strategic implementations) and his team turned profit margin from -\$0.9 million a year to +\$3.4 million a year by reducing variation, cycle times and product travel distance.

### Personal Preference

Some believe lean enterprise methodologies must be completed before Six Sigma gains can be maximized. I, however, think it really does not matter which approach is used first—rather the approach should be based on the personal preference of the Six Sigma Black Belt (BB) who is leading the team. BBs have full-time responsibility for individual Six Sigma process improvement projects.

All Six Sigma projects include measurement review by the team and its Champion. Next steps are usually discussed at this time. If it is determined some quick hits can be obtained using lean enterprise techniques, then the techniques are implemented. Because the team and process owners can focus on discovering the root causes of the problem being addressed, there is usually some immediate buy-in by the team and process owners. Then when the root cause is eliminated, the lean enterprise techniques are used in conjunction with

statistical process control to maximize the benefits.

I have found this timetable particularly successful in nonmanufacturing situations—surprising to some because lean enterprise is traditionally seen as manufacturing oriented. This latter perception is based on lean's manufacturing roots.

But in reality, nonmanufacturing companies are finding many manufacturing tools and techniques, including lean enterprise and Six Sigma, to be effective.<sup>3</sup> The combination approach creates an overarching philosophy of improvement. It is how a BB utilizes all the available tools that will dictate success.

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2. William J. Hill and Willie Kearney, "The Honeywell Experience," *Six Sigma Forum Magazine*, February 2003, p. 34.
3. Bank of America, "Final Thoughts," *Six Sigma Forum Magazine*, May 2003, p. 52.

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## Systems Thinking— An Uncommon Answer

by **Steven S. Prevette**

Enron. California energy crisis. SUV rollovers. Tire failures. What do these have in common?

- Focus on the short term. Short-term gains. Focus on the quarterly profit statement.
- Long-term losses. Suboptimized, competing, stove-piped factions.
- And an uncommon solution: systems thinking.

Why do we lament that the whole is less than the sum of the parts? It is because we tend not to work on the whole but only on the parts. Systems



thinkers, instead, focus on the whole, paying attention to the interactions between the parts rather than the parts themselves.

Systems thinking has evolved over the past 100 years to become a significant and successful management approach. W. Edwards Deming was one of the best known systems thinkers, and many continue forward from his work, just as he built upon ideas from his predecessors. Russell Ackoff is probably the best known living proponent, through his provocative writings and lectures.<sup>1</sup>

Systems thinkers approach quality performance as a holistic enterprise. Quality, productivity and profit work together to guarantee the success of the organization. An organization must manage its components. But, more importantly, it must manage the interactions between components to manage a system.

## How To Destroy a System

Ackoff tells us systems may be destroyed by separately improving the performance of one or more of their parts. Deming uses an example of a business traveler subjected to red-eye flights and a litany of connecting flights, all to save the travel department money, while costing the traveler more time and impacting his or her performance. Examples of damage to systems abound in Deming's *Out of the Crisis*<sup>2</sup> and *The New Economics*.<sup>3</sup>

Deming practitioner Rip Stauffer tells the following story:<sup>4</sup>

In a class I listened to two Six Sigma Black Belt students present projects. Each was from a different business unit within a company. Each business unit was its own profit and cost center. Each student proudly announced he could quantify six-figure cost savings from his project. The interesting thing was, each was saving cost by eliminating services currently "bought" from the other's business unit. I then asked the stupid questions:

- "So, how much will the project cost, altogether?"
- "We estimate about \$30,000."
- "About \$25,000."
- "So, what's the net for the company as a whole?"

Of course, since the "gains" were a wash, the net was a \$55,000 loss. Until that moment, I was the only one aware of that fact.

Deming commented that in an orchestra the players are not there to play solos as prima donnas, each one trying to catch the ear of the listener. They are there to support each other.

## The Theory

More important than examples, though, is theory. Systems thinkers have a theory. Thinkers focus on grander interactions, with the theory provided by Deming's system of profound knowledge, which includes:

- **Appreciation for a system**—interactions, system interrelations and flow.
- **Knowledge about variation**—statistical knowledge, control charting, variation and factual data.
- **Theory of knowledge**—knowledge built on theory, with theory providing the ability to predict how people learn.
- **Psychology**—understanding people, their interactions and intrinsic motivation.

Systems thinking is characterized by long-term vision and achievement of long-term profits. Systems thinking both requires and allows organizations to focus on the long term.

Both Deming and Ackoff encourage a focus on the life cycle costs of products, not just the purchase price. Ackoff has said a system is made up of a set of parts. Each part can affect the system, each part has an affect on other parts, and every possible subgroup of parts can affect the system. However, no part can have an independent effect on the whole.

Any attempt to understand a system by dissecting its components will lead to the system's losing its essential properties. As Ackoff says, you write; your hand does not write; if you don't believe that, cut it off and see what it can do.

A system must have an aim, and development and statement of the aim allow the people within the system to understand what they are working toward. There is a focus on win-win and success of a whole endeavor. Cooperation between components is developed and valued because it will lead to overall success for the system and all its components. For example, applying this methodology, including statistics, management leadership and employee involvement, to the Hanford Washington Department of Energy cleanup site led to a 72% reduction in rate of employee injuries.<sup>5</sup>

Systems thinkers use many disciplines and tools, from psychology and human behavior through flowcharts and statistics. Pushing the envelope and thinking outside the box come naturally as systems thinkers focus on grander and continually improving interactions.

## Value of Control Charts

Statistical thinking and knowledge of variation are integrated within systems thinking. Control charts (statistical process control) separate out short-term fluctuations from important system changes. An individual datum is not treated in a vacuum (were we above goal or below last month's point?).

Instead, this month's number is evaluated on the control chart with knowledge of past data and variation. Control charts are not simply used to maintain the status quo but to spot where improvement is needed. Then, goals for improvement are based upon achieving statistically significant results, not lucky short-term results. Finally, the achievement of the significant improvement closes the loop and resets the system for the start of another cycle.

Control charting is not just a tool, but a way of thinking, a framework for viewing the system. This use of statistics creates a positive feedback loop, allowing the organization to achieve massive improvements.

There are many other methods and techniques that are not systems thinking. I think they result in degradation of the system. These techniques include focus on specific numerical targets. Any person, with sufficient pressure, can achieve any given number through distortion, shifting costs to others or outright falsification.

What is the cost to the overall system as individuals each manipulate the system to achieve "their" number? Short-term thinking prevails, and the organization bounces from crisis to crisis. Fire-fighting is rewarded, even as the next fire starts burning. The usual focus on the quarterly profit statement is an incentive to manipulate numbers to make the current quarter look good at the expense of the future.

Without systems thinking, fear often permeates an organization. Fear cripples many of this nation's companies and individuals—fear of the next quarterly statement, fear of the next performance appraisal,

fear of absorbing blame from the next failure, fear of the next layoff, fear of diminishing resources, fear of not making the next target number.

Systems thinkers instead work to achieve win-win results, to build the pie bigger rather than fight over the pieces. Knowledge of psychology and human behavior allow system thinkers to work to develop intrinsic motivation. Employees develop pride and joy in their work instead of merely chasing the latest bonus or trying to avoid blame and the latest retribution.

## Cooperation and Interaction

Cooperation is the goal for system thinking interactions, be they between people and people or equipment and people. Since you cannot separate an individual component from its performance appraisals, individual bonuses (pay for performance) are minimized. Group effort is encouraged, with participation by the workforce and leadership by management.

The key points of systems thinking are:

- More attention to interactions than components.
- More knowledge of statistical variation than of discreet numbers.
- More long-term than short-term focus.
- More cooperation than fear, blame and internal competition.

This integrated theory of managing for improvement allows individuals working within a system to achieve far more than the individuals themselves could have achieved. Long-term success and a winning environment for all will come with systems thinking practice.

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## INTERNET RESOURCES

- Balestracci, Davis, [www.dbharmony.com](http://www.dbharmony.com).  
 Crawford-Mason, Clare, [www.managementwisdom.com](http://www.managementwisdom.com).

Deming Electronic Network, <http://deming.ces.clemson.edu/pub/den/index.html>.

Deming Institute, [www.deming.org](http://www.deming.org).

Hanford Trending Primer, [www.hanford.gov/safety/vpp/trend.htm](http://www.hanford.gov/safety/vpp/trend.htm).

In2InThinking, <http://in2in.org>.

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## Complexity Theory Simplifies Choices

by **Duke Okes**

Most business management and improvement methodologies provide somewhat finite structures to achieve success. For example, guidance for business excellence according to the Malcolm Baldrige National Quality Award criteria consists of seven major categories and more than 90 specific items to be addressed. ISO 9001 contains five major elements that together contain more than 130 "shalls." Six Sigma improvement projects are carried out according to the define-measure-analyze-improve-control process. W. Edwards Deming provided 14 detailed points necessary for management to transform organizations.

A less prescriptive approach for helping members of organizations identify and carry out improvement opportunities is to provide a framework for looking at the organization in new ways. Peter Senge's learning organization is such an example, emphasizing the need to find ways to embed continual transformational learning into key business and personal processes and activities.<sup>1</sup>

Over the last two decades complexity theory has also taken on a similar role. At a macro level, the increased interconnections enabled by computers, communication technologies and global business networks have created a more complex economic

and social environment. At the micro level, the increase in knowledge work means more of what goes on within organizations involves the complex social interaction of many people, rather than simply the manipulation of physical assets.

In effect, organizations are now seen as complex adaptive social systems that operate technical systems and processes to meet customer requirements.<sup>2</sup>

### Characteristics

In the past, organizations were thought of as machines in which cause and effect relationships were linear and unidirectional. In complex adaptive systems, cause and effect relationships are bidirectional and nonlinear, meaning a small change can have large effects.

In addition, while machines have designers, the power of complex systems is that they are self-organizing. The result is while performance is less predictable in advance, it is often much greater than could be achieved through top-down control.

This does not mean complex systems operate without guidance. Agents (whether individuals or groups) in such systems operate according to a small number of rules. Such rules are intended to communicate the general direction required while allowing considerable autonomy in how to get there.

The system can therefore more flexibly respond to input from the environment in which it operates. Maximum performance of the system is achieved when it operates at the edge of chaos.<sup>3</sup> An example of the edge of chaos in the physical world might be the thin line automotive road rally drivers maintain between forward progress of the auto and loss of control.

Performance of most systems, however, is measured according to multiple criteria. So while a complex system might perform well on one variable, it is unlikely to be able to maximize performance for all criteria. Paying attention to the environment is required to detect when a shift in priorities has occurred.

### From Theory to Practice

So, how can complexity theory be used to manage and improve organizational performance? Here are five ways:

1. **Ensure the mission, values, goals and priorities of the system are clear.** Keep in mind an

## QUALITY MANAGEMENT

organization actually consists of nested complex systems and subsystems (for example, business processes, departments and individuals), indicating these issues need to be addressed at each level of the system. And rather than doing this through a one-way, top-down approach to strategy, a process such as *hoshin* planning can be used. *Hoshin* planning uses an iterative process to develop and deploy strategic direction and methods for achieving it, involving all levels of the organization to ensure alignment.

- 2. Provide only as much control as necessary for each system.** An assembly line or bank deposit may need to be managed according to very specific guidelines, while considerable flexibility may need to be allowed for hotel desk clerks when they deal with customer complaints. Unlike its predecessor, the 2000 edition of ISO 9001 recognizes this, noting the extent of process documentation will vary from organization to organization and process to process. The more a process relies on communication and cognition, the more complex it is likely to be.
- 3. Ensure there is sufficient feedback from the environment so the system can detect and act on signals indicating a need for change.** Examples of feedback are customer satisfaction data, competitive analysis and benchmarking. Also keep in mind that since there are levels of systems within an organization, mechanisms to provide internal feedback between subsystems should also be provided.
- 4. Monitor a wide range of system performance metrics to understand more fully how well the organization is performing.** A balanced scorecard better enables consideration of trade-offs relative to business decisions and can also be applied at the departmental and process levels.
- 5. Make many small changes rather than major disruptions to improve system performance.** Of course, what is considered small will be different depending on the size of the system or subsystem. But changes that can be managed by the system do not create problems for customers and ensure continuous incremental learning will be more successful over the long term. Many small changes made in the general

direction in which the organization wants to move will cause a tipping point to eventually be reached. Beyond this point the organization will have achieved a transformation in capabilities.<sup>4</sup>

As these examples indicate, many existing quality management practices support the view of organizations as complex adaptive systems. When and how each should be applied depends on the type of organization and its current situation. An expert is someone who has the ability to match the correct tool to the situation, and complexity theory provides a lens through which such decisions can more easily be made.

### Other Important Issues

Because the interaction between agents, systems or subsystems creates the power of complex systems, there are additional opportunities for helping such systems perform better. These include paying attention to the entities themselves (agents and subsystems, for example) and the interaction among them.

Since what emerges from the system is largely a function of the synergy created by the differences between agents, systems and subsystems, one way to manage performance is to ensure there are sufficient differences between them.

Of course, too much difference may be as bad as too little, but differences in thinking processes (for example, as measured by the Myers-Briggs Type Indicator), learning styles, the focus of educational pursuits and organizational experiences mean a wider variety of ideas can be synthesized. This indicates personnel selection and development, as well as organizational design, are important for helping a complex adaptive system perform better.

A focus on the interaction between agents, systems and subsystems means paying attention to communications. The amount, direction, type and quality of the information flow are indications of how much leverage is currently being gained from that interaction.

Improvement might include adding to the communication when it is insufficient, creating better channels through which the communication can occur (such as through movement of personnel or by providing electronic tools) or reducing communication when it is creating overload.

And finally, given that organizations are soci-



eties, the importance of language is paramount. Changing the language used can slowly but surely have an impact on the perspective the organization (agents and subsystems) has about itself, its environment and its possibilities. For example, do your employees say they work for, or with, their managers? Are suppliers called vendors or partners? These are very subtle differences, but most certainly shape the interactions between players.

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1. Peter Senge, *The Fifth Discipline: The Art & Practice of the Learning Organization*, Currency/Doubleday, 1994.
2. David Nadler and Michael Tushman, "A Congruence Model for Diagnosing Organizational Behavior" in D.A. Kolb, I.M. Rubin and J.S. Osland, eds., *The Organizational Behavior Reader*, fifth edition, Prentice Hall, 1991, pp. 544-561.
3. R.T. Pascale, "Surfing the Edge of Chaos," *Sloan Management Review*, Vol. 40, No. 3, pp. 83-94.a
4. Jerry Kurtyka, "The Science of Complexity: A New Way To View Industry Change," *Journal of Retail Banking Services*, Vol. 21, No. 2, pp. 51-58.

#### ADDITIONAL RESOURCES

The application of complexity theory to organizational management is still in the early stages of translation of theory to practice and currently tends to rely more on metaphors than tools. However, for those interested in learning more, following are some recommended sources on complexity theory and its application to organizations:

- Axelrod, Robert, and Michael Cohen, *Harnessing Complexity: Organizational Implications of a Scientific Frontier*, Free Press, 1999.
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## ◎ Baldrige: It's Easy, Free and It Works

by **Dale Crownover**

Why do so many people consider the Malcolm Baldrige National Quality Award criteria difficult? What's so hard about expecting an organization to have some sort of idea of what its people are doing, how they are doing it and why they are doing it?

What might be considered really hard is learning how to manage opportunities for improvements instead of managing known strengths. So before you commit to a management tool, think about it for about seven days. Whatever you do though, start. Start any day you care to. If you don't start, it won't get easier.

### Monday—Baldrige Strategic Planning Category

Baldrige doesn't have the strategic answers; it has the strategic questions. As my colleague John Darrouzet says, these are more significant because they're the commonsense ones you want to answer. If you consider the questions in "25 Simple Questions for Comparing Tools" (p. 38), you'll quickly see Baldrige lines up the questions that help you continuously improve.

**Today:** Compare the tools' questions. Do they enhance your insights into the way you conduct your business?

### Tuesday—Baldrige Customer And Market Focus Category

When choosing what quality tool to use, remember you are now the customer. If Baldrige is right for you, you'll come around to it eventually. You may "date" other management tools for a while, but over time the strengths of the Baldrige "proposal" will be undeniable to those who get it.

1. Baldrige has similar criteria for business, healthcare, education and, soon, nonprofit organizations.
2. Organizations in countries all over the world have adopted the *Baldrige Criteria for Performance Excellence*.<sup>1</sup>

(continued on p. 40)

# 25 Simple Questions For Comparing Tools

Choosing a management tool to take your company to another level is kind of like getting married. You know what dating's like and you've had your fill. Now it's time to talk commitment—lifelong—if you want.

Here's a list of 25 questions to help you evaluate each of the tools featured in this *Quality Progress* issue. References in parentheses are to sections of the Baldrige criteria (BC). The underlying question is, does the tool you are considering help you plan-do-check-act (PDCA)? If not, why would you use it?

## Plan

1. **Does the tool encourage you to plan what you want your company to do to take it to the next level? Does it encourage you to:**
  2. Write down what your company's business environment is and what your significant relationships with customers, suppliers and other partners are? (BC Preface 1)
  3. Write down your company's competitive environment, your key strategic challenges and what your system for performance improvement is? (BC Preface 2)
  4. Write down how your company establishes its strategic objectives to enhance its competitive position, overall performance and future success? (BC 2.1)

## Do

5. **Does the tool encourage you to do what you want to do to take your company to the next level? Does it encourage you to:**
  6. Find out what your customers want so your products and services stay current? (BC 3.1)
  7. Build relationships with customers, increase

customer loyalty and determine customer satisfaction? (BC 3.2)

8. Identify and manage significant processes that create customer value and achieve business success and growth? (BC 6.1)
9. Manage support processes? (BC 6.2)
10. Work in a way that enables your company and employees to achieve high performance? (BC 5.1)
11. Build employee knowledge, skills and capabilities? (BC 5.2)
12. Maintain a work environment and employee support climate that contribute to the well-being, satisfaction and motivation of all employees? (BC 5.3)
13. Establish links between your plans and what you do so you can measure, analyze, align and improve your performance data and information at all levels and in all areas of your organization? (BC 4.1)
14. Ensure the quality and availability of linked data and information so you can mine databases with timely reports? (BC 4.2)



## Check

**15. Does the tool encourage you to check what you've done to take your company to the next level? Does it encourage you to:**

16. Chart your most significant customer focused results (past, current, projected, showing trends), including customer satisfaction and customer perceived value, segmented by appropriate customer groups and markets and including appropriate comparative data and benchmarks? (BC 7.1)
17. Chart your most significant product and service performance results (past, current, projected, showing trends), segmented by product groups, customer groups and markets with appropriate comparative data and benchmarks? (BC 7.2)
18. Chart your company's key financial and marketplace performance results (past, current, projected, showing trends) by appropriate market segments with appropriate comparative data and benchmarks? (BC 7.3)
19. Chart your most significant human resource results (past, current, projected, showing trends), including work system performance and employee learning, development, well-being and satisfaction, segmented to address the appropriate diversity of your workforce and the different types and categories of employees with appropriate comparative data and benchmarks? (BC 7.4)
20. Chart your most significant operational per-

formance results (past, current, projected, showing trends) that contribute to the achievement of company effectiveness, segmented by appropriate product groups and markets with appropriate comparative data and benchmarks? (BC 7.5)

21. Chart your most significant governance and social responsibility results (past, current, projected, showing trends), including evidence of fiscal accountability, ethical behavior, legal compliance and organizational citizenship, segmented by appropriate business units, with appropriate comparative data and benchmarks? (BC 7.6)

## Act

**22. Does the tool encourage you to act to take your company to the next level after planning, doing and checking? Does it encourage you to:**

23. Govern and guide your company, with senior leaders reviewing the performance you have charted and checked? (BC 1.1)
24. Fulfill your company's responsibilities to the public, ensure ethical behavior and practice good citizenship? (BC 1.2)
25. Convert strategic objectives based on your checking of the results of your plan into future action plans, linked to charted results that contain significant performance measures and indicators, thus starting PDCA again and thereby providing continuous improvement? (BC 2.2)

(continued from p. 37)

3. You can start at the state level (“baby Baldrige” some people call it) and work your way up if you prefer not to start at the national level.
4. The criteria are continually being updated.
5. The criteria are free.

**Today:** Compare the other quality methodologies with what the Baldrige program offers in depth, breadth and opportunities.

### **Wednesday—Baldrige Measurement, Analysis and Knowledge Management Category**

Most organizations already have what the Baldrige criteria ask for but do not have a systems perspective for their approaches or deployment. With the right software, currently being developed by software engineers for Texas Nameplate, many

**“By asking and answering the Baldrige questions, you can better judge your past actions, choose your present courses of action and decide your future.”**

more organizations will be able to operate the Baldrige way, whether or not they apply for the award.

**Today:** Compare all the different management tools to see if they require you to change the way you operate instead of simply reviewing and improving it, as is the case with Baldrige.

### **Thursday—Baldrige Human Resources Focus Category**

Certification is not the objective with Baldrige. Learning is. Winning the award is not the objective. Winning employee and customer loyalty is.

If you have a lot of money, maybe you can afford management by flavor-of-the-month training. Maybe you can afford to go out and hire somebody to implement the tool you’ve chosen. Maybe that someone else will understand the tool and your

operations better than any of your own people do. Maybe these other programs won’t even be around years from now.

But if you don’t have a lot of money, make things simple. Baldrige allows you to get as involved as you want. If you don’t want to learn about the criteria on your own, become a Baldrige examiner and learn from the experts very affordably.

**Today:** Compare the commonsense Baldrige criteria approach to learning to those of the other programs.

### **Friday—Baldrige Process Management Category**

Baldrige doesn’t process people better than other tools do. Instead, people process better with Baldrige.

While many organizations have some quality tools (ISO 9000 and total quality management, for example), these tools seemed to us at Texas Nameplate like having other people telling us how they could help us run our business. Baldrige doesn’t do that. It doesn’t process you. You do your processes, and then link them from a Baldrige, systems perspective.

Darrouzet says, “By faithfully asking and answering the Baldrige questions, you can better judge your past actions, choose your present courses of action and decide your future.”

**Today:** Compare what processes it takes to succeed with each quality management tool.

### **Saturday—Baldrige Results Category**

In some ways, the worst thing you can do is win the Baldrige Award because then you no longer get examiner feedback.

When I was a kid working at my dad’s company, businesses raised their prices to make more money or to provide raises for employees. But many companies rather quickly learned they could not raise prices of their products or services unless they raised their standards.

Unfortunately, some businesses still haven’t figured that out. That’s why organizations such as ASQ will always be needed. Baldrige, too, provides organizations the opportunity to figure out these little things we all think we know but don’t do. As a result, Baldrige recipients—whether business is good or bad—always know where they stand and



why. They disagree with the “it’s the economy, stupid” outlook.

**Today:** Compare what you’ll do with the feedback you’ll get from the different quality management tools.

## Sunday—Baldrige Leadership Category

In a strange way, it’s more important to figure out what you *want* to use rather than what you think you *need* to use. If the system doesn’t bring out the passion in your gut, how do you expect to continue working with it over the long haul, for 10 years or even generations?

As Darrouzet and I described in our book, *Take It to the Next Level*,<sup>2</sup> we found passion for our business renewed through Baldrige more than any other system. The Baldrige criteria help you lead people.

I was recently asked to accept a leadership role with the Quality Texas Foundation. I quickly recognized that after 10 years of working with the criteria, I really knew no other way to lead than by using Texas Nameplate’s Baldrige core values:

- **Strategic planning** that looks at the future from an agile, systems perspective.
- **Performance excellence** driven by our customers, markets and love of family.
- **Wise practices** that use measurements, analysis and knowledge to help take courses of action based on facts, judgments and decision making processes.
- **Resources** that value our people first and offer both personal and organizational learning.
- **Process management** that welcomes and nurtures innovation.
- **Charted results** that track, project and compare results valuable to stakeholders.
- **Visionary leadership** that encourages purposeful work, public responsibility and good citizenship.

Based on those values, I suggested the Quality Texas Foundation start by answering the Baldrige questions. We did, and now we know we have a way to go. Our goal is to apply for the Baldrige Award in the not-for-profit category. It will certainly take us more than seven days to do it, just as it would with any tool.

**Today:** Compare all the various tools and ask yourself whether you, personally, are willing to

commit to a program. And if you will lead in commitment, will you have a community of peers on whom you can rely for good counsel?

### ACKNOWLEDGMENT

John Darrouzet, Baldrige examiner and vice president and general counsel of Texas Nameplate Co., assisted in writing this article.

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2. Dale Crownover, with Linda Bush and John Darrouzet, *Take It to the Next Level*, Next Level Press, 1998.

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## ● An Integrated Approach System

by **Tom Kubiak**

Over the last 20 years or so, many quality tools, techniques, strategies or approaches have come and gone.

Those of us who have been serving in quality during this time have seen the management of our respective organizations reach out and grab quality fads as if in search of a holy grail that will drive them to greatness. In a few years, one fad is out, and a new one is in.

This reminds me of what W. Edwards Deming would say about tampering with a system. Tampering creates variation. Changing quality approaches frequently causes an organization to lose momentum and backslide. This often leaves a bad taste and nothing but disdain for an effective approach that was poorly implemented.

Since about 1980, busy quality professionals have been implementing a wide variety of approaches, such as quality circles, statistical process control (SPC), ISO 9000, reengineering,

benchmarking, balanced scorecard, Malcolm Baldrige National Quality Award criteria, Six Sigma and lean manufacturing. These quality approaches are not entirely independent. When used in an integrated manner, they can build a high performance organization.

### ISO 9000

ISO 9000, in essence, represents the fundamental concepts and framework necessary for an effective, basic quality management system. Today thousands of organizations worldwide are registered as having a quality system compliant with ISO 9000, which was first introduced in 1987. Does this mean their product or service quality has improved? The answer is both yes and no, as you will see.

## The key to gauging both the performance and health of an organization and its processes lies with its selection and use of metrics.

The flexibility built into the ISO 9000 standards makes them more than suitable for any organization that delivers tangible products and services. Simply put, ISO 9000 asks an organization to document what it does and to adhere to that documentation.

If the processes an organization follows are bad or not suitable for the products and services, ISO 9000 will not improve quality. It will, however, provide a consistent basis for performing the required work. Consistency means stable variation and process predictability, key objectives of Six Sigma, which I'll discuss later.

### Baldrige Criteria

The Baldrige Award, implemented through its criteria for performance excellence, is a holistic, integrated set of criteria that address best business

practices identified by experts in the field.

Businesses or organizations in manufacturing, service, education and healthcare apply for this annual award by completing a self-assessment document defined by rigorous rules and questions that must be addressed. A team of examiners reviews these self-assessments.

Each Baldrige applicant receives a comprehensive feedback report that includes an executive summary and detailed lists of strengths and areas for improvement. The feedback report provides the applicant with objective, nonprescriptive and actionable information to improve its organization. Although provided at a high level, the feedback points out key or critical gaps in meeting the intent of the criteria.

The strength of the award lies with its comprehensiveness in four areas:

1. **The seven criteria categories** (see "Baldrige: It's Easy, Free and It Works," p. 37).
2. **Core values and concepts**, including visionary leadership, customer driven excellence, organizational and personal learning, valuing employees and partners, agility, focus on the future, managing for innovation, management by fact, social responsibility, focus on results and creating value, and systems perspective. An autopsy of any successful organization will show these values at the foundation. They characterize the organization and are part of its DNA.
3. **A scoring system** predicated on the premise that results flow from effective approaches systematically deployed. In essence, results happen through planned cause and effect relationships. Anything else is a recipe for disaster.
4. **Refinements of processes** in which processes are reviewed and improved, with cycles of improvement being triggered either through the occurrence of specific events or the passage of time.

### Six Sigma and Lean

Six Sigma was introduced by Motorola in the early 1980s and served as that company's foundation for driving breakthrough improvement. Though there were some early adopters of Six Sigma in the mid-1990s, such as General Electric and Honeywell, it wasn't until the late 1990s that Six Sigma began surfacing in other companies. By

2000, the demand for Black Belts (BBs) and Master Black Belts (MBBs), cornerstone roles in Six Sigma, started sweeping the globe.

Opinions on what Six Sigma is can differ:

- **Philosophy**—The philosophical perspective views all work as processes that can be defined, measured, analyzed, improved and controlled (DMAIC). Processes require inputs and produce outputs. If you control the inputs, you will control the outputs. This is generally expressed as the  $y = f(x)$  concept.
- **Set of tools**—Six Sigma as a set of tools includes all the qualitative and quantitative techniques used by the Six Sigma expert to drive process improvement. A few such tools include SPC, control charts, failure mode and effects analysis and process mapping. There is probably little agreement among Six Sigma professionals as to what constitutes the tool set.
- **Methodology**—This view of Six Sigma recognizes the underlying and rigorous approach known as DMAIC. DMAIC defines the steps a Six Sigma practitioner is expected to follow, starting with identifying the problem and ending with the implementation of long-lasting solutions. While DMAIC is not the only Six Sigma methodology in use, it is certainly the most widely adopted and recognized.
- **Metrics**—In simple terms, Six Sigma quality performance means 3.4 defects per million opportunities (accounting for a 1.5-sigma shift in the mean). Yes, I know about the on-going debate regarding the validity of the 1.5-sigma shift, but for the sake of practicality and to facilitate further discussion, let's accept Six Sigma as a metric in these terms.

Six Sigma is a fact based, data-driven philosophy of improvement that values defect prevention over defect detection. It drives customer satisfaction and bottom-line results by reducing variation and waste, thereby promoting a competitive advantage. It applies anywhere variation and waste exist, and every employee should be involved.

At this point, some readers (Six Sigma purists) will be quick to say, "You're not just talking about Six Sigma; you're talking about lean too." Yes, I am! Today, the demarcation between Six Sigma and lean has blurred. With greater frequency, we are hearing about concepts such as lean sigma, because

process improvement requires aspects of both approaches to drive positive results.

Six Sigma focuses on reducing process variation and enhancing process control, while lean (sometimes known as lean manufacturing) drives out waste (nonvalue added) and promotes work standardization and flow. Six Sigma practitioners should be well-versed in the fundamental concepts of each.

Many organizations have jumped on the Six Sigma bandwagon. Search [www.careerbuilder.com](http://www.careerbuilder.com), [www.monster.com](http://www.monster.com), or ASQ's own job search website and you will quickly see hundreds, if not thousands, of postings for qualified BBs and MBBs across the world.

Some organizations see Six Sigma as a panacea. As we continue, we will see how Six Sigma, supplemented with other approaches, will help organizations achieve increasingly higher levels of performance.

## Balanced Scorecard

The key to gauging both the performance and health of an organization and its processes lies with its selection and use of metrics. A well-designed set of metrics provides a meaningful framework for measuring performance both vertically and horizontally. Not only are the metrics linked vertically and horizontally, but they are also balanced to provide different perspectives such as:

- **Customer**—The voice of the customer is not the organization's interpretation of what the customer is saying. The customer perspective looks at how the customer is made satisfied or made unsatisfied. The voice of the customer is heard through surveys, focus groups and a wide variety of other listening posts.
- **Employee**—Again, this is not the organization's interpretation of what the employee is saying. It is obtained in manners similar to those used to obtain the customer perspective.
- **Supplier**—This metric perspective is often overlooked or relegated to an organizational level lower than senior management. In many organizations, this component represents a significant dollar percentage of revenue.
- **Organization**—This component is internally focused and measures how efficiently and effectively an organization delivers its products or services. It can be divided into two



subcomponents: predictive and operational.

The predictive subcomponent includes measures of processes in the customer’s line of sight (if these metrics are moving in the desired direction, the organization should be able to predict customer satisfaction). For example, if on-time delivery and the quality of the products and services (both the results of internal processes) are high when measured from the organizational point of view, it is reasonable to predict or correlate this with a high level of customer satisfaction.

Conversely, the operational subcomponent includes measures of processes invisible to the customer, such as productivity, inventory turnover, shrinkage and machine downtime. The customer neither sees nor cares how well an organization performs in these areas. Often organizations will confuse predictive and operational metrics or confuse predictive and

customer satisfaction measures. This can lead to a false sense of security and inaction.

- **Financial**—This perspective includes the typical financial measures or ratios often reported on a balance sheet, profit and loss statement or annual report. Senior management can easily become obsessed with this perspective, almost to the exclusion of the others that truly drive cost.

In simplest terms, manage and improve processes associated with the customer, employee, supplier and organizational perspectives, and the financial perspective will improve accordingly. Conceptually, this is analogous to the Six Sigma  $y = f(x)$  equation that relates process inputs to process outputs.

Managing solely by the financial perspective can easily break the other measurement perspectives. For example, applying pressure to an organization to reduce costs will often lead

**TABLE 2** Metric Scorecard Scenarios

Scenario	Metric characteristics	Organizational characteristics
One	<ul style="list-style-type: none"> <li>• Current.</li> <li>• Actionable.</li> <li>• Visible.</li> <li>• Balanced.</li> <li>• Customer focused.</li> <li>• Well-understood by employees.</li> <li>• In-process measures are prevalent.</li> <li>• Owned.</li> <li>• Leading benchmarks.</li> </ul>	<ul style="list-style-type: none"> <li>• Profitable.</li> <li>• Likely a leader in its industry.</li> <li>• Baldrige core values are visible throughout.</li> <li>• Benchmarks best practices regardless of the industry.</li> <li>• Process improvement is a way of life.</li> <li>• Statistical significance triggers action.</li> </ul>
Two	<ul style="list-style-type: none"> <li>• Out-of-date by more than one reporting period.</li> <li>• Drives activity just prior to executive-level reviews.</li> <li>• Balanced means looking at different financial statistics.</li> <li>• Highly visible when the senior staff visits.</li> <li>• Confusing to most employees.</li> <li>• Metrics are limited to those easy to measure.</li> <li>• End of process metrics dominate, with just a light peppering of in-process metrics.</li> <li>• Goals are set independent of performance or capability.</li> </ul>	<ul style="list-style-type: none"> <li>• Mediocrity reigns.</li> <li>• Prides itself on being not too bad.</li> <li>• Accountability is weak and not easily traceable to an individual or position.</li> <li>• Benchmarking is limited to other internal organizations or within its own industry or business sector.</li> <li>• There is no good time for improvement.</li> <li>• Reaction is based on one data point.</li> </ul>
Three	<ul style="list-style-type: none"> <li>• Always out-of-date.</li> <li>• Few and far between.</li> <li>• Gamed to promote self-preservation.</li> <li>• Invisible, even if available.</li> <li>• Benchmarking is nonexistent.</li> <li>• Goals are nonexistent.</li> </ul>	<ul style="list-style-type: none"> <li>• Bankruptcy is imminent.</li> <li>• Accountability, what accountability?</li> <li>• Employee turnover is high and morale is low.</li> <li>• Probably in the midst of being acquired by a scenario one organization.</li> </ul>



**TABLE 3** Key Linkages Among Quality Approaches

Balanced scorecard	Baldrige criteria	Six Sigma/lean	ISO 9000
<ul style="list-style-type: none"> <li>• Focuses on measuring an organization from a holistic, integrated perspective.</li> <li>• Metrics are linked vertically and horizontally across Baldrige categories.</li> <li>• The five perspectives link tightly to Baldrige category 4.0 (measurement, analysis and knowledge management) and category 7.0 (business results).</li> <li>• Ties to Baldrige core value of management by fact.</li> </ul>	<ul style="list-style-type: none"> <li>• Organization viewed as an integrated system of strategies and processes encompassing the concepts of the balanced scorecard, Six Sigma/lean and ISO 9000.</li> <li>• Provides an overall assessment of strengths and areas for improvement.</li> <li>• Serves as an overarching umbrella for managing an organization.</li> <li>• Predicated upon cycles of process improvement.</li> </ul>	<ul style="list-style-type: none"> <li>• Provides traction for translating Baldrige areas for improvement into strengths.</li> <li>• Reduces process variation, cycle time and waste.</li> <li>• Drives improvement in balanced scorecard metrics.</li> <li>• Creates an agile, learning organization—a Baldrige core value.</li> </ul>	<ul style="list-style-type: none"> <li>• Creates process stability and paves the way for Six Sigma/lean.</li> <li>• Is tightly linked to Baldrige category 6.0 (process management).</li> <li>• Calls for process improvement, a key to driving higher Baldrige scores.</li> <li>• Integrates more Baldrige concepts in the 2000 revision.</li> </ul>

to process shortcuts, wider process variation and longer cycle times. This cost reduction pressure is likely to be accompanied by the removal of people—usually the only element holding broken processes together. Subsequently, process performance is compromised and moves in an undesirable direction.

Organizations that utilize a balanced metrics scorecard concept usually distinguish themselves from those who don't. Walk into any organization, ask for its metrics scorecard and you will see one of the three scenarios shown in Table 2.

I hope it is clear implementation of a balanced scorecard can be a powerful approach for aligning and focusing an organization on its objectives.

### Fitting It All Together

The various quality approaches are not independent of one another but can work in a mutually supporting and integrated manner. It is not necessary to abandon one for another. Table 3 allows us to step back and view the key linkages among balanced scorecard, Baldrige criteria, Six Sigma and lean, and ISO 9000.

It can be said that:

- Baldrige provides integration.
- Balanced scorecard gauges progress.
- Six Sigma and lean drive improvement.
- ISO 9000 focuses on basics.

It is not necessary or productive to leap from fad to fad as so many organizations have done. Take the time to gain a deeper understanding of each approach. When thoroughly understood and implemented properly, each approach brings a unique set of perspectives and insights for driving organizational excellence.

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### Please comment

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